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

August 28, 2024

Jeff Richardson
President
TMI-2 Solutions, LLC and Energy Solutions, LLC
121 West Trade Street
Charlotte, NC 28202

SUBJECT: TMI-2 SOLUTIONS, LLC, THREE MILE ISLAND NUCLEAR STATION, UNIT 2 - NRC INSPECTION REPORT NOS. 05000320/2024001 and 05000320/2024002

Dear Jeff Richardson:

On June 30, 2024, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection under Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program," at the permanently shutdown Three Mile Island Nuclear Station, Unit 2 (TMI-2). The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of observations by the inspectors, interviews with site personnel, a review of procedures and records, and plant walk-downs. The results of the inspection were discussed with David Delvechio, Project Director, and other members of your staff on July 18, 2024, and are described in the enclosed report.

Based on the results of this inspection, one violation of NRC requirements with no or relatively inappreciable (very low) safety consequence (Severity Level IV) is documented in this report. Because of its very low safety significance and because the issue was entered into your corrective action program, the NRC is treating the violation as a Non-Cited Violation (NCV) , consistent with Section 2.3.2.a of the Enforcement Policy. If you contest the subject or severity of this NCV, you should provide a response within 30 days of the date of this letter, 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; and the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-001.

In accordance with Title 10 of the *Code of Federal Regulations* (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 made available electronically for public inspection in the NRC Public Document Room or from the NRC document system (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response, if any, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Radioactive Waste**; **Decommissioning of Nuclear Facilities**; then **Regulations, Guidance and Communications**. The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC, Organizations & Functions**; **Office of Enforcement; Enforcement documents;** then **Enforcement Policy** (Under 'Related Information'). You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

No reply to this letter is required. Please contact Harry Anagnostopoulos of my staff at 610-337-5322, if you have any questions regarding this matter.

Sincerely,

ELISE EVE Digitally signed by ELISE EVE
Date: 2024.08.28 14:06:25 -04'00'

Elise Eve, Team Leader
Decommissioning Team
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Radiological Safety and Security

Docket No.: 05000320
License No.: DPR-73

Enclosure: Inspection Report Nos. 05000320/2024001 and 05000320/2024002

cc w/ encl: Distribution via ListServ

SUBJECT: TMI-2 SOLUTIONS, LLC, THREE MILE ISLAND NUCLEAR STATION, UNIT 2 - NRC INSPECTION REPORT NOS. 05000320/2024001 and 05000320/2024002 DATED AUGUST 28, 2024

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U.S. NUCLEAR REGULATORY COMMISSION
REGION 1

INSPECTION REPORT

Docket No.:	05000320
License No.:	DPR-73
Licensee:	TMI-2 Solutions, LLC (TMI-2S)
Facility:	Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Location:	Middletown, PA 17057
Inspection Dates:	January 1, 2024, to June 30, 2024
Inspectors:	K. Warner, CHP, Senior Health Physicist Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security H. Anagnostopoulos, CHP, Senior Health Physicist Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security S. Hammann, Senior Health Physicist Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security A. Taverna, Health Physicist Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security R. Turtil, Acting Branch Chief Financial Assessment Branch Division of Rulemaking, Environmental, and Financial Support Office of Nuclear Materials Safety and Safeguards J. Kulp, Senior Reactor Inspector Engineering Branch 1 Division of Operating Reactor Safety
Accompanied By:	G. Eklund, Health Physicist Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security
Approved By:	E. Eve, Team Leader Decommissioning Team Decommissioning, ISFSI, and Reactor Health Physics Branch Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

TMI-2 Solutions, LLC (TMI-2S)
Three Mile Island Unit 2 (TMI-2)
NRC Inspection Report Nos. 05000320/2024001 and 05000320/2024002

A routine announced decommissioning inspection was completed at the permanently shutdown TMI-2 on June 30, 2024. On-site inspection activities were performed January 23 – 25, March 5 – 6, April 30 – May 2, May 21, June 13, and June 24 – 25, 2024. The inspection included a review of design changes and modifications, problem identification and resolution, financial assurance, fire protection, occupational radiation exposure, radiation protection instrumentation, decommissioning performance and status, and solid radioactive waste management and transportation. The inspection consisted of observations by the inspectors, interviews with site personnel, a review of procedures and records, and plant walk-downs. The U.S. Nuclear Regulatory Commission's (NRC's) program for overseeing the safe operation of a shutdown nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program."

