U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	05000320/2011008
Docket No.	05000320
License No.	DPR-73
Licensee:	GPU Nuclear, Inc.
Address:	341 White Pond Drive Akron, OH 44320
Locations Inspected:	Three Mile Island Station, Unit 2 Middletown, PA 17057-0791
Inspection Dates:	July 25-28, 2011
Inspectors:	Laurie A. Kauffman Health Physicist Decommissioning Branch Division of Nuclear Materials Safety Kathy Modes Senior Health Physicist Decommissioning Branch Division of Nuclear Materials Safety
Approved By:	Judith A. Joustra, Chief Decommissioning Branch Division of Nuclear Materials Safety

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EXECUTIVE SUMMARY

GPU Nuclear, Inc.
NRC Inspection Report No. 05000320/2011008

A routine announced safety inspection was conducted on July 25-28, 2011, at the Three Mile Island Station, Unit 2 (TMI-2) by two Region I inspectors. The NRC's program for overseeing the safe operation of a shut-down nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program." The inspection included a review of operations and management oversight, maintenance, corrective action program implementation, and plant support activities while in Post Defueling Monitored Storage (PDMS) status. Within the scope of this inspection, no safety concerns or violations were identified. The conclusions from each inspection area are presented below.

Organization, Management & Cost Control
The licensee has process controls, and an organization to effectively implement license requirements.

Safety Reviews, Design Changes, and Modifications
The licensee implemented a safety review program to maintain decommissioning safety and the facility configuration as described in their licensing basis.

Self-Assessment, Auditing, and Corrective Action Programs
The licensee's self-assessment, auditing, and corrective action programs were effective at identifying, resolving, and preventing problems. Action reports were properly prioritized and corrective actions were tracked in accordance with approved procedures.

Decommissioning Performance and Status Reviews at Permanently Shutdown Reactors (PSRs)
There has been no dismantlement or decommissioning activities performed since the previous inspection.

Maintenance and Surveillance
The licensee effectively implemented the preventive maintenance and surveillance program and associated procedures.

Occupational Radiation Exposure
The licensee effectively implemented the occupational exposure control program associated with the TMI-2 PDMS activities. The licensee maintained occupational radiation exposures as low as reasonably achievable (ALARA).

Effluent and Environmental Monitoring
The licensee effectively implemented and maintained the radioactive effluent controls program and the radiological environmental monitoring program.

REPORT DETAILS

1.0 Background Information

In December 1993, TMI-2 received a license from the NRC to enter Post Defueling Monitored Storage (PDMS). TMI-2 today is in long-term monitored storage. No further use of the nuclear part of the plant is anticipated. Ventilation and rainwater systems continue to be monitored. Equipment necessary to keep the plant in safe long-term storage continued to be maintained. The licensee plans to actively decommission TMI-2 in parallel with the decommissioning of the Three Mile Island, Unit 1 (TMI-1) after unit has been permanently shutdown.

2.0 Organization, Management & Cost Controls

a. Inspection Scope (Inspection Procedures (IP) 36801)

The inspectors evaluated any recent organization, management and staffing changes with respect to the PDMS Quality Assurance (QA) program outlined in the PDMS QA Plan. The inspectors reviewed Action Reports, interviewed Employee Concerns Program personnel, and reviewed Company Nuclear Review Board meeting minutes.

b. Observations and Findings

In early 2010, Exelon appointed a new PDMS Manager and PDMS Senior Specialist who have over 20 years of experience working at TMI. The inspectors determined that these individuals were cognizant of the TMI-2 process controls and license requirements. With a change in personnel, the licensee continued to maintain important records and history of the plant needed to support future decommissioning of TMI-2.

Action Report No. 01100971, "TMI-2 FENOC and EXELON Employee Concerns Program (ECP) Enhancements" describes the licensee's continued commitment to safety culture. ECP personnel provided details about the licensee commitment to maintain a high level of awareness to safety. The Company Nuclear Review Board (CNRB) meeting minutes demonstrated that the CNRB was attentive to the ECP.

Personnel from electrical, radiation protection, operations, radioactive waste, chemistry, security, maintenance, housekeeping, and quality assurance enter TMI-2 through the course of their normal work duties. Even though the facility is in a PDMS status, there are adequate resources available to ensure the licensee is meeting their licensing basis.

c. Conclusions

The licensee has process controls, and an organization to effectively implement license requirements. No findings of safety significance were identified.

