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

February 10, 2014

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

SUBJECT: THREE MILE ISLAND STATION, UNIT 1 – NRC INTEGRATED INSPECTION REPORT 5000289/2013005

Dear Mr. Pacilio:

On December 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Three Mile Island, Unit 1 (TMI) facility. The enclosed inspection report documents the inspection results, which were discussed on January 24, 2014 with Mr. Rick Libra, TMI Site Vice President, and other members of your staff.

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

This report documents two NRC-identified finding of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as NCVs, consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Three Mile Island. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at Three Mile Island.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to IMC 0310. Cross-cutting

aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

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 the 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).

Sincerely,

/RA/

William A. Cook, Acting Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos.: 50-289
License Nos.: DPR-50

Enclosure: Inspection Report 05000289/2013005
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-289
License No:	DPR-50
Report No:	05000289/2013005
Licensee:	Exelon Generation Company
Facility:	Three Mile Island Station, Unit 1
Location:	Middletown, PA 17057
Dates:	October 1 through December 31, 2013
Inspectors:	D. Werkheiser, Senior Resident Inspector, Division of Reactor Projects (DRP) J. Heinly, Resident Inspector, DRP J. Furia, Senior Health Physicist, Division of Reactor Safety (DRS) H. Gray, Senior Reactor Inspector, DRS T. Moslak, Health Physicist, DRS K. Young, Senior Reactor Inspector, DRS
Approved by:	William Cook, Acting Chief Projects Branch 6 Division of Reactor Projects (DRP)

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SUMMARY

IR 05000289/2013005, 10/01/2013-12/31/2013; Three Mile Island, Unit 1, Refueling Activities, Surveillance Testing.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified two findings of very low safety significance (Green), which were NCVs. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated June 7, 2012. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

Cornerstone: Barrier Integrity

- Green. The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, for Exelon's failure to establish an adequate program that leak tested components penetrating the primary containment pressure boundary. Specifically, Exelon failed to implement leak rate testing of the reactor building (RB) normal closed loop cooling piping to verify piping integrity to support its containment isolation function. As a result, on November 10, 2013, engineering personnel identified an inoperable containment isolation boundary due to a degraded RB closed cooling piping condition. Exelon documented this issue in issue report (IR) 1598590 and took corrective actions to revise the Appendix J test program and address the missed leak rate surveillance test.

  This finding is more than minor because it is associated with the Barrier Performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical barriers, as designed, protect the public from radionuclide releases caused by accidents or events. Specifically, Exelon failed to perform leak rate testing of the RB normal closed loop cooling piping and failed to identify the degraded piping condition that impacted the containment isolation function. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding did not represent an actual open pathway in the physical integrity of the reactor containment isolation system nor did it involve an actual reduction in function of hydrogen recombiners for the reactor containment therefore, the finding was of very low safety significance (Green). The finding was not assigned a cross-cutting aspect because the most significant causal factor of the finding was the failure to implement leak rate testing since 1991 and was not indicative of current plant performance. (Section 1R22)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green non-cited violation of Technical Specification 6.8.1 for Exelon's failure to implement procedure requirements governing storage of equipment in Class 1 structures. Specifically, Exelon stored unsecured material, one (1) roll of plastic sheeting and three (3) plastic sheets, in the Reactor Building (RB) during power operations,

contrary to Exelon Procedure 1015, “Equipment Storage Inside Class 1 Buildings.” This resulted in unsecured material in a location that had the potential, during a large break loss of coolant accident, to be transported to and adversely impact the performance of the emergency core cooling system (ECCS) suction sump. Exelon documented the issue in their corrective action program under issue report (IR) 1577437 and took immediate corrective actions to remove the unsecured plastic from the RB.

This finding is more than minor because it is associated with the availability and reliability attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the unsecured plastic had the potential to impact the reliability and availability of the ECCS recirculation suction flow path, due to the potential increased debris loading. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process for Findings At-Power,” Exhibit 2, and determined this finding is very low safety significance (Green) because the degraded condition is a design deficiency that affects system operability, but did not represent an actual loss of function of a system; did not represent an actual loss of function of a single train or two separate trains for greater than its technical specification allowed outage time and did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significant. The finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Exelon did not take adequate corrective actions to address the cause of improperly staged material in the RB (IR 1577100), resulting in a subsequent recurrence of improper staging of additional material in the RB identified by the inspectors (IR 1577437). [P.1(d)]. (Section 1R20)

Other Findings

A violation of very low safety significance that was identified by Exelon was reviewed by the inspectors. Corrective actions taken by Exelon have been entered into Exelon’s corrective action program. This violation and its corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

TMI Unit 1 began the inspection period at 100 percent power. On October 23, 2013, operators reduced power to approximately 85 percent to respond to an unplanned closure of the No. 2 main turbine control valve. The valve was repaired and the unit returned to 100 percent power on October 24, 2013. Operators commenced a unit shut down on October 27, 2013 from 100 percent power for a planned refueling and maintenance outage (T1R20) that began on October 28, 2013. The station reached refueling operations condition on November 4, 2013. Following the completion of refueling and maintenance activities, operators commenced a reactor startup on November 25, 2013. Operators returned the unit to 100 percent power on November 28, 2013.

On December 4, 2013, the operators reduced the unit to approximately 73 percent and secured the 'B' reactor coolant pump based on indications of an oil leak from the reactor coolant pump's upper motor bearing lube oil piping system. On December 5, 2013, the unit was reduced to 27 percent to repair the lube oil piping leak. The leak was repaired and the 'B' reactor coolant pump restarted on December 6, 2013. Operators returned the unit to 100 percent power on December 7, 2013 and the unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Exelon's readiness for the onset of seasonal low temperatures. The review focused on the emergency diesel generators fire protection equipment and borated water storage tank piping. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. (Documents reviewed for each section of this inspection report are listed in the Attachment.)

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On October 7, 2013, the inspectors performed an inspection of the site preparations for a tornado watch and the resultant high wind and rain impact. The inspectors reviewed abnormal operating procedures, interviewed operators, and performed extensive plant walk downs to confirm the adequacy of the licensee's risk mitigation actions in preparation for the storm. In addition, the inspectors independently reviewed the planned and emergent work activities scheduled during the storm to ensure the availability and reliability of safety equipment. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. The resident inspectors maintained site coverage during the storm and continually monitored plant and weather conditions to ensure abnormal conditions and deficiencies were promptly identified and appropriately addressed commensurate with their safety significance.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Reactor coolant collection system line-up during plant cooldown and depressurization, on October 30, 2013
- 'A' station battery after battery discharge test, on November 1, 2013
- 'A' train safety-related power bus (ES power) line-up, on November 4, 2013
- Decay heat removal system line-up prior to core reload, on November 13, 2013

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

b. Findings

No findings were identified.

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

a. Inspection Scope

During the week of December 16, 2013, the inspectors performed a complete system walkdown of accessible portions of the nuclear service closed cooling water system (NSCCW) to verify the existing equipment line-up was correct and appropriate for current plant conditions. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related issue reports (IRs) and work orders to ensure Exelon appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 samples)

a. Inspection Scope

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

- 1S switchgear room (CB-FA-2B), on October 23, 2013
- Hydrogen bank storage area (H2 Banks), on October 7, 2013
- Emergency feedwater pump [EF-P-1] area (IB-FZ-2), on October 10, 2013
- Reactor building ‘A’ and ‘B’ D-ring areas (RB-FZ-OLE, RB-FZ-OLD), on November 19, 2013
- Waste gas decay tanks area (AB-FZ-8), on December 30, 2013

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to potential flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including cable vault E-11 East and West and E-17, containing safety-related power cables, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the 2B decay closed heat exchanger [DC-C-2B] to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Exelon's commitments to NRC Generic Letter 89-13. The inspectors observed actual performance tests for the heat exchanger and reviewed the results of previous inspections of the heat exchanger. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Exelon initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R08 In-service Inspection (71111.08 - 1 sample)

a. Inspection Scope

From November 4 -15, 2013, the inspectors conducted an inspection and review of Exelon staff implementation of in-service inspection (ISI) program activities for monitoring degradation of the reactor coolant system boundary, risk significant piping

and components, and containment systems during the TMI Unit 1 20th refueling outage (1R20). The sample selection for this inspection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation would result in a significant increase in risk. The inspectors observed in-process non-destructive examinations (NDE), reviewed documentation, and interviewed Exelon personnel to verify that the NDE activities performed as part of the fourth interval, first period, of the Unit 1 ISI program were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2004 Edition, with no Addenda.

Non-destructive Examination and Welding Activities

The inspectors performed direct observation of NDE activities in process and reviewed documentation of non-destructive examinations listed below. Activities included review of liquid penetrant testing (PT), ultrasonic testing (UT), and visual testing (VT).

The inspectors reviewed certifications of the NDE technicians performing the examinations and verified that the inspections were performed in accordance with approved NDE procedures and industry guidance. The inspectors verified that the test results were reviewed and evaluated by certified Level III NDE personnel and that the parameters used in the test were in accordance with the limitations, precautions and prerequisites specified in the test procedure.

ASME Code Required Examinations

- Observation of automated UT, utilizing the phased-array technique, volumetric examinations of three 28-inch diameter reactor coolant system (RCS) reactor coolant pump discharge dissimilar metal (DM) welds (RC-122BM, RC-155BM, RC-160BM)
- Observation of manual UT of three 24-inch diameter main steam line elbow welds (MS002, MS003, and MS004L)
- Observation of automated UT of the reactor vessel upper head penetrations
- Record review of PT data reports of 10-inch diameter pressurizer surge line (RC-T-2) in preparation for a freeze seal, as part of a repair process
- Observation of Eddy Current Testing (ECT) of the steam generator tubes
- Observation of VT of containment liner and interior/exterior penetration coatings
- Observation of VT and performance lift testing of one horizontal containment building tendon (H62-26)
- Record review of remote VT of exterior surface of the reactor vessel head

Other Augmented or Industry Initiative Examinations

- Record review of manual UT, utilizing the phased-array technique, 2-inch diameter reactor coolant system (RCS) drain line elbow-to-pipe weld (RC-0289) per the requirements of MRP-146, “Managing Thermal Fatigue in Normally Stagnant Non-Isolable RCS Branch Lines”

Repair/Replacement Activities Including Welding Activities

- The inspectors reviewed activities associated with the weld overlay of the 2.5-inch diameter RCS letdown nozzle (MU394BM/MU395BM) under work order (WO) C2028856. The area to be overlaid consisted of the nozzle and nozzle-to-pipe DM

weld located on the 'C' cold leg. The inspectors verified that welding and applicable NDE activities were performed in accordance with approved procedures and ASME code requirements. The inspectors reviewed the weld procedures and weld operator qualifications, and verified that the overlay met the acceptance requirements per the design drawings.