List of Violations

One Severity Level IV NCV (with two examples) of TMI-2 Technical Specifications (TS) Section 6.11 is documented for the licensee's failure to implement controls for Locked High Radiation Areas (LHRAs) as required by procedure TMI2-RP4-PR-002, "Controls for High Radiation Areas, Locked High Radiation Areas, Very High Radiation Areas, and Key Control." Specifically, on August 28, 2023, a worker entered the Containment Air Control Envelope (CACE) building using an incorrect Radiation Work Permit (RWP) and without receiving an LHRA radiological briefing, and on April 18, 2024, a worker entered the reactor building on an RWP task that did not allow access to an LHRA after several radiological protection barriers failed. TMI-2S entered the issues into the corrective action program as CR-2023-0261 and CR-2024-0325, respectively.

1.0 Background

In December 1993, TMI-2 received a possession-only license from the NRC to enter Post-Defueling Monitored Storage (PDMS). On December 18, 2020, the license for TMI-2 was transferred from GPU Nuclear, Inc. to TMI-2 Solutions (TMI-2S) (ADAMS No. ML20352A381). On March 31, 2023, an amended license was issued removing TMI-2 from PDMS and allowing them to begin decommissioning activities (ADAMS No. ML23051A042). TMI-2 was inspected under the "Actively Decommissioning (DECON), Fuel in the Spent Fuel Pool" Category as described in IMC 2561 during this inspection period.

2.0 Active Decommissioning Performance and Status Review

a. Inspection Scope [Inspection Procedures (IPs) 37801, 40801, 64704, 71801, 83750, and 86750]

The inspectors performed on-site decommissioning inspection activities on January 23 – 25, March 5 – 6, April 30 – May 2, May 21, and June 24 – 25, 2024, supplemented by in-office document reviews and periodic phone calls. The inspections consisted of observations by the inspectors, interviews with site personnel, a review of procedures and records, and plant walk-downs.

The inspectors conducted document reviews and interviews with plant personnel to determine if TMI-2 procedures and programs conformed to the requirements associated with 10 CFR 50.59. The inspectors also reviewed the TMI-2 process to determine if a 10 CFR 50.59 evaluation was required and reviewed a sampling of 10 CFR 50.59 screenings. The inspectors reviewed the TMI-2 training requirements for 10 CFR 50.59 screeners and evaluators and the qualifications for two of the individuals. Inspectors interviewed site personnel and reviewed the 50.59 screening, engineering evaluations and directions, and modification packages to restore the reactor building (RB) polar crane for use to a 300 Ton capacity and ensure key considerations were effectively evaluated to maintain plant safety.

The inspectors reviewed a representative selection of Corrective Action Program (CAP) documents and attended a management review committee meeting to determine if a sufficiently low threshold for problem identification existed, if follow-up evaluations were of sufficient quality, and if TMI-2 assigned timely and appropriate prioritization for issue resolution commensurate with the significance of the issue. The inspectors reviewed the implementation of the safety conscious work environment at the site.

The inspectors attended licensee meetings, including plan of the day meetings, safety meetings, and pre-job briefings, and reviewed the current status of the overall project to determine compliance with the license, Technical Specifications (TS), and Post-shutdown Decommissioning Activities Report. The inspectors performed a walk-down of the site and evaluated housekeeping and material condition of the site. The inspectors reviewed the 10 CFR 50.75(g) file to determine if spills were being submitted to the file and whether the TMI-2's procedure had adequate guidance to implement the requirement.

The inspectors reviewed documents and interviewed plant personnel to assess the effectiveness of TMI-2's decommissioning fire protection program and to determine if it was maintained and implemented to address the potential for fires that could result in the release or spread of radioactive materials. Documents reviewed included the fire protection plan, implementing procedures, routine surveillances, self-assessments, and corrective action documents. The inspectors conducted walkdowns of selected fire zones in the auxiliary building, fuel handling building, and RB to determine if the location of the fire extinguishers matched the fire plans and whether they were maintained appropriately and to assess the housekeeping in these areas. The inspectors observed hot work associated with the RB air cooler removal to determine if work was being done in accordance with the applicable fire protection program implementing procedures.

The inspectors reviewed the status of the decommissioning trust fund and met with TMI-2S staff to determine whether the funds were used as expected and if any changes had the potential to significantly impact the site's decommissioning financial assurance.

The inspectors performed tours of the Radiologically Controlled Area (RCA), including portions of the RB, auxiliary/fuel handling building, turbine building, and Containment Air Control Envelope (CACE) building to assess radiological postings, high radiation area, and locked high radiation area (LHRA) controls as applicable. The inspectors reviewed Radiation Work Permits (RWPs) and As Low As Reasonably Achievable (ALARA) work plans and performed observations of work in-progress which included the removal of core flood tank piping, decking removal in the reactor cavity, demolition of the fuel handling bridge on the 347-foot elevation of the fuel handling building, removal of water supply piping from the containment air coolers, and loading of RB waste into shipping containers in the CACE building. These reviews and observations were done to determine if TMI-2S was identifying the magnitude and extent of radiological hazards, was adequately assessing radiological hazards, was providing adequate worker radiation protection, and was implementing appropriate radiological controls.