3.0 Safety Reviews, Design Changes, and Modifications

a. Inspection Scope (IP 37801)

The inspectors reviewed a random sample of PDMS procedures to verify the licensee implements a safety review program that effectively maintains decommissioning safety and the facility configuration as described in their licensing basis.

b. Observations and Findings

The licensee updated their PDMS procedures to reflect current plant configuration and administrative processes, and to make some editorial changes. The typical categories of procedures that were changed were administrative, ventilation, electrical distribution, radioactive waste processing, fire protection, compressed air, and Technical Specification surveillance. Due to the non-operating and defueled status of TMI-2 during PDMS, there are no structures, systems, or components (SSC) that are required to meet the safety-related criteria. Therefore, there are no SSC classified as safety-related at TMI-2. All procedure changes and facility modifications at TMI-2 are made using the Exelon 10 CFR 50.59 Review Process, which provides a screening process to determine if the change requires a written evaluation.

c. Conclusions

The licensee implemented a safety review program to maintain decommissioning safety and the facility configuration as described in their licensing basis. No findings of safety significance were identified.

4.0 Self-Assessment, Auditing, and Corrective Action

a. Inspection Scope (IP 40801)

The inspectors reviewed the licensee's program for identifying, resolving, and preventing issues that could impact safety or the quality of future decommissioning activities. The inspectors reviewed the procedures describing the corrective action program and reviewed several issue reports (IRs), action reports (ARs), and the associated corrective actions. The inspectors discussed with cognizant personnel the tracking, current status, and closure of the selected IRs and ARs. The inspectors reviewed the August 2010 Nuclear Oversight (NOS) audit report and the April 2011 Fleet Oversight Audit Report (TMI-C-11-04-28).

b. Observations and Findings

The inspectors noted that there were approximately 178 ARs generated for TMI-2 and only 26 remained open at the time of the inspection. There were 61 ARs dealing with administrative issues, 17 that needed procedure changes, and 100 work orders generated. ARs were generated to address revision of plant procedures, effectiveness of fire brigades, lack of sample flow for the weekly tritium check, roof leaks, a radiation monitor out-of-service, and cork seam pump problems. The inspectors noted that there

has been a good questioning attitude among licensee staff and a desire for continuous improvement.

The Nuclear Oversight audit conducted last year (July 26 - August 13, 2010) was very detailed and comprehensive. The licensee also conducted a review of all of their internal procedures associated with TMI-2. The licensee reviewed procedures for radiation protection, emergency preparedness, security, maintenance, environmental, chemistry, and operations. Procedures were up-to-date and adequate for PDMS.

Another ongoing effort is an initiative by Emergency Preparedness to ensure that personnel working in TMI-2 will be able to hear personnel announcements in the event of an emergency.

c. Conclusions

The licensee's self-assessment, auditing, and corrective action programs were effective at identifying, resolving, and preventing problems. ARs were properly prioritized and corrective actions were tracked in accordance with approved procedures. No findings of safety significance were identified.

5.0 Decommissioning Performance and Status Review

a. Inspection Scope (IP 71801)

The inspectors reviewed the licensee's current decommissioning status with respect to the TMI-2 PDMS QA Plan.

b. Observations and Findings

The total special nuclear material inventory is less than 1,086 kilograms. The three locations with the highest activities are: the reactor vessel with approximately 925 kilograms, the reactor coolant bleed tank room with 3.5 kilograms, and the "A" spent fuel pool with 3.8 kilograms of special nuclear material.

The licensee plans to actively decommission TMI-2 in parallel with the decommissioning of TMI-1 after that unit has been permanently shutdown. Since TMI-1's license was recently renewed for an additional 20 years of operation, the licensee is in discussions with the NRC staff to extend the expiration date of the TMI-2 NRC license. The TMI-2 license currently expires in 2014.

c. Conclusions

There has been no dismantlement or decommissioning activities performed since the previous inspection. No findings of safety significance were identified.