- The inspectors also reviewed activities associated with the replacement of the lower and middle pressurizer heater bundles. The inspectors discussed the replacement design details with the project manager. The inspectors reviewed the weld procedures and welder qualifications, and verified that welding and applicable NDE activities were performed in accordance with approved procedures and ASME code requirements. The replacement was performed under work orders C2029535 and C2029536.

Pressurized Water Reactor (PWR) Vessel Upper Head Penetration Inspection Activities

The inspectors verified that the reactor vessel upper head penetration J-groove weld examinations were performed in accordance with requirements of 10 CFR 50.55a and ASME Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads," to ensure the structural integrity of the reactor vessel head pressure boundary. The inspectors also observed portions of the remote bare metal visual examination of the exterior surface of the reactor vessel upper head to verify that no boric acid leakage or wastage had been observed.

Boric Acid Corrosion Control (BACC) Inspection Activities

During the plant shutdown process, the NRC resident inspectors observed the boric acid leakage identification process. The ISI inspectors reviewed the BACC program, which is performed in accordance with Exelon procedures, and discussed the program requirements with the boric acid program owner. The inspectors reviewed photographic inspection records of each identified boric acid leakage location and discussed the mitigation and evaluation plans. The inspectors reviewed a sample of condition reports for evaluation and disposition within Exelon's Corrective Action Program (CAP). Samples selected were based on component function, significance of leakage, and location where direct leakage or impingement on adjacent locations could cause degradation of safety system function.

Once-Through Steam Generator (OTSG) Tube Inspection Activities

The inspectors directly observed a sample of the OTSG eddy current tube examinations, which consisted of full length bobbin inspection of 100% of all active tubes in each of the two OTSGs; array probe examination of the peripheral tubes, tubes with previous tube-to-tube wear (TTW), and tubes with greater than 10% tube-to-tube support sheet (TTS) wear; and rotating pancake coil of special interest tubes. The inspectors compared the scope of the ECT activities with the potential degradation mechanisms documented in the 1R20 Steam Generator Degradation Assessment Report. The inspectors noted three tubes (No. 48-118, 49-118, and 49-119) that went from 0% wear to greater than 40% through-wall TTS wear in one operating cycle had received additional review by Exelon. NRC inspectors participated in phone conference discussions on November 8 and 18, 2013, with Exelon personnel and NRC headquarters staff from the Steam

Generator Tube Integrity and Chemical Engineering Branch to discuss the OTSG tube inspection results at TMI, Unit 1. These discussions were subsequently summarized in a memorandum available in the NRC's Agencywide Documents Access and Management System (ADAMS), Accession No. ML14015A356, dated January 24, 2014.

The inspectors verified that the OTSG eddy current tube examinations were performed in accordance with TMI Unit 1 Technical Specifications, ASME code requirements, and the TMI Steam Generator Program. The inspectors reviewed the OTSG tube eddy current test results and verified that in-situ pressure testing of one tube (No. 49-119) was required. This tube passed its in-situ pressure test requirement, and after testing, was plugged and stabilized full-length. No primary-to-secondary leakage occurred over the operating cycle. The inspectors verified that the OTSG tube examination screening criteria was in accordance with the Electric Power Research Institute (EPRI) Steam Generator Guidelines and flaw sizing was in accordance with the EPRI examination technique specification sheet.

Identification and Resolution of Problems

The inspectors reviewed a sample of TMI corrective action reports, which identified NDE indications, deficiencies, and other non-conforming conditions since the previous refueling outage and during the current outage. The inspectors verified that non-conforming conditions were properly identified, characterized, evaluated, and that corrective actions were identified and entered into the CAP for resolution.

b. Findings

No findings of significance were identified.

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

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

a. Inspection Scope

The inspectors observed control room operations at power during normal surveillance testing on October 11, 2013. The inspectors observed licensed operators performance to verify that procedure use, crew communications, and coordination of activities between work groups met the criteria specified in Exelon's OP-AA-1, "Conduct of Operations," Revision 000. In addition, the inspectors verified that licensee supervision and management were adequately engaged in plant operations oversight and appropriately assessed control room operator performance and similarly met established expectations and standards.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on November 19, 2013 in preparation for TMI startup following 1R20 under the Just-In-Time training program. The inspectors evaluated operator performance during the simulated plant heat-up and pressurization and reactor startup and verified completion of risk significant operator actions, including the use of possible entries into abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

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

- 'A' emergency diesel generator jacket water coolant pump [EG-P-7A] seal leakage during diesel run on November 5, 2013, as documented in issue report (IR) 1581323
- Severe flood mitigation equipment failure and (a)(1) performance improvement plan, on December 12, 2013

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Exelon personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the

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

- Review of 1R20 Shutdown Safety Plan, on October 17, 2013
- Review of station risk during pre-outage cable conduit installation related to WO C2029233, Loss of Phase Detection Project, on October 23, 2013
- Yellow station risk during main turbine control valve #2 recovery, on October 24, 2013
- Yellow shutdown risk profile in plant condition 4, on October 29, 2013
- Station risk determination regarding make-up and letdown pathway during plant cool down and depressurization, on October 30, 2013
- Station risk and controls during reactor coolant system reduced inventory and mid-loop operation timeframes, November 1 – 3, 2013

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

a. Inspection Scope

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

- Reactor building emergency core cooling sump with respect to unsecured material identified in reactor building as documented in IRs 1577100 and 1577437, on October 28, 2013
- 1A safety-related battery post-discharge test data issues documented in IR 1579892, on November 1, 2013
- Reactor vessel internal vent valve issues identified during exercise and inspection as documented in IR 1583961, on November 12, 2013
- Core flood valves, CF-V-19A & 19B, failure to close during testing as documented in IR 1592429, on December 3, 2013

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

properly controlled by Exelon. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

a. Inspection Scope

The inspectors evaluated the following permanent modifications:

- Replacement of the middle and lower pressurizer heater bundles per Engineering Change Request (ECR) 12-00441
- Loss of phase detection and digital protective relay logic to the 'A' and 'B' auxiliary transformers per ECR 12-00240 and WO C2029233

The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including observing the physical replacement of the pressurizer heaters and the installation of the auxiliary transformer relay logic panels. The inspectors also reviewed revisions to operating and test procedures.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 samples)

a. Inspection Scope

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

- OP-TM-541-237, 'B' engineered safeguards actuation system tests for replacement of relay 63T/RC4A under ECR 13-00040, on October 25, 2013
- Nuclear river water cross-connect valve (NR-V-2 & 7) replacements, on November 11, 2013
- 'A' decay river pipe replacement at intake structure, on November 14, 2013
- 1303-4.16, 'A' emergency diesel generator surveillance test after replacement of the jacket water coolant pump (EG-P-7A), on November 14, 2013

- Adjustments to main steam safety valve heated post gaps under WO R2195579-03, on November 15, 2013

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the TMI maintenance and refueling outage (1R20), which was conducted October 28 through November 24, 2013. The inspectors reviewed Exelon's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown evolutions and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of the reactor building / primary containment to verify debris had not been left which could potentially block the emergency core cooling system suction strainer, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

Introduction. The inspectors identified a Green non-cited violation (NCV) of TS 6.8.1 for Exelon's failure to implement procedure requirements governing storage of equipment in Class 1 structures. Specifically, Exelon stored unsecured material, one (1) roll of plastic and three (3) plastic sheets, in the reactor building (RB) during power operations, contrary to Exelon Procedure 1015, "Equipment Storage Inside Class 1 Buildings." This

resulted in unsecured material in a location that had the potential, during a large break loss of coolant accident (LOCA), to be transported to and adversely impact the performance of the emergency core cooling system (ECCS) sump suction strainer.

Description. On October 26, 2013, TMI personnel performed a RB walkdown, in part, to review equipment staged in the RB for the upcoming refueling outage scheduled to commence on October 28, 2013. During the walkdown, the licensee identified items staged in the RB contrary to Exelon Procedure 1015, "Equipment Storage Inside Class 1 Buildings." Specifically, they identified ladders, power panels, lights and various equipment pre-staged in a manner not prescribed in Exelon Procedure 1015 and the equipment storage data sheet (ESDS) developed to specify allowed storage configurations of the material placed in the RB during at-power operations. Contrary to the ESDS, the equipment was not covered in Teflon plastic and secured with zip ties to prevent unqualified coatings from delaminating and reaching the sump during a postulated design basis LOCA. The plastic covering material and zip ties were also not to be left unsecured for potential migration or impact on the performance of the ECCS sump suction strainer. The licensee documented this condition in IR 1577100 and took prompt corrective actions to wrap the material in plastic and secure the plastic with zip ties.

On October 28, 2013, TMI performed a planned shutdown for the T1R20 refueling outage. Following the unit shutdown, the inspectors performed a hot shutdown inspection and walkdown inside the RB. During the hot shutdown inspection, the inspectors identified that Exelon had stored unsecured plastic sheathing material inside the RB. Specifically, three large loose pieces of plastic and the remaining roll of plastic were left unsecured in the RB during power operations. The inspectors reviewed TMI's assumptions for pipe break locations for the design basis LOCA analysis and determined that a postulated large pipe break could result in the transport (to the ECCS sump) of any unsecured, improperly stored materials in close proximity to the pipe break. The inspectors determined that the identified plastic material was stored contrary to the ESDS requirements. Exelon documented this issue in the CAP under IR 1577437 and took immediate corrective actions to remove the unsecured plastic from the RB.