The inspectors observed mock-up activities related to planned remote demolition of a cinder-block wall using a robotic system (Brokk machine and attachments) and interviewed the operators of the system regarding equipment effectiveness and plans for deployment.

The inspectors reviewed TMI-2's safe fuel mass limit calculation to develop an understanding of the assumptions in the calculation to use during review of future site activities involving fuel bearing material under the 10 CFR 50.59 process.

The inspectors evaluated the on-site storage of dosimeters before their issuance, during use, and before processing/reading, including storage in a low dose area alongside control dosimeters. The inspectors evaluated if correlations between electronic personnel dosimeters used at the station and the dosimeter of legal record were being performed and if substantial discrepancies were investigated.

The inspectors evaluated TMI-2's program for monitoring workers for unplanned intakes of radioactive material. The inspectors evaluated the adequacy of TMI-2's internal dose assessments for actual internal exposures, including; whether the affected personnel were properly monitored with calibrated equipment, if TMI-2 had appropriate in-vitro bioassay collection kits on-hand, and provided appropriate guidance for when and how to collect a sample. The focused evaluation included a personnel contamination and

unplanned minor intake of radioactive material for one radiation worker involved in removal of the manway for a Core Flood Tank.

The inspectors reviewed the results of radiation protection program audits related to internal and external dosimetry, and reviewed TMI-2's procedures that are associated with internal and external dosimetry operations. The inspectors reviewed the facility's prospective internal and external dosimetry evaluations, which determine when dosimetry monitoring is required. The inspectors assessed whether TMI-2S had adequately characterized the types and energies of radiation monitored, including the proper application of scaling factor techniques for hard-to-detect radionuclides, when evaluating radioactive source terms, and when performing internal dose assessments. The inspectors assessed the average beta energy for the radioactive contamination present in the RB and the auxiliary/fuel handling building and reviewed the radiological controls that are applied in elevated beta dose rate fields.

The inspectors selected a sample of portable radiation protection instruments which were in-use (or staged and ready for use) to assess the instrument's material condition and function. The inspectors witnessed TMI-2S staff performing routine response checks of the instruments. The inspectors reviewed the most recent record of calibration for these portable instruments, and evaluated the actions taken by TMI-2S for any instruments found to be out of calibration.

The inspectors evaluated the positioning of continuous air monitors in radiologically controlled areas and observed the routine response checking of one monitor. The inspectors met with radiation protection technical staff to discuss difficulties in employing the alpha contamination monitoring channel of the air monitors, the characterization of the Radon/Thoron environment at the site, and the interim actions to be taken in response to an air monitor alarm when the presence of Radon/Thoron is suspected.

The inspectors observed the routine response checks on a personnel contamination monitor and a portal monitor and reviewed the most recent record of calibration for those monitors. The inspectors evaluated the alarm set point values to determine if they were reasonable to ensure that licensed material is not released from the site.

The inspectors reviewed the detector characterization and calibration reports for two high-purity germanium (HPGe) detectors that are used by TMI-2S to identify and quantify gamma-emitting radionuclides. The inspectors examined the most recent annual energy calibration check for these detectors and reviewed the routine performance testing data (in the form of quality control charts).

The inspectors observed the routine calibration and performance checks of a liquid scintillation counter located at Unit-1. The effort included a review of sample preparation procedures, laboratory protocols, and a review of performance testing data (in the form of quality control charts). This instrument is used to analyze samples from the Unit-2 effluent gas streams for tritium.

The inspectors reviewed the most recent annual calibration report for the FASTSCAN whole body counting system.

The inspectors selected one of each type of gaseous effluent monitor instrument and reviewed the most recent calibration report and routine functional testing report for each.

The inspectors reviewed the Offsite Dose Calculation Manual to confirm that the effluent monitor instruments were calibrated, tested, and maintained at the required frequency. The inspectors observed the routine weekly filter change on the gaseous effluent monitors and discussed the conduct of weekly and monthly effluent monitor surveillances with an operator.