6.0 Maintenance and Surveillance at PSRs

a. Inspection Scope (IP 62801)

The inspectors reviewed the licensee's preventive maintenance (PM) and surveillance test (ST) program for structures, systems, and components important for maintaining the safe storage of radioactive material and the implementation of primary containment isolation requirements, TS 3/4.1, *Containment Systems*. Specifically, the inspectors evaluated the licensee's implementation of the maintenance program associated with the containment isolation. The inspectors toured the containment isolation system and the reactor building atmospheric breather system. The inspectors observed the licensee perform select STs associated with the cork seam and ventilation system. The inspectors reviewed selected STs, toured plant areas, and discussed aspects of the STs with individuals cognizant of the performance of the above systems and components.

b. Observations and Findings

The inspectors determined that the licensee increased their attention to fire protection. During a tour of TMI-2, the inspectors observed new fire protection equipment (including acquisition of fire extinguishers and the installation of a fire resistance wire known as Protectowire thermal detection systems) throughout the plant and noted that housekeeping has eliminated combustibles.

Operations personnel demonstrated how they conduct their containment isolation surveillance. The inspectors verified the containment isolation valves were properly tagged and locked. There are approximately 200 containment isolation valves, 15 containment isolation flanges, three pipe caps, and two personnel hatches that make up the containment isolation system. Every five years on an annual staggered test basis, the licensee visually inspected the bolted or welded blind flanges which form a containment isolation boundary and the equipment hatch for signs of degradation and/or leakage. The licensee monitored the four open Reactor Breather isolation valves for releases.

On two separate occasions during the inspection, Operations personnel demonstrated how they remove water from a cork seam and how they record the pressure difference for the filters associated with the Auxiliary and Fuel Handling buildings exhaust heating and ventilation system. In each case, licensee personnel used the correct procedure, followed the procedure, documented their measurements, and successfully demonstrated their ability to perform the task correctly.

c. Conclusions

The licensee effectively implemented the preventive maintenance and surveillance program and associated procedures. No findings of safety significance were identified.

7.0 Occupational Radiation Exposure

a. Inspection Scope (IP 83750)

The inspectors evaluated the implementation of the occupational exposure control program associated with the TMI-2 PDMS activities. The inspectors reviewed occupational exposure reports for calendar year 2010 and the most current data for 2011. The inspectors reviewed the key control process for locked high and very high radiation areas with Radiation Protection personnel. The inspection consisted of interviews with responsible individuals and observations of radiological postings and signs in radiologically controlled areas.

b. Observations and Findings

In calendar year 2010, the collective exposure was 364 mrem. As of June 30, 2011, the collective exposure was 267 mrem. The largest contribution was obtained in April, during the annual reactor building containment entry. In 2010, this entry accounted for 266 of the 364 mrem exposure. In 2011, the collective exposure for this entry was 181 mrem. The licensee informed the inspectors that they are reconsidering an annual entry based on ALARA and that the data obtained from the previous entries has shown little change or degradation of the integrity of the reactor building.

On April 20, 2011, 15 individuals entered the reactor building containment, which is posted as Grave Danger Very High Radiation Area. The ALARA post-job review noted that they received 0.171 person-rem. This was slightly more than the 0.149 person-rem estimated, but within the regulatory dose limits. The licensee showed the inspectors the photographs that were taken during the last reactor containment entry in April 2011, which clearly demonstrated the continued use of shielding and appropriate labeling of radiological control areas.

The licensee used a check form to verify that all locked high and very high radiation areas keys were maintained and secured. The licensee maintained strict control of the Very High Radiation Area keys and the Locked High Radiation Area keys. Radiation Protection personnel informed the inspectors that they vigorously challenge the latching mechanism in order to ensure that the actual locked conditions exist. Radiation Protection personnel also verified that there were effective barriers in place to prevent unauthorized entry into these areas as well as proper postings. The licensee is currently replacing their caution radiation postings with newly acquired postings. This will be accomplished by September 2011.

c. Conclusions

The licensee effectively implemented the occupational exposure control program associated with the TMI-2 PDMS activities. The licensee maintained occupational radiation exposures ALARA. No findings of safety significance were identified.