Analysis. The inspectors determined that Exelon's failure to properly store material in the RB was a performance deficiency which was within the licensee's ability to foresee and prevent. Specifically, Exelon stored unsecured material in the reactor building that had the potential to adversely impact the performance of the ECCS sump suction strainer. This finding is more than minor because it was associated with the availability and reliability attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the unsecured plastic had the potential to adversely impact the ECCS by compromising the recirculation suction flow path due to blockage of the suction strainer. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, and determined this finding screened as very low safety significance (Green) because the degraded condition: was not a design deficiency; did not represent an actual loss of function of a system; did not represent an actual loss of function of a single train or two separate trains for greater than its technical specification allowed outage time; and did not represent an actual loss of function of one

or more non-technical specification trains of equipment designated as high safety significant.

The finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Exelon did not take adequate corrective actions on October 26, 2013 to address the cause of improperly staged materials in the RB (IR 1577100) and to prevent recurrence. This resulted in additional materials being left or subsequently staged inappropriately in the RB between October 26 and 28, 2013 during power operations and being identified by the inspectors upon entry into the RB following unit shutdown [P.1(d)].

Enforcement. TS 6.8.1 requires that written procedures shall be established, implemented and maintained as recommended by Regulatory Guide 1.33, Revision 2. Specifically, Exelon Procedure 1015, "Equipment Storage Inside Class 1 Buildings," requires, in part, an equipment storage data sheet be developed and implemented for storage of material in the RB. Contrary to the above, on October 28, 2013, the resident inspectors identified that Exelon had stored unsecured material in the RB. The licensee took prompt action to remove the identified material and conduct an extent of condition walkdown to identify any additional unsecured material, none was found. Because this finding is of very low safety significance and was entered into the licensee's corrective action program (IR 1577437), this violation is being treated as an NCV, consistent with the Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000289/2013005-01, Improper Storage of Material in Reactor Building)**

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

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

- 1302-5.31B, 4160V 'D' and 'E' Bus Loss of Voltage Relay System Calibration, on October 3, 2013
- OP-TM-541-236,IST of NR-P-1C and NSRW Valves During Single Pump Operations, on October 11, 2013
- ST 1303-11.3, Surveillance Test and Set Main Steam Safety Valves, on October 22-23, 2013 (in-service test)
- MA-TM-244-222, Penetration 421 and 422 LLRT of RB-V-2A and RB-V-7, on November 20, 2013 (containment isolation valve)
- OP-TM-220-252, Primary to Secondary Leak Rate Determination, on December 12, 2013 (leak rate test)

b. Finding

Introduction. The inspectors identified a Green NCV of 10 CFR 50 Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, for Exelon's failure to establish an adequate program that leak tested components penetrating the primary containment pressure boundary. Specifically, Exelon failed to implement leak rate testing of the RB normal cooling closed loop piping system to verify piping integrity of a system that penetrates containment, following the discovery of a degraded RB normal closed cooling piping condition.

Description. On November 10, 2013, during a routine RB walkdown, TMI engineers identified a leak on a flanged joint in the 'B' RB normal closed cooling system piping. The closed loop piping is one of the two containment isolation boundaries required to maintain containment integrity during design basis accidents. During maintenance efforts to repair the leaking flange joint, the technicians discovered the piping had significant through-wall degradation from the extended exposure to flange leakage. The licensee entered the issue into the CAP under IR 1583483 and took actions to cut and cap the degraded pipe section. The licensee determined that the structural integrity of the piping was compromised and challenged the piping's containment isolation function. However, since TMI was in cold shutdown at the time of discovery, the containment isolation function was not required by TSs.

IR 1583483 documented the degraded condition, operability determination and summarized actions to repair the degraded condition. During inspector follow-up, it was identified that the IR did not initiate actions to evaluate the cause of the degradation and review the 10 CFR 50, Appendix J, program requirements to ensure it was adequate to identify degraded containment isolation boundaries.

10 CFR 50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, requires the licensee to establish and implement a testing program to verify the leak-tight integrity of the primary reactor containment and systems and components which penetrate containment. The inspectors identified that Exelon's 10 CFR 50, Appendix J, program did not include leak rate testing of the RB normal cooling closed-loop cooling piping system. Specifically, Appendix J requires, as described in ANSI N271-1979, that closed systems in containment shall be leak tested. Regulatory Guide (RG) 1.141, Containment Isolation Provisions for Fluid Systems, provides guidance for an acceptable test program and states, in part, that inspection of the closed-loop piping, pressurized to greater than containment design pressure, would be acceptable for monitoring piping integrity. The inspectors identified that neither leak rate testing nor visual inspection of the piping at design pressure were performed on the RB normal cooling closed-loop piping system since 1991. Furthermore, TMI's FSAR states that the RB normal cooling "…closed system piping inside containment is included in the Local Leak Rate Test Program to verify closed system integrity." Exelon documented this issue in IR 1598590 and took corrective actions to revise the Appendix J test program and to address the missed leak rate surveillance test.

Analysis. The inspectors determined that Exelon's failure to implement an adequate leak rate test on the RB normal cooling closed loop piping system, to verify piping and containment integrity, was contrary to 10 CFR 50, Appendix J, and a performance deficiency that was reasonably within Exelon's ability to foresee and correct. This performance deficiency was associated with the barrier integrity cornerstone. This

finding is more than minor because it was associated with the Barrier Performance attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding in accordance with IMC 0609, Appendix A, "Exhibit 3 - Barrier Integrity Screening Questions," and determined that the finding did not represent an actual open pathway in the physical integrity of reactor containment isolation system nor did it involve an actual reduction in function of hydrogen recombiners in the reactor containment; therefore, the finding screened as very low safety significance (Green).

The finding was not assigned a cross-cutting aspect because the most significant causal factor of the finding was the failure to implement leak rate testing since 1991. Therefore, this performance deficiency was not indicative of current plant performance.

Enforcement. 10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," requires that the licensee establish and implement a testing program to verify the leak-tight integrity of the primary reactor containment and systems and components which penetrate containment. Contrary to the above, Exelon did not perform leak rate testing on the RB normal cooling closed loop piping system to ensure system and containment integrity between 1991 and November 2013 when identified by the resident inspectors. Exelon performed immediate corrective actions to repair the degraded containment boundary and to revise the Appendix J testing program. Because the violation was of very low safety significance and it was entered into the licensee's corrective action program under IR 1598590, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000289/2013005-2, Failure to Perform Leak Rate Testing on Containment Boundary Piping**)

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine Exelon emergency drill on December 10, 2013, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, technical support center, and operations support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Exelon staff in order to evaluate Exelon's critique and to verify whether the Exelon staff was properly identifying weaknesses and entering them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

During the period of November 4 - 8, 2013, the inspectors evaluated Exelon's performance in assessing the radiological hazards and the effectiveness of radiological controls implemented during the 1R20 refueling outage.

The inspectors used the requirements in 10 CFR Part 20 and guidance in Regulatory Guide (RG) 8.38 "Control of Access to High and Very High Radiation areas for Nuclear Plants", TSs, and the Exelon procedures, as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the 2013 TMI performance indicators for the occupational exposure cornerstone, and relevant IRs related to occupational radiation safety initiated since the last inspection, to identify performance trends and repetitive problem areas.

Radiological Hazards Assessment and Work Coverage

The inspectors identified work performed in radiological controlled areas in the RB and evaluated the licensee's assessment of the radiological hazards during refueling outage conditions. The inspectors evaluated applicable radiation surveys, exposure control evaluations, electronic dosimeter dose/dose rate alarm set points, and radiation work permits (RWP) associated with these areas, to determine if the exposure controls were adequate. Specific work activities evaluated included: control rod drive mechanism (CRDM) replacement (RWP 1-13-533), in-core detector replacement (RWP 1-13-534), pressurizer heater replacement (RWP 1-13-537), and scaffolding construction (RWP 1-13-505). For these tasks, the inspectors observed the temporary shielding and contamination controls installed at the job site, various aspects of the jobs-in-progress, and discussed the radiological controls with the licensee staff.

The inspectors reviewed the air sample records for samples taken from inside the steam generators, in preparation for installing nozzle dams (RWP 1-13-602), to determine if the samples collected were representative of the breathing air zone and analyzed/recorded in accordance with established procedures. During tours of the RB, the inspectors evaluated whether the continuous air monitors were strategically located to assure that potential airborne contamination could be promptly identified and that the monitors were located in low background areas.

During walk downs of the RB, the inspectors evaluated dose rates in selected areas to confirm the accuracy of survey maps, and to verify that very high radiation areas (VHRAs) locked high radiation areas (LHRAs) were properly posted, secured and access properly controlled.

At the main radiation protection control point, the inspectors inventoried LHRA/VHRA keys to verify that all keys were properly maintained.

Additionally, the inspectors reviewed the RWPs developed for other work performed during 1R20, including temporary shielding installation, scaffolding construction, and various steam generator tasks. In particular, the inspectors reviewed the electronic dosimeter dose/dose rate alarm set points, stated on the RWP, to determine if the set points were consistent with the survey indications and plant policy.

Instructions to Workers

The inspectors observed RWP briefings to determine if workers, performing radiological significant tasks, were properly informed of electronic dosimeter alarm set points, low dose waiting areas, and work site radiological conditions. Jobs observed included cutting of in-core detectors (RWP 1-13-534), CRDM removal/packaging (RWP1-13-533), 1B-reactor coolant pump motor replacement (RWP 1-13-502), and defueling (RWP 1-13-514).

During tours of the RB, the inspectors determined that LHRAs and a VHRA had the appropriate postings and were secured. Additionally, the inspectors identified that low dose waiting areas were appropriately surveyed, identified, and used by personnel.