The inspectors observed activities, interviewed personnel, performed walkdowns and reviewed documentation to evaluate the effectiveness of the licensee's programs for handling, storage, and transportation of radioactive material. The inspectors performed a walk-down of several radioactive waste storage locations to determine if the licensee had properly classified and stored radioactive materials. Additionally, inspectors reviewed shipment manifests ensure compliance with the applicable NRC and Department of Transportation (DOT) regulations, and the training records to determine if radwaste personnel were qualified to appropriately implement the site solid radwaste program. The inspectors reviewed the most recent sealed source inventory and leak tests to determine compliance with NRC regulations. The inspectors reviewed the calibration documentation, associated procedures, and performed observations of the exit truck monitor during an instrument response and efficiency check.

The inspectors reviewed the materials security program to determine if they met the requirements in 10 CFR Part 37.

b. Observations and Findings

The inspectors determined that 10 CFR 50.59 screenings were adequately performed, and the site had trained and qualified individuals to perform the screenings and evaluations. The inspectors determined that no changes or modifications requiring prior NRC approval were made in the past year. The inspectors reviewed the first of several modification packages associated with the building and design of the decommissioning support building, a temporary structure to provide a multi-purpose facility for use during decommissioning and dismantlement of TMI-2. The RB polar crane was originally rated at 500 Ton on the main hook and 25 Ton on the auxiliary hook. Due to damage from the March 1979 accident, and a subsequent notification indicating a potentially severe safety issue on the main hoist the crane was taken out of service in the 1990's. TMI-2S has on-going work to refurbish the crane to a 300 Ton capacity for use in the decommissioning of the site. All TMI-2S work on the crane was conducted in accordance with site procedures and work plans. Further review of the work and load testing of the crane will be performed in future inspections.

The inspectors determined that issues had been identified and entered into the CAP in a timely manner and the issues were effectively screened, prioritized, and evaluated commensurate with their safety significance. The inspectors provided feedback that the written descriptions and evaluations of some CAP products did not provide sufficient information for the reader to understand the issue and actions taken necessitating in depth interviews to determine adequacy of corrective actions. The inspectors determined that the site had an appropriate focus on safety conscious work environment and that employees were free to raise concerns.

The inspectors noted management maintained a high level of engagement regarding all aspects of the project and worker safety was prioritized during meetings. The inspectors determined during the site walk-downs that housekeeping and plant material condition

standards were being maintained in the auxiliary building. The inspectors noted that work areas on the 347' of the fuel handling building and the 305' and 347' of the RB had excess material, including piled up bags of radwaste near (within 35') an area of intermittent hot work on the 305'. TMI-2S entered the concern into their CAP as CR-2024-0551. The inspectors noted that during this inspection period, TMI-2S began removal of the air coolers in the RB, began construction of the decommissioning support building, continued enlargement of the RB equipment hatch, and partially filled the reactor vessel with water.

The inspectors reviewed the 10 CFR 50.75(g) file and the Historical Site Assessment, dated February 15, 2001. While the inspectors did not immediately identify any specific spills or unusual occurrences that were not entered into the file, the inspectors noted that TMI2-RP4-PR-003, Revision 0 scope/applicability states "10 CFR 50.75(g) and 10 CFR 72.30(d) records are not applicable for radiologically posted areas on site." The equivalent Constellation procedure also includes the same wording and is utilized for any TMI-2 spills that occur outside of buildings onsite and was used prior to Energy Solutions Jingoli Decommissioning LLC (ESJI) acquiring TMI-2. The inspectors noted that 10 CFR 50.75(g)(1) requires that records be kept of "spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures where there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete." Radiologically posted areas on site are not called out as an exception to this regulation. The licensee entered this concern into their CAP as CR-2024-0615. The inspectors will continue review on this issue during a future inspection.

The inspectors noted that the NRC's review of TMI-2's safe fuel mass limit calculation can be found in section 3.2.5 of the NRC safety evaluation for amendment No. 67 to Possession-Only License No. DPR-73 (ML23051A044). The inspectors determined that TMI-2S developed procedure TMI2-DM-PR-007, Implementation of Defense in Depth Controls for Nuclear Criticality Safety, Revision 0, to establish requirements for defense in depth to further preclude any nuclear criticality safety events.

During the on-site June inspection, the inspectors identified a potential gap in the fire program basis as well as several potential non-compliances with the program, including two areas with equipment that lacked a transient combustible permit. TMI-2S entered these issues into their CAP as CR-2024-0550 and CR-2024-0551, respectively. An open item was initiated to track the NRC's continued review of TMI-2's fire protection program to determine if the program was adequately designed and implemented in accordance with NRC regulations and licensee commitments **(Open Item 05000320/2024002-01, Continued Review of TMI-2's Fire Protection Program).**

The inspectors determined that the funds in the decommissioning trust fund were used as expected. The inspectors noted that a March 14, 2024, letter from TMI-2S to the NRC included a notification of a schedule change in accordance with 10 CFR 50.82(a)(7). This schedule change was reflected in the March 28, 2024, submittal to the NRC with Revision 6 to the Post-Shutdown Decommissioning Activities Report (PSDAR).