8.0 Effluent and Environmental Monitoring

a. Inspection Scope (IP 84750)

The inspectors reviewed the radioactive effluent control program and the site radiological environmental monitoring program. The evaluation included a review of the annual radioactive effluent release report for 2010, the annual radiological environmental operating report for 2010, and the associated analytical results for each.

b. Observations and Findings

The licensee analyzed liquid and gaseous effluent releases, as well as fish, sediment, and cow milk samples to compile their radiological environmental monitoring and operating reports. The Off-Site Dose Calculation Manual used to arrive at their conclusion was revised on December 14, 2010 as part of the licensee's initiative to maintain up-to-date procedures using the latest guidance available. The licensee's annual effluent and environmental monitoring reports demonstrated that all calculated doses were well below regulatory dose criteria of 10 CFR 50, Appendix I.

c. Conclusions

The licensee effectively implemented and maintained the radioactive effluent controls program and the radiological environmental monitoring program. No findings of safety significance were identified.

Exit Meeting Summary

On July 28, 2011, the inspectors presented the inspection results to Mr. Michael Casey, Responsible Engineer, FirstEnergy/GPU Nuclear and other members of your organization, and members of the Exelon management and staff. The inspectors confirmed that proprietary information was not removed from the site.

PARTIAL LIST OF PERSONS CONTACTED

LICENSEE

R. Libra	Plant Manager
M. Ford	PDMS Manager
J. Francis Boyd	PDMS Sr. Specialist
M. Casey	FENOC engineer/Senior Consultant
B. Carn	Radiation Protection
J. Flora	Radiation Protection
D. Knaby	Radiation Protection
R. Freeman	Chemistry
L. Weber	Environmental chemist
D. Neff	Emergency Preparedness
K. Oster	Operations
D. Windle	Operations
T. Haaf	Operations
J. Grove	Regulatory Assurance
M. Fitzwater	Regulatory Assurance
E. Schmeichel	NOS Lead /Acting Manager
T. Van Wynn	Training
T. Geyer	Employee Concerns Program Site Representative
K. Pedersen	Employee Concerns Investigator with Exelon Corporate

STATE

D. Dykman	Commonwealth of Pennsylvania

NRC

D. Werkheiser	Senior Resident Inspector
J. Buckley	NRC HQ, Project Manager for TMI-2

SUPPLEMENTAL INFORMATION

None.

INSPECTION PROCEDURES USED

36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors
37801 Safety Reviews, Design Changes, and Modifications at PSRs
40801 Self Assessment and Corrective Action at PSRs
62801 Maintenance and Surveillance at PSRs
71801 Decommissioning Performance and Status Reviews at PSRs
83750 Occupational Radiation Exposure
84750 Radioactive Waste Treatment and Effluent and Environmental Monitoring

ITEMS OPEN, CLOSED, AND DISCUSSED

Opened, Closed and Discussed – None.

LIST OF DOCUMENTS REVIEWED

Electric Insurance Limited Property Loss Control Comprehensive Evaluation Report April 2011

TMI Unit 2 collective exposure for 2010 and 2011

ALARA Post-Job Review for Unit -2 Reactor Bldg Annual PDMS Survey and Unit-2 Management Inspection dated April 26, 2011

Biennial 10 CFR 50.59 and PDMS SAR Report dated February 15, 2010

Technical Specifications for PDMS – Amendment 63 for License 50-320 issued May 1, 2009

Locked High Radiation Area Control Check Form dated December 19, 2009

Fleet Oversight Audit Report: TMI-C-11-04-28 dated April 2011

Releasing Radioactive Gaseous Effluents – TMI-2 Reactor Building – Radiological Controls Procedure 6610-ADM-4250.14 Revision 5 effective dated April 14, 2010

Combined 2010 Annual Radioactive Effluent Release Report dated April 27, 2010

Various surveillance tests from April 22, 2010 – July 27, 2011 such as:

RMS Calibrations – Surveillance Test Procedure No. 2303-4.15E dated: 7/23/10, 8/3/10, 9/2/10, 1/15/11, 3/10/11, 5/11/11, and 6/4/11

Actual surveillance test conducted on 5/11/2011 for Flow Alarm Check of TMI-2 Atmospheric RMS monitors procedure 2303-4.15E revision 5, dated 11/11/10

Actual surveillance test conducted on 6/4/11 for PDMS RMS (Victoreen) Functional test procedure no. 2303-4.15A Revision 12, dated 10/05/10

Actual surveillance test conducted on 3/10/11 for Flow and Vacuum Calibrations for TMI Atmospheric Effluent Radiation Monitors Procedure No. 1302-3.4D, Revision 4