The inspectors evaluated the processes for identifying, posting, and controlling VHRA areas by reviewing survey maps, VHRA briefing forms, VHRA access logs, and the responsibilities of a VHRA controller. The inspectors also reviewed the verifications, authorizations, and posting actions required to down-post a VHRA.

The inspectors discussed with radiation protection supervision the procedural controls for accessing LHRAs and VHRAs and determined that no changes have been made to reduce the effectiveness and level of worker protection.

Contamination and Radioactive Material Control

During tours of the RB, the inspectors confirmed that contaminated materials were properly bagged, surveyed/labeled, and segregated from work areas. The inspectors observed workers and radiation protection technicians using contamination monitors to determine if they were properly monitoring themselves, tools and equipment when exiting the RCA.

Radiation Worker Performance

During job performance observations, the inspectors determined that workers complied with RWP requirements and were aware of radiological conditions at the work site. Additionally, the inspectors determined that radiation protection technicians were aware of RWP controls/limits applied to various tasks and provided positive control of workers to reduce the potential of unplanned exposure and personnel contaminations.

Problem Identification and Resolution

A review of Nuclear Oversight field observation reports, dose/dose rate alarm reports, personnel contamination event reports, personnel exposure investigation reports, and associated IRs, was conducted to determine if identified problems and negative performance trends were entered into the corrective action program and evaluated for

resolution. Also, the inspector reviewed these reports to determine if an observable pattern traceable to a similar cause was evident. Relevant IRs, associated with radiation protection access control, that were initiated between July - November 2013, were reviewed and discussed with the licensee staff to determine if follow-up activities were being conducted in an effective and timely manner, commensurate with their safety significance.

b. Findings

No findings were identified

2RS02 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

During the period November 4 - 8, 2013, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA) during the 1R20 refueling outage. The inspectors used the requirements in 10 CFR Part 20, RG 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be ALARA," RG 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposure ALARA," TSs, and Exelon procedures, as criteria for determining compliance.

a. Inspection Scope

Inspection Planning

The inspectors reviewed pertinent information regarding Exelon collective dose history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges for the 1R20 refueling outage. The inspectors reviewed the plant's three-year rolling average collective exposure, the 1R20 Source Term Reduction Plan, and the 5-Year Dose Excellence Plan.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures ALARA, which included a review of processes used to estimate and track exposures for specific work activities.

Radiological Work Planning

The inspectors selected the following work activities that had high estimated exposure for the refueling outage and evaluated the associated exposure controls for these work activities.

- Pressurizer heater replacement, RWP 1-13-537, ALARA Plan 13-021
- Scaffolding construction in the RB, RWP 1-13-505, ALARA Plan 13-020
- Control rod drive replacement, RWP 1-13-533, ALARA Plan13-016
- In-core detector replacement, RWP 1-13--534, ALARA Plan 13-015
- RC-P-1B motor replacement, RWP 1-13-532, ALARA Plan 13-014

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure reduction requirements. Additionally, the inspectors evaluated the ALARA work-in-progress reviews that assessed the effectiveness in limiting exposure for specific outage tasks. Included in this review were the Reactor Disassembly (AP 1-13-517) and

the Alloy 600 Letdown Weld Overlay (AP1-13-531) tasks whose actual exposure had reached the procedural threshold for an in-depth evaluation of the ALARA exposure controls.

The inspectors evaluated whether Exelon had identified appropriate dose reduction techniques, considered alternate dose reduction features, and estimated reasonable dose goals. The inspectors determined that Exelon's ALARA assessment had taken into account decreased worker efficiency when using respiratory protection. The inspectors assessed the integration of ALARA requirements into work procedures and RWP documents.

The inspectors compared the results achieved in reducing dose rates and controlling actual dose with the forecasted dose established in Exelon ALARA planning for these work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the RP group actual person-hours for the work activity, and evaluated the accuracy of these time estimates. The inspectors assessed the reasons for any inconsistencies between estimated and actual work activity doses.

The inspectors determined that lessons learned from past outages were applied during the 1R20 outage to effectively control the source term and reduce dose rates in various plant areas.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the assumptions and basis for the current operational and outage collective dose estimates and compared these estimates with the actual exposure accrued. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and for department and station collective dose goals.

The inspectors evaluated whether the licensee had established measures to track, trend, and reduce occupational doses for ongoing work activities. The inspectors evaluated the dose threshold criteria established to prompt additional reviews and implement additional ALARA planning and controls, by performing work-in-progress reviews when actual dose approached dose estimates.

The inspectors evaluated the licensee's method of adjusting exposure estimates, by reviewing station ALARA committee actions to evaluate unexpected changes in dose rate, job scope or emergent work when encountered. The inspectors assessed whether adjustments to exposure estimates were based on sound radiation protection and ALARA principles.

Source Term Reduction and Control

The inspectors reviewed the current status and historical trends for the TMI radiological source term. Through review of radiation surveys and interviews with the Radiation Protection Manager, the inspectors evaluated recent source term measurements and exposure control strategies. Specific strategies being employed by the licensee included operational controls to increase reactor coolant cleanup during shutdown, chemistry

controls, increased let-down flow, use of macro-porous resin, system flushes, and temporary shielding.

The inspectors assessed the effectiveness of temporary shielding by reviewing pre- and post-installation radiation survey data for shielding the pressurizer surge line, let-down piping, under vessel, in-core seal table, and steam generator drain lines.

Radiation Worker Performance

The inspectors observed radiation worker and RP technician performance during work activities being performed in radiation areas, airborne radioactivity areas, and HRAs. The inspectors determined that workers demonstrated the ALARA philosophy in practice.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's CAP. The inspectors assessed Exelon's process for applying operating experience to their plant.

b. Findings

No findings were identified.

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

a. Inspection Scope

During the period November 4 - 8, 2013, the inspectors evaluated whether in-plant airborne concentrations were being controlled consistent with ALARA principles. The inspectors used the requirements in 10 CFR Part 20, RG 8.25, "Air Sampling in the Workplace," and the licensee's procedures, as criteria for determining compliance.

Airborne Controls

The inspectors determined that for entries into the OTSGs for installing nozzle dams and eddy current test equipment, respiratory protection was used by the workers to limit inhalation of airborne radioactive material that may be present. For this task, the inspectors determined that a TEDE ALARA evaluation was performed, that workers were trained in using the equipment, and appropriately monitored. The inspectors reviewed air sampling records to confirm that airborne contamination was accurately determined at the job site.

During plant tours, the inspectors verified the operability and location of various continuous airborne monitors to assure that areas that were susceptible to airborne contamination were properly monitored. The inspectors confirmed that engineering controls (e.g. portable high efficiency particulate air ventilation units) were used at specific job sites to direct airborne contamination away from workers.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP. The inspectors assessed whether the corrective actions were appropriate for a selected sample of problems involving airborne radioactivity and were appropriately documented by the licensee.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

During the period November 4 - 8, 2013, the inspectors evaluated the processes and procedures implemented by the licensee to determine occupational dose. This was performed to determine if the Total Effective Dose Equivalent, resulting from external and internal exposure, was appropriately monitored and assessed. The inspectors used the requirements in 10 CFR Part 20 and the licensee's procedures, as criteria for determining compliance.

External Dose

During plant tours, the inspectors confirmed that detailed procedures were implemented associated with dosimeter use. The inspectors confirmed that dosimeters were appropriately worn by workers, on their body location receiving the highest dose rate.

The inspectors reviewed issue reports related to electronic dose and dose rate alarms received on electronic dosimetry to determine if the cause of the alarm was properly determined and that no performance indicator criteria was exceeded

The inspectors reviewed exposure records, for the ten highest exposed workers occurring in 2013 (through November 7, 2013) and electronic dosimeter alarm reports to verify that no regulatory criteria were exceeded and no performance indicator threshold was met.

Special Dosimetric Situations – Effective Dose Equivalent External (EDEX)

The inspectors reviewed the use of multi-dosimetry for personnel who were involved in cutting in-core cables, in which large dose gradients existed at the work site. The inspector reviewed the relevant procedure, discussed the placement and control of the worker's personnel dosimetry, and the tracking/documentation of personnel exposure.

Internal Dose

The inspectors reviewed the internal dose assessments and associated procedures for workers who had the potential to receive a committed effective dose equivalent dose (CEDE) of ≥10 millirem from the inhalation or ingestion of radioactive contamination during the refueling outage. Included in this review were the initial and follow-up whole body counts for the workers, a determination that the radionuclide library used for the counting system included the gamma-emitting radio-nuclides that exist at the site, and a review of the calculations used to make the dose assessment.

Declared Pregnant Workers

The inspectors assessed the program for controlling and restricting the dose to declared pregnant workers who had access to performing outage related activities. The inspectors reviewed the documentation for four (4) declared pregnant workers to determine if the worker's exposure was properly monitored and controlled.

Problem Identification and Resolution

The inspectors assessed whether problems associated with occupational dose assessment are being identified by the licensee at an appropriate threshold and are properly addressed for resolution in the licensee CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety

2RS08 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

During the week of September 30 - October 4, 2013, the inspector verified the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. This area was inspected to verify the effectiveness of these programs. The inspector used the requirements of 10 CFR Parts 20, 61, and 71, and 10 CFR Part 50 Appendix A - Criterion 63 - Monitoring Fuel and Waste Storage, and licensee procedures required by the TS/Process Control Program as criteria for determining compliance.

a. Inspection Scope

Inspection Planning

The inspector reviewed the solid radioactive waste system description in the Updated Final Safety Analysis Report (UFSAR), the Process Control Program (PCP), and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed.

The inspector reviewed the scope of quality assurance (QA) audits performed for this area since the last inspection. The inspector reviewed the results of the audits performed since the last inspection of this program and evaluated the adequacy of the licensee's corrective actions for issues identified during those audits.

Radioactive Material Storage

The inspector inspected areas where containers of radioactive waste were stored. The inspector verified that the radioactive materials storage areas were controlled and posted as appropriate.

The inspector verified that the licensee had established a process for monitoring the impact of long-term storage (e.g., build-up of any gases produced by waste decomposition, chemical reactions, container deformation, loss of container integrity, or re-release of free-flowing water) sufficient to identify potential unmonitored, unplanned releases, or nonconformance with waste disposal requirements. The inspector verified that there were no signs of swelling, leakage, or deformation.

Radioactive Waste System Walkdown

The inspector walked down accessible portions of liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions in the UFSAR, offsite dose calculation manual, and PCP.

The inspector identified radioactive waste processing equipment that was not operational and/or was abandoned in place, and verified that the licensee had established administrative and/or physical controls to ensure that the equipment would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure.

The inspector reviewed the adequacy of any changes made to the radioactive waste processing systems since the last inspection. The inspector verified that changes from what was described in the UFSAR were reviewed and documented.

The inspector identified processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers. The inspector verified that the waste stream mixing, sampling procedures, and methodology for waste concentration averaging were consistent with the PCP, and provided representative samples of the waste product for the purposes of waste classification.

For those systems that provide tank recirculation, the inspector verified that the tank recirculation procedure provided sufficient mixing.

The inspector verified that the licensee's PCP correctly described the current methods and procedures for dewatering waste.

Waste Characterization and Classification

The inspector identified radioactive waste streams, and verified that the licensee's radiochemical sample analysis results were sufficient to support radioactive waste characterization. The inspector verified that the licensee's use of scaling factors and

calculations to account for difficult-to-measure radionuclides was technically sound and based on current analyses.

For the waste streams identified above, the inspector verified that changes to plant operational parameters were taken into account to (1) maintain the validity of the waste stream composition data between the annual or biennial sample analysis update, and (2) verified that waste shipments continued to meet applicable requirements.

The inspector verified that the licensee had established and maintained an adequate Quality Assurance (QA) program to ensure compliance with applicable waste classification and characterization requirements.

Shipment Preparation

The inspector reviewed the records of shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness. The inspector verified that the requirements of applicable transport cask certificate of compliance had been met. The inspector verified that the receiving licensee was authorized to receive the shipment packages. On October 1, 2013, the inspector observed the shipment of radioactive material (RS-13-145-1) to a vendor facility.

The inspector determined that the shippers were knowledgeable of the shipping regulations and that shipping personnel demonstrated adequate skills to accomplish the package preparation requirements for public transport. The inspector verified that the licensee's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

Shipping Records

The inspector identified non-excepted package shipment records and verified that the shipping documents indicated the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and UN (identification) number. The inspector verified that the shipment placarding was consistent with the information in the shipping documentation.

Identification and Resolution of Problems

The inspector verified that problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by the licensee at an appropriate threshold, were properly characterized, and were properly addressed for resolution in the licensee CAP. The inspector verified the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involved radioactive waste processing, handling, storage, and transportation. The licensee generated six condition reports to document material condition deficiencies identified during this inspection.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator (PI) Verification (71151)

.1 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspector reviewed implementation of the licensee's Occupational Exposure Control Effectiveness PI Program. Specifically, the inspector reviewed condition reports, and associated documents, for incidents involving LHRAs, VHRAs, and unplanned exposures, occurring over the past four calendar quarters, against the criteria specified in Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6, to verify that all occurrences that met the NEI criteria were identified and reported as performance indicators.

b. Findings

No findings were identified.

.2 RETS/ODCM Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspector reviewed relevant effluent release reports for the period October 1, 2012 through November 1, 2013, for issues related to the public radiation safety performance indicator, which measures radiological effluent release occurrences that exceed 1.5 mrem/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; or 5 mrad/quarter gamma air dose, 10 mrad/quarter beta air dose, and 7.5 mrad/quarter for organ dose for gaseous effluents.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 4 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive

equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended issue report screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Exelon outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Exelon's CAP database for the third and fourth quarters of 2013 to assess issue/action reports written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1).

b. Findings and Observations

No findings were identified.

The station has identified adverse trends in equipment operator, radiation protection outage, and configuration control performance. The inspectors reviewed the IR trends and determined that challenges regarding configuration control performance began during mid-fourth quarter at TMI, notwithstanding previously implemented corrective actions. The inspectors also noted a trend in issues not documented for station review, (e.g. IRs 1596096 and 1603883). Station management has taken action to enforce standards and has increased the number of in-field observations.

The inspectors discussed these issues with various station personnel, including station management. Station management acknowledged the issues, verified they were captured in the CAP and continues to re-emphasize worker performance fundamentals. The inspectors determined these corrective actions were appropriate.

The inspectors also noted a significant improvement in fire and flood protection awareness regarding work activities and risk management. Plant markings, training, and other corrective actions have been effective in correcting prior adverse trends in these areas.

.3 Annual Sample: Review of the Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control

room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds, as specified in TMI procedure OP-AA-102-103, "Operator Work-Around Program," Revision 3.

The inspectors reviewed Exelon's process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent Exelon self-assessments of the program. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that the issues reviewed did not adversely affect the capability of the operators to implement abnormal or emergency operating procedures. The inspectors also verified that Exelon entered operator workarounds and burdens into the CAP at an appropriate threshold and planned or implemented corrective actions commensurate with their safety significance.

.4 Annual Sample: Adverse Trends and Behaviors in Control of Transient Combustibles

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's common cause analysis (CCA), root cause evaluation (RCE) and corrective actions associated with IRs 1454611 and IR 1467002. IR 1454611 documented an increasing number of IRs being generated with regards to transient combustible controls and a need to perform a CCA for this adverse trend. IR 1467002 documented the need to perform a RCE to determine the root cause of adverse trends and behaviors in the control of transient combustibles and create corrective actions to correct the identified issues. The CCA and RCE identified the cause of the adverse trend to be general lack of sensitivity by the work force toward control of transient combustible requirements due to low awareness, understanding, and reinforcement of standards. Exelon's immediate corrective actions included conducting a site stand-down to identify this adverse trend to the work force. Additionally, Exelon reinforced the requirements for controlling materials in transient combustible free zones (TCFZ) and work cleanliness to site personnel, and briefed security shifts to be sensitive to controls of transient combustibles issues during their rounds. The Fire Marshall and Fire Programs Engineer performed additional tours of the plant to monitor potential issues regarding controls of transient combustible materials.

The inspectors assessed Exelon's problem identification threshold, causal analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspectors compared the actions taken to the requirements of Exelon's CAP, 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, and Exelon's approved fire protection program at TMI. In addition, the inspectors reviewed documentation associated with this issue,

including CCA, RCE, revised fire protection administrative procedures, training documents, and interviewed site fire protection personnel to assess the effectiveness of the implemented corrective actions to complete full resolution of the issue. The inspectors performed a walkdown of plant fire areas to assess if abnormal conditions existed.

b. Findings and Observations

No findings were identified.

The inspectors found that Exelon appropriately identified the root cause of the issue. The licensee determined the root cause to be management's failure to establish the correct standards, behaviors, and accountability required to address gaps previously identified in the transient combustible program. A contributing cause was determined to be management's failure to enforce proper storage of transient combustible material inside radiological controlled areas. This determination was made based, in part, on NRC and licensee-identified issues regarding the control of transient combustible materials. The identified causal factors led to the adverse trend in the control of transient combustible issues at the site.

Exelon's additional corrective actions included painting the floors of all TCFZs to help plant personnel identify those areas where transient combustibles should not be stored, develop and provide training for all site personnel, including operations, security, maintenance, and contractors, to ensure personnel were aware of and understood the requirements to control transient combustibles at the site, perform benchmarking to learn best practices of other stations, and establishing a performance indicator to monitor and track control of transient combustible issues. Additionally, the licensee revised administrative procedures and the 2-minute drill card to improve plant personnel's sensitivity to the control of transient combustibles. The licensee has plans to include a section on transient combustible requirements in their 2014 safety handbook. Effectiveness reviews for all aspects of the transient combustible controls program identified in the cause analyses are scheduled.

The inspectors determined Exelon's overall response to the issue was timely, commensurate with the safety significance and the actions taken and planned were reasonable to resolve the adverse trend in transient combustible control issues and to minimize recurrence.

.5 Annual Sample: Thermal Overload Constraints regarding Motor-Operated Valve Jogging

a. Inspection Scope

The inspectors performed an in-depth review of the corrective actions associated with an NRC-identified NCV (IR 1347306) regarding thermal overload (TOL) design for safety related motor-operated valves (MOVs). Specifically, the thermal overloads on certain safety-related MOVs could be challenged by excessive motor heat-up due to repetitive jogging of the valve. TOLs are designed to trip upon excessive motor heat-up to prevent damage to the actuator motor. The inspectors had previously identified that TMI's calculation did not address the capability of the TOL during repetitive jogging and could inhibit the operation of the valve during a design basis accident. The inspectors focused their review on a risk-significant sample of safety-related valves including the decay heat

injection valves, DH-V-4A/B, and make-up system high pressure injection valves, MU-V-16A/B/C/D.

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

b. Findings and Observations

No findings were identified.

The inspectors determined that Exelon had adequately captured the calculation deficiencies regarding TOL capability in the CAP. Specifically, Exelon addressed the capability of safety-related valves requiring repetitive jogging to meet their design function. Exelon appropriately performed a conservative calculation to support reasonable assurance of operability. The inspectors determined that Exelon had used sufficiently conservative values in the calculation to justify consecutive jogs of the safety-related valves. The inspectors validated that simulator and plant operational data, as well as emergency operational procedures, would reasonably be bounded by the calculation.

Exelon documented a long-term corrective action to conduct laboratory tests on the affected TOLs in a manner that represented expected plant conditions to validate the calculation. Furthermore, the test was to prove that sufficient margin existed in the TOLs such that the valve could be cycled indefinitely, given a 30-second cool down period between jogs. Exelon Power Labs completed a test on October 25, 2013. However, the test configuration did not incorporate a 30-second cool down, contrary to the expectations of station engineering. The data showed that the TOL would trip on the 4th consecutive jog of the valve. The inspectors identified that the operation of MOVs per TMI procedure OP-AA-103-105, "Limitorque Motor-Operated and Chainwheel-Operated Valve Operations," allows operators to jog the MOVs similar to the test configuration, which may trip the MOV TOLs. The inspectors noted that operations staff stated that the MOVs are not operated in this manner. Exelon entered the issue into the CAP under IR 1602025 and reinforced to plant operators that a cool-down period is required between valve jogs to prevent a TOL trip during MOV jogging. The inspectors concluded that procedure OP-AA-103-105 does not have sufficient operating guidelines to prevent MOV TOL trips, based on October 2013 TMI test data. The inspectors determined this is a minor violation because there is sufficient station guidance and reasonable assurance that the operators would provide a sufficient cool-down period between MOV jogs to prevent TOL trips. This determination is also based upon a review of training and actual operator performance. The inspectors noted that Exelon has scheduled a retest of the TOL under the desired conditions and has sufficient actions in place to incorporate the test data into design calculations and procedure guidelines.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples)

Plant Events

a. Inspection Scope

For the plant events listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Exelon made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR Parts 50.72 and 50.73. The inspectors reviewed Exelon's follow-up actions related to the events to assure that Exelon implemented appropriate corrective actions commensurate with their safety significance.

- Unplanned power reduction to 84 percent power in response to inadvertent closure of main turbine control valve #2 (TG-CV-2) from full power, on October 23, 2013
- Notification by Exelon of degraded primary coolant cold leg drain line pipe section (RC-289) identified during 1R20 and reported via Event Notification 49512, on November 8, 2013
- Unplanned power reduction to 73 percent and shutdown of the 'B' reactor coolant pump in response the a lube oil leak from the 'B' reactor coolant pump motor upper bearing piping system, on December 5, 2013

b. Findings

No findings were identified.

4OA5 Other Activities

Institute of Nuclear Power Operations (INPO) Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of TMI conducted in April 2013. The inspectors evaluated the report to ensure that NRC perspectives of Exelon's performance were consistent with any issues identified during the assessment. The inspectors also reviewed this report to determine whether INPO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Section 2RS08: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

On October 4, 2013, the inspectors debriefed the inspection results to Mr. M. Newcomer and other members of the staff. The Exelon staff acknowledged the inspection results. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

Sections 2RS01 thru 2RS04: Radiological Hazards Assessment, Exposure Controls, ALARA, In-Plant Airborne Radioactivity Control & Mitigation, and Occupational Dose Assessment

On November 8, 2013, the inspectors debriefed the inspection results to Mr. D. Divittore and other members of the staff. The Exelon staff acknowledged the inspection results. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

Quarterly Inspection Report Exit

On January 24, 2014, the inspectors presented the inspection results to Mr. Rick Libra, TMI Site Vice President, and other members of the TMI staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by Exelon and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

TMI License Condition 2.C.(4) and the Fire Hazards Analysis Report (FHAR) require administrative breaker position restrictions for Appendix R valves needed for safe shutdown, including reactor coolant pump #1 seal bypass valve (MU-V-38). TMI procedure AP-1038 is the implementing procedure for License Condition 2.C.(4) and the FHAR. On November 28, 2013, the licensee identified the breaker for MU-V-38 to be in the ON position contrary to the required OFF position. It was determined that the breaker was in the incorrect position for six (6) days of the seven (7) days allowed by the AP-1038 time clock. In that, compensatory measures and a risk assessment were not in place for this out-of-position breaker, in the event of a postulated fire and fire-induced spurious operation of MU-V-38, and the inspectors determined the issue was more than minor. The cause of the mispositioned breaker was determined by Exelon to be auxiliary operator distraction from multiple work activities and failure to restore the breaker to its expected position following post-maintenance testing during the fall refueling outage. Exelon entered this issue into their CAP as IR 1591314 and promptly positioned the breaker to the correct OFF position, including validation of the position of the remaining Appendix R breakers. The inspectors determined that the finding was of very low safety significance (Green) in accordance with IMC 0609, Appendix F, “Fire Protection Significance Determination Process,” based upon this Fire Prevention and Administrative Controls issue having a low degradation category.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Alvey	Manager, Chemistry
D. Atherholt	Manager, Regulatory Assurance
R. Campbell	Manager, Site Security
D. Divittore	Manager, Radiological Engineering
D. Ethridge	Outage Radiological Controls Coordinator
M. Fitzwater	Senior Regulatory Assurance Engineer
W. Harris	Corporate Health Physicist
R. Libra	Site Vice President
G. McCarty	Manager, RP Technical Support
R. Myers	Fire Marshall
G. Navratil	Engineer
M. Newcomer	Plant Manager
E. Parido	Senior Radiation Protection Technician
J. Piazza	Senior Manager, Design Engineering
B. Shumaker	Manager, Emergency Preparedness
C. Sinn	Shipper
G. Smith	Director, Maintenance
S. Taylor	Engineer, Fire Programs
M. Torborg	Manager, Programs Engineering
D. Trostle	Nuclear Oversight Assessor
D. Viola	Outage Control Center Coordinator, Radiation Protection
W. Vuxta	Manager, Rad Engineering
M. Willenbecher	Manager, Operations Support

Other Personnel

D. Dyckman	Nuclear Safety Specialist Pennsylvania Department of Environmental Protection Bureau of Radiation Protection
H. Anagnostopoulos	NRC Inspector/ Under-Instruction

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000289/2013005-01	NCV	Improper Storage of Material in Reactor Building (Section 1R20)
05000289/2013005-02	NCV	Failure to Perform Leak Rate Testing on Containment Boundary Piping (Section 1R22)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
WC-AA-107, Seasonal Readiness, Rev. 12
MA-TM-135-001, Fire System Anti-Freeze Loop Maintenance, Rev. 0
OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Rev. 10
OP-TM-108-111-1001, TMI Severe Weather and Site Inaccessibility, Rev. 7
OP-TM-AOP-004, Tornado/High Winds, Rev. 4

Miscellaneous
2012/2013 Winter Readiness Critique
2013 Winter Readiness AR List, October 7, 2013

WOs	R2213640	R2209799	R2210265	R2209522
ARs	A2314797	A2332873	A2333706	A2234911

Section 1R04: Equipment Alignment

Procedures
1107-1, Normal Electrical System, Rev. 93
1303-11.11, Station Battery Load Test, Rev. 36A
1301-4.6.1, 'A' Battery Weekly Surveillance, Rev. 10AB
OP-TM-541-000, Primary Component Cooling, Rev. 18
OP-TM-541-465, NR De-Ice Supply to Screen House Intake, Rev. 2
OP-TM-642-232, ES Train 'B' Emergency Sequence and Power Transfer Test, Rev. 5

Drawings
302-610, Nuclear Services Closed Cycle Cooling Water, Rev. 81
302-645, Decay Heat Flow Diagram, Rev. 39

Miscellaneous

IRs	1517666	1276222	990306	1517857	1518403	1520250
	1520348	1542811	1570739	1580931	1583273	1588855
	1592647	1594688	1595375	1597127		
WOs	R2195835	R2190955				

Section 1R05: Fire Protection

Procedures
1038, Administrative Controls-Fire Protection Program, Rev. 76
CC-AA-309-101, Engineering Technical Evaluations, Rev. 11
OP-MA-201-007, Fire Protection System Impairment Control, Rev. 6

Miscellaneous

WOs	R2178392	R2041221				
IR	1350598	1384290	1451843	1440726	1451850	1440823
	1440826	1440450				

Section 1R06: Flood Protection Measures

Procedures
MA-TM-153-001, Inspection and Maintenance of TMI-1 Electrical and Telephone Manholes, Rev. 3

Miscellaneous
WO R2219073 R2224759
IR 1566182 1567855 1580199*

* IR written based on NRC observation

Section 1R07: Heat Sink Performance

Procedures
ER-TM-340-1002, Guidance for Heat Exchanger Inspections and Cleaning at TMI, Rev. 3

Miscellaneous
Eddy Current Examination Report, Decay Heat Closed Cooler 2B, November 2013
WO R2010727 R2160565 R2155592
IR 15478516 1577895

Section 1R08: In-service Inspection

Procedures
03-1275284, Field Procedure for Remote Rolled Plugging Utilizing LAN SAP Box, Rev. 20
54-506-8477, IWE Containment Visual Exams, Rev. 4
54-ISI-130, Ultrasonic Examination of Ferritic Vessel Wels Greater than 2.0 Inches in Thickness, Rev. 47
54-ISI-400, Multifrequency Eddy Current Examination of Tubing, Rev. 21
54-ISI-603, Automated Ultrasonic Examination of RPV Closure Head Penetrations Containing Thermal Sleeves, Rev. 7
54-ISI-835, Ultrasonic Examination of Ferritic Piping Welds, Rev. 14
54-ISI-880, Encoded Phased Array Ultrasonic Examination of Dissimilar Metal Piping Welds, Rev. 0
54-PT-200, Color Contrast Solvent Removable Liquid Penetrant Examination of Components, Rev. 17
Examination Technique Specification Sheet 1, +Point Rotating Probe, Rev. 0
Examination Technique Specification Sheet 1, Bobbin Standard Probe, Rev. 0
Examination Technique Specification Sheet 2, Array/Bobbin Combo Probe, Rev. 0
MA-AA-736-610, Pre-freeze Surge Line, Rev. 7
Welding Procedure Specification WP1/8/43/F43OLTBSCa3, Rev. 3
Welding Procedure Specification WP8/43/F43AW1, Rev. 12
Welding Procedure Specification WP8/43/F43AW1/3, Rev. 0

Drawings
02-8059674E, TMI Letdown Nozzle Weld Overlay Implementation, Rev. 1
02-8068603D, Automated Pipe Scanner TMI Inspection Reactor Coolant Pump Discharge, Rev. 0
02-9165913B, TMI EDM-Array Flaw Cal Standard, Rev. 0
02-9173777E, TMI 1 REPHB Installation (Watlow Heater Internals), Rev. 3

308-946, Reactor Coolant System RCS Benchmark Elevations Schematic Layout, Rev. 5
5015610E, Specification Drawing for Replacement Reactor Vessel Closure Head TMI-1, Rev. 8
9165905B, TMI ASME-Wear Cal Standard, Rev. 0
ID-ISI-MS-004, Main Steam System Intermediate Building from Penetration No. 112 & 113, Rev. 1
ID-ISI-MU-004, Makeup & Purification System Letdown Cooler Inlet, Rev. 1
TMI1-0014, IWE Complete Rollout Outside Containment Concrete 0-180, Rev. 1
TMI1-0015, IWE Complete Rollout Outside Containment Concrete 180-360, Rev. 1

Action Requests / Issue Reports
01580462, Indication in elbow to pipe weld RC-0289
01580915, B OTSG eddy current wear indications
01581021, NDE PT indications on RC-T-2 surge line
01581602, B OTSG higher than normal tube support plate wear
01581684, Stainless steel buttering for middle PHB is not uniform
01581714, Pressurizer shell prior corrosion
01582228, Confirmed flaw in elbow to pipe weld RC-0289
01582517, RB liner visual exam conditions
01582628, NDE work package drawings
01577436, 1R20 HSD Checks Deficiencies Identified, (A D-ring & Rx Head)

Miscellaneous
32-9075183, TMI NEI 97-06 Degraded Tube Analysis, Rev. 2
50-9185429, TMI Cold Leg Letdown Nozzle Weld Overlay Traveler, Rev. 0
50-9190205, Pressurizer Heater Bundle Installation Traveler, Rev. 0
BOP-PT-2013-030, Liquid Penetrant Examination Data Sheet for Prefreeze Surge Line Excavation Areas
BOP-PT-2013-031, Liquid Penetrant Examination Data Sheet for Prefreeze Surge Line
Event Notification 49512
TMI Unit 1 Outage T1R19 Steam Generator Condition Monitoring and Operational Assessment, Rev. 0
TMI Unit 1 Outage T1R20 Steam Generator Degradation Assessment, Rev. 0
UT-ISI-2013-006, UT Calibration/Examination Data Sheet for RC-0174
UT-ISI-2013-019, UT Calibration/Examination Data Sheet for RC-0206
VT-ISI-2013-065, Visual Examination of IWE Surfaces Data Sheet for Internal Moisture Barrier
VT-ISI-2013-090, Visual Examination of IWE Surfaces Data Sheet for Containment Liner Plate, Elev. 281'-305'

Work Orders
C2028856 C2029218 C2029290 C2029299 C2029535 C2029536 C2030238

Section 1R11: Licensed Operator Requalification Program

Procedures
Operations and Training Department just-in-time evolutions for plant shutdown and startup.

Miscellaneous
IR 1580109, T1R20 Lesson–Learned Just-In-Time Training for Plant Shutdown.

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-310, Implementation of the Maintenance Rule, Rev. 8
ER-AA-310-1005, Maintenance Rule Dispositioning Between A(1) and A(2), Rev. 6
OP-TM-122-301, Flow Test of FP-P-1/3 and FP-P-2A/B, Rev. 1
OP-TM-642-231
VM-TM-1120, Hydraulic Cleaner Unit, Rev. 0

Miscellaneous
(a)(1) Action Plan, September 12, 2013
IRs 1581323 1534082 1556826 1600658 1260236 1271951

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
1082.1, TMI Risk Management Program, Rev. 8
WC-AA-101, On-Line Work Control Process, Rev. 18

Drawings
302-711, Core Flooding Flow Diagram, Rev. 28
SS-209-024, Electrical Elementary Diagram, Rev. 4A

Miscellaneous
Protected Equipment Logs, October 16, 2013
WO R2224183
IR 1592429

Section 1R15: Operability Evaluations

Procedures
OP-AA-108-115, Operability Determinations, Rev. 10
OP-AA-108-115-1002, Supplemental Consideration for On-Shift Immediate Operability Determinations, Rev. 2
1301-10.1, Reactor Vessel Internal Vent Valve Inspection and Exercise, Rev. 20
1303-11.11, Station Battery Load Test, Rev. 36A

Miscellaneous
TS 4.16, Reactor Internals Vent Valves Surveillance
WO R2191244 R2153538
IR 1579892 1583961 1285955
VM-TM-0062, Technical Manual, Reactor 14" Internal Vent Valve, Rev. 32 dated 09/21/92

Section 1R18: Plant Modifications

CC-AA-102, Design Input and Configuration Change Impact Screening, Rev. 20
CC-AA-103, Configuration Change Control, Rev. 21

Section 1R19: Post-Maintenance Testing

Procedures
OP-TM-220-206, Pressurizer Heater Emergency Power Functional Test, Rev. 3
OP-TM-533-201, IST of DR-P-1A and Valves, Rev. 15

Drawings
SK-CBS-1, Support Frames for Pressurizer Heater Cable Bundles, Rev. 0

Miscellaneous
AREVA CR 2013-8572
ECR 12-00278, Replace Middle and Lower Pressurizer Heaters – CMT 611754, Rev. 0
ECR 12-00441, Replace Middle and Lower Pressurizer Heater Bundle, Rev 2
ECR 13-00035, Decay River Leak Repair, Rev. 0
ECR 13-00040, ESAS Actuation Cabinet 4A Relay Replacements, Rev. 0
ECR 13-00396, Pressurizer Surge Line Freeze Seal, Rev. 0
ECR 13-00458, MSSV Heated Post Shim Modification, Rev. 0

WOs	R2191962	R2195579	C2030471	C2027641	C2026928	
ARs	A2268202	A2294824				
IRs	1583047	1583863	1583866	1512606	1348188	1407500
	1407607	1408202	1408023	1407931	1581155	1585384
	1370394					

Section 1R20: Refueling and Other Outage Activities

Procedures
1015, Equipment Storage Inside Class 1 Building—RB Sump Clogging Post-LOCA, Rev. 7
1101-3, Containment Integrity and Access Limits, Rev. 91
1102-2 Plant Startup, Rev. 152
1102-10, Plant Shutdown, Rev. 98
1102-11, Plant Cooldown, Rev. 142B
1103-8, Approach to Criticality, Rev. 53
1103-11, RCS Water Level Control, Rev. 69
1104-6, Spent Fuel Cooling System, Rev. 44
1104-15D, Fuel Handling ESF Ventilation System, Rev. 22
1505-1, Fuel and Control Component Shuffles, Rev. 55
1505-3, Fuel Handling Problems, Rev. 21
1507-1, Polar Crane Operations, Rev. 26
1507-1, Attachment 7.3, Catwalk/ Miscellaneous Loads Safe Load Path and Handling Restrictions, Rev. 26
1507-3, Main Fuel Handling Bridge Operating Instructions, Rev. 29
1507-5, Spent Fuel Handling Bridge Operating Instructions, Rev. 41
OP-TM-220-567, Drain Cold Leg(s) to RCBT via RC Drain Pump, Rev. 3
OP-TM-300-205, Shutdown Margin for Hot Shutdown Conditions, Rev. 2
OP-TM-300-206, Shutdown Margin for Low Temperature Conditions, Rev. 1
OP-TM-310-401, Controlling Procedure for Physics Testing, Rev. 2
MA-TM-134-903, Reactor Vessel Disassembly, Rev. 9A
MA-TM-460-001, Planned Containment Entry-TMI1, Rev. 2

MA-TM-460-001, Planned Entry Checklist, Rev. 3
MA-AA-716-008, FME Zone Tools, Parts, and Equipment Log, Rev. 7
OP-TM-220-261, Reactor Coolant System VT-2 Exam, Rev. 8
OP-TM-AOP-060, RCS Leakage While on Decay Heat Removal, Rev. 4

Drawings
IE-153-02-002, General Arrangement of the Reactor Building--Core Flood Tank, Rev. 6
1D-ISI-CF001, Core Flood System, Rev. 2
302-711, Core Flooding Flow Diagram, Rev. 28

Miscellaneous
Apparent Cause Evaluation 1584978, Multiple Electrical Discrepancies Found in the MSO and PPC Projects
De-scope (Outage) Evaluations for DH-V-4B, including IRs 1587813, 1586168, and1586046
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* IR written based on NRC observation

WO C2028413

Section 1R22: Surveillance Testing

Procedures
1303-11.3, Surveillance Test and Set Main Steam Safety Valves, Rev. 38
1302-5.31B, 4160V D and E Bus Loss of Voltage Relay System Calibration, Rev. 18
MA-TM-244-222, Penetration 421 and 422 LLRT of RB-V-2A and RB-V-7, Rev. 3
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MA-TM-244-225, Penetration 330 LLRT of WDG-V-3 and WDG-V-4, Rev. 2
MA-TM-244-226A, Penetration 331 LLRT of WDL-V-303, WDL-V-304, and WDL-V-727, Rev. 1
MA-TM-244-210A, Penetration 420S/1015 HM-V1A & 1B and HM-V-2A & 2B, Rev. 1A
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OP-TM-220-252, Primary to Secondary Leak Rate Determination, Rev. 9
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TMI Appendix J Notebook, December 17, 2013
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01575810	01583483	01598590

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AR
A2342164

Section 1EP6: Drill Evaluation

TMI Site Emergency Preparedness Drill Scenario Manual, December 10, 2013
IRs 1596181 1595335 1595363

Section 2RS01-2RS04 Radiation Protection Inspection

Procedures

RP-AA-203-1001, Revision 7	Personnel Exposure Investigations
RP-AA-210, Revision 22	Dosimetry Issue, Usage, and Control
RP-AA-220, Revision 9	Bioassay Program
RP-AA-301, Revision 6	Radiological Air Sampling
RP-AA-302, Revision 6	Determination of Alpha Levels and Monitoring
RP-AA-401, Revision 16	Operational ALARA Planning and Controls
RP-AA-401-1002, Revision 4	Radiological Risk Management
RP-AA-460, Revision 24	Controls for High and Locked High Radiation Areas
RP-AA-460-001, Revision 4	Controls for Very High Radiation Areas
RP-TM-500, Revision 1	Installation of Temporary Shielding
RP-TM-300-1008, Revision 3	Radiological Controls for Plant Evolutions/Refuel Outages at TMI1
RP-TM-870-1000, Revision 0	Operation and Filter Replacement of Portable Ventilation Systems
RP-AA-870-1001, Revision 3	Set-Up and Operation of Portable Air Filtration Equipment
RP-AA-870-1002, Revision 5	Use of Vacuum Cleaners in Radiologically Controlled Areas
RP-AA-870-1003, Revision 3	Testing Portable HEPA Filter Units
OP 1101-3, Revision 92	Containment Integrity and Access Limits

1401-4.4C, Revision 6	Remove-Install EOTSG Upper Head Inspection Port Cover
TM-1-13-505/511	Scaffold Construction in Reactor Building/AP-020
TM-1-13-517	Reactor Disassembly & Refueling Support/AP13-007
TM-1-13-529	Under Vessel Inspection/AP13-019
TM-1-13-531	Alloy 600 Letdown Weld Overlay/AP13-022
TM-1-13-533	Control Rod Drive Replacement/AP-13-016
TM-1-13-534	In-core Detector Replacement/ AP 13-015
TM-1-13-536	Reactor Vessel Head Inspection/AP 13-013
TM-1-13-537	Pressurizer Heater Replacement/AP-021
TM-1-13-602	EOTSG Full Entries Including Nozzle Dam Installation/AP13-034

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Dose and Dose Rate Alarm Report for period 1/01/2013 through 11/07/2013
Personnel Exposure Investigation Reports
Personnel Contamination Event Reports
2013 Outage Dose Report by Department
TMI Dose Excellence Plan 2012-2016
1R20 Source Term Reduction Action Items
ALARA Waiver Forms
Planned Dose Rate Alarm Form
Station ALARA Committee Meeting Minutes held July 2013 through October 2013
Root Cause Investigation Report: Crud in Steam Generator Tubes After Plant Shutdown
Performance Improvement Plan - Benchmarking Report to Identify Industry Best Practices for Dose Reduction for:

- Reactor Disassembly/Re-assembly
- Fuel Movement & Inspections
- Once Through Steam Generator Maintenance & Inspections
- Control Rod Drive Mechanism Replacement
- Outage Installation & Removal

TMI Unit 1 Spent Fuel Pool Material Log

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Procedures
TQ-AA-166, Rev 1, Radioactive Material Shipping Training
RP-AA-605, Rev 5, 10CFR61 Program
RP-AA-100, Rev 8, Process Control Program for Radioactive Wastes
10CFR61 Waste Stream reports for: Powdex Resin; MWE Bottoms; DAW, CRDMs; CCB Filter
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Self-Assessments
AR01314769, Radwaste, December 2012
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HAZSEC, Rev 0, DOT Security Awareness and Transportation Security Plan
NRWSHP1000, Rev 3, DOT/79-19 Training for Support of Radioactive and Asbestos Shipments
Performance Training and Evaluation: Radioactive Material Shipment IAW IATA Rules
Performance Training and Evaluation: All Activities Associated with Shipping Radioactive Material/Waste Type B Shipments
Performance Training and Evaluation: All Activities Associated with Completion of Radioactive Material/Waste Type B Shipments
Task Certification Guide (TCG) for Classification Program Database Changes
TCG for All Activities Associated with Excepted Package Shipments
TCG for General Bill of Lading
TCG for All Activities Associated with Vehicle and Package Inspections for Radioactive Material Shipments
TCG for Al Activities Associated with Shipping Waste Shipments
Radioactive Material Shipments Records: RS-12-013-1; RS-12-089-1; RS-13-005-1; RS-13-006-1; RS-13-056-1

Section 4OA2: Problem Identification and Resolution

Procedures
AD-AA-101, Processing of Procedures and T&RMs, Rev. 6
AD-AA-101-F-01, Document Site Approval Form, OP-AA-201-01, Control of Transient Combustible Material (Revision), Rev. 5
AP 1038, Administrative Controls – Fire Protection Program, Rev. 80
ES-024T, Overload Heater Selection for Electrical Motors, 7/19/2012
HU-AA-1211-F-01, Pre-Job Brief Checklist, Rev. 1
LS-AA-125, Corrective Action Program (CAP) Procedure, Rev. 17
LS-AA-125-1001, Root Cause Analysis Manual, Rev. 10
LS-AA-128, Fire Protection Change Regulatory Review (OP-AA-201-009, Rev. 12), Rev. 1
MA-AA-716-026, Station Housekeeping/Material Condition Program, Rev. 10
OP-AA-102-105-1001, Exelon Nuclear Plan of the Day, Rev. 15
OP-AA-103-105, Test Plan for Westinghouse Thermal Overload Relays, Rev. 3
OP-AA-103-105, Limitorque Motor-Operated / Chainwheel Operated Valve Operations, Rev. 4
OP-AA-201-009, Control of Transient Combustible Material, Rev. 6
OP-AA-201-009, Control of Transient Combustible Material, Rev. 12
OP-TM-AOP-0011, Attachment 42: FA-Y-1, Yard, Rev. 8
OP-TM-EOP-010, Emergency Procedures Rules, Guides and Graphs, Rev. 16
OP-TM-424-902, EFW Alternate Inventory, Rev. 6
OP-TM-541-432, Backwashing NS-C-1A, Rev. 5
OP-AA-102-103-1001, Operator Burden and Plant Significant Decisions Impact Assessment Program, Rev. 4

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Take 10 for TMI, for Week of 1/14/13
Take 10 for TMI, for Week of 10/21/13

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Degraded Equipment Log, December 13, 2013
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Instructions for Type A Thermal Overload Relays Size 0, 1, and 2, Single Pole Non-Compensated or Ambient Compensated, February 1966
Protecting Motors Against Overload Conditions Using "I Squared T" Methods, February 1966
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Special Testing of Overload Relays, 10/25/2013

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TMI Nuclear Station, Fire Hazards Analysis Report (FHAR), 5/15/77
TMI Nuclear Station, Fire Hazards Analysis Report, Rev. 25
TMI Nuclear Station, Safety Evaluation Report (SER), 9/19/78

System Health Reports
TMI Fire Protection Program Health Report, 2nd Quarter 2013
TMI Fire Protection Program Health Report, 3rd Quarter 2013

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N-TM-TCCONTDBIG, OP-AA-201-009, Control of Transient Combustible Material (Power Point Presentation), Rev. 0
TQ-AA-223-F070, Doc. Based Instruction Guide, Control of Transient Combustibles, 4/1/13

Transient Combustible Permits
2013-031, Aux. Building Shield Area, 2/27/13
2013-071, "B" Fan Room, 5/22/13
2013-134, 322' Patio, 10/14/13
2013-142, Relay Room, 10/21/13

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	01493776	01506117	01504246	01511789	01515102	01520833
	01541149	01541544	01541554	01602025	01347306	01347306

Section 4OA3: Followup of Events and Notices of Enforcement Discretion

Procedures
OP-AA-101-113-1004, Event / Issue Report
OP-AA-106-101-1006, Issue Resolution Documentation
OP-TM-226-000, Reactor Coolant Pumps
OP-TM-226-102, Start RC-P-1B
OP-TM-301-471, Manual Control of Main Turbine

OP-TM-621-471, Manual Control of ICS Modules

Drawing
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Plant Computer plots during RC-P-1B restoration to 27% power, date December 6, 2013

Issue Reports
IR 1575608, TG-CV-2 Closure at 100% Power
IR 1593058, RC-P-1B Upper Bearing Lube Oil Level Lowering
IR 1596096, RC-P-1B Motor Refurb OEM CRS Without Corresponding IRs

Section 4OA7: Licensee-Identified Violations

Procedures
AP-1038, Fire Protection Program
OP-TM-211-000, Makeup System Operability Guidelines
OP-TM-211-281, Makeup System Lineup Verification
TMI Fire Hazards Analysis

Miscellaneous
Clearance: 13500511
IRs 1591314, 1606223, 1606284
Quick Human Performance Investigation for IR 1591314, presented January 9, 2014
WO C2029705

LIST OF ACRONYMS

1R20	Unit 1 20th Refueling Outage
AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
AP	ALARA Plan
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
CAP	Corrective Action Program
CCA	Common Cause Analysis
CCB	Chemical Cleaning Building
CEDE	Committed Effective Dose Equivalent
CFR	Code of Federal Regulations
CRDM	Control Rod Drive Mechanism
CWST	Concentrated Waste Storage Tank
DAW	Dry Active Waste
DB	Design Basis
DM	Dissimilar Metal
DRP	Division of Reactor Projects
ECT	Eddy Current Testing
ED	Electronic Dosimeter
EDEX	Effective Dose Equivalent External
EDG	Emergency Diesel Generator
FHAR	Fire Hazards Analysis Report
HEPA	High Efficiency Particulate Air
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IR	Issue Report
ISI	In-service Inspection
KV	Kilovolt
LER	Licensee Event Report
LHRA	Locked High Radiation Area
LOCA	Loss of Coolant Accident
MWE	Miscellaneous Waste Evaporator
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OTSG	Once-Through Steam Generator
pCi/g	Picocuries per Gram
PARS	Publicly Available Records
PCP	Process Control Program
PT	Liquid Penetrant Testing
QA	Quality Assurance
RB	Reactor Building
RCA	Radiological Controlled Area
RCE	Root Cause Evaluation

RCS	Reactor Coolant System
RG	Regulatory Guide
RWP	Radiation Work Permit
SER	Safety Evaluation Report
SDP	Significance Determination Process
SSC	Structure, System, or Component
TCFZ	Transient Combustible Free Zone
TCG	Task Certification Guide
TEDE	Total Effective Dose Equivalent
TMI	Three Mile Island Unit 1
TS	Technical Specifications
TTS	Tube-to-Tube Support Sheet
TTW	Tube-to-Tube Wear
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic Testing
VHRA	Very High Radiation Area
VT	Visual Testing