The inspectors conducted an evaluation of the external and internal dosimetry programs. The inspectors confirmed that Energy Solutions processed, stored, and used external

dosimetry such that assigned occupational doses were representative of actual plant exposures. The inspectors established that site personnel dosimeters were processed by an accredited processor and that the approved radiation test categories for each type of personnel dosimeter were consistent with the types and energies of radiation present. The inspectors confirmed that TMI-2 has appropriate in-vitro bioassay collection kits on-hand and provided appropriate guidance for sample collection and processing.

The inspectors reviewed numerous technical basis documents associated with the occupational radiation exposure program. These documents are foundational to the radiation protection program, therefore the inspectors endeavored to focus on the adequacy of these documents early in the active decommissioning effort. The review effort began in January 2024 and included the following documents:

- TMI2-RP-RPT-2022-0004, “Site Specific Values for Air Sampling Calculations,” Rev. 1
- TMI2-RP-RPT-2023-0005, “Addendum to TMI-RP-RPT-2022-0003 TMI-2 Validation of Beta Correction Factor,” dated 4/6/2023.
- TMI2-RP-RPT-2023-0006, “Requirements for When to Use Specific Lens of the Eye Protection,” dated 4/13/2023.
- TMI2-RP-RPT-2023-0008, “Internal Dose Assessment Scaling Factors,” Revision 0
- TMI2-RP-RPT-2024-0001, “TMI-2 Residential / Home Study and Area TLD Study,” dated 1/15/2024.

The inspectors determined that, in some cases, the technical basis documents lacked adequate evidence, adequate data, or did not contain the technical rigor needed to support certain conclusions. In January 2024, the inspectors met with site management and on-site radiation protection staff to discuss the inspectors’ concerns. The inspectors provided detailed feedback on each technical basis document and answered questions posed by licensee personnel. TMI-2S captured the inspector’s concerns in CR-2024-0040 and CR-2024-0045. The inspectors conducted a follow-up review of these concerns during an on-site inspection in March of 2024 and found that TMI-2S had formulated an adequate action plan and had mobilized appropriate corporate and vendor resources to correct these important program records. The inspectors will continue to closely monitor the licensee’s progress in future inspections.

In their review of the minor intake of radioactive material while working on the Core Flood Tank, the inspectors found the condition report, personnel contamination report, and associated whole body counts to be adequate and appropriate to the event. The inspectors reviewed the final internal dosimetry evaluation that was conducted for the contaminated radiation worker and determined that the calculated internal dose was less than 10 millirem Committed Effective Dose Equivalent. During the review, the inspectors noted an error in the calculation that was traced back to an error in the associated corporate procedure and resulted in an overestimate of the final internal dose and associated assigned dose. The inspectors also noted that the licensee’s calculation included four hard-to-detect radionuclides yet omitted several other hard-to-detect radionuclides with no documented explanation. The inspectors determined that the impact on the final assigned internal dose for this omission was of minor consequence. TMI-2S captured both concerns in the CAP as actions CRA01-2024-0405 and CRA01-2024-0406.

The inspectors found that TMI-2S maintained an inventory of functional portable radiation protection instruments which was adequate to support licensed activities, and that calibrations and routine performance testing of those instruments followed standard industry practices. The inspectors noted that the availability of instrumentation used to scan for alpha surface contamination could be enhanced by providing a capability to conduct field repairs to the delicate mylar window on that model of instrument. TMI-2S captured the inspector's observation in CR-2024-0372.

The inspectors noted that TMI-2S has deployed a model of continuous air monitor which is sensitive to both beta-gamma and alpha airborne contamination and that this added capability is appropriate to the working environment in the RB. The model selected includes an algorithm which is intended to minimize false alarms due to the presence of naturally occurring Radon and Thoron daughter products (who's concentrations can vary widely with weather and other environmental factors). The inspectors found that the alpha contamination monitoring channel on the continuous air monitors had been made operational during the inspection period and that radiation protection staff was in the process of gathering operational data on the effectiveness of the alpha channel. The inspectors observed that, regardless of the functioning of the alpha channel, the TMI-2S radiation protection program effectiveness would benefit from an effort to collect data on the Radon and Thoron environment on the site, and from a formalization of the protocols to be followed when responding to grab air samples with unexpected alpha radioactivity (who's origin might be from Radon