Actual surveillance test conducted on 7/23/10, 8/3/10, 9/2/10 and 1/15/11 for Calibration of TMI-2 RMS Particulate Channels Procedure No. MA-2TM-2662-201 Revision 0

Actual surveillance test conducted on 6/2/10 for Reactor Building Purge Exhaust Filter Inspect/DOP test; Surveillance test procedure No. 2303-11.14 Revision 5, dated 11/01/02

Test conducted on 5/18/2010 and 4/18/11 for Reactor Building Breather Filter Analysis

Surveillance test Procedure No. 2301-4.7D, Revision 8, dated 3/27/09

Test conducted on 4/20/11 for Reactor Building Survey Surveillance test procedure No. 2301-4.3 Revision 5

Test conducted on 4/19/11 for reactor Building Purge Exhaust Filter Operations Check procedure no. 2303-5.10 Revision 6, dated 9/24/02

Tests conducted 6/7/10, 12/6/10, and 6/13/11 for Aux bldg Ventilation Air Cleanup Operational Check procedure no. OP-2TM-2829-201 Revision 0

Test conducted 6/13/11 for Fuel Handling Bldg Air Cleanup Operational Check procedure no. 2303-5.9 Revision 10

Test conducted on 4/30/11 for Operability Check of the TMI-2 Equipment Hatch Personnel Airlock Doors, procedure No. 2303-11.20A Revision 5 dated 10/13/08

Test conducted on 4/30/11 for Operability Check of the TMI-2 Ante Room Personnel Airlock Doors, procedure No. 2303-11.20B Revision 5 dated 10/13/08

Test conducted on 7/10/10 for Ventilation Filter DOP & Halide Testing, Procedure No. U-36 Revision 14A

Test conducted on 7/10/10 for TMI-2 Soiled Exhaust Filter Train Efficiency Test, procedure No. 2303-11.57, Revision 0 dated 9/19/02

Tests conducted on 6/14/10 and 6/13/11 for TMI-2 Soiled Exhaust Filter Train Operational Check, procedure No. 2303-5.11, Revision 0 dated 9/12/02

Test conducted on 1/18/11 for TMI-2 Auxiliary and Fuel Handling Building PDMS Radiological Surveys, procedure No. 2301-4.2, Revision 8, dated 5/12/04

Test conducted on 7/21/10 for PDMS – Remote Area Inspection Procedure No. 2OPS-S020, Revision 2, dated 7/27/04

PDMS TMI-2 Daily Checks Procedure No. 2301-1 Revision 21 dated 1/15/11, 2/14/11, 3/15/11, 4/15/11, 6/15/11, and 7/13/11

TMI-2 vent sampling weekly and monthly composite reports dated 12/31/10, 2/12/11, 5/14/11, and 7/9/11 TMI-2 Vent Sampling Procedure No. 2301-4.7 Revision 18, dated 10/11/06

Tests conducted on 7/21/10, 10/13/10, 1/19/11, and 4/20/11 for Verification of TMI-2 Containment Isolation, procedure No. OP-2TM-2244-201, Revision 0

Issue Report Nos. 01088266 and 01088266

Action Reports Nos.

AR 01062052	AR 01100971	AR 01101009	AR 01101015
AR 01121145	AR 01101025	AR 01080691	AR 01092576
AR 01111195	AR 01177620	AR 01210935	AR 01244013

LIST OF ACRONYMS USED

ALARA	as low as reasonably achievable
AR	action report
CNRB	Company Nuclear Review Board
DOP	dioctyl phthalate
ECP	employee concerns program
FENOC	FirstEnergy Nuclear Operating Company
GPUN	GPU Nuclear, Inc.
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	issue report
NOS	Nuclear Oversight
NRC	Nuclear Regulatory Commission
NRC HQ	Nuclear Regulatory Commission headquarters
PDMS	Post-Defueling Monitored Storage
PDMS Plan	PDMS Quality Assurance (QA) Plan
PM	preventive maintenance
PSR	Permanently Shutdown Reactor
QA	quality assurance
RMS	radiation monitoring system
SAR	Safety Analysis Report
SSC	structures, systems, or components
ST	surveillance test
TMI	Three Mile Island Station
TMI-1	Three Mile Island Station, Unit 1
TMI-2	Three Mile Island Station, Unit 2
TS	technical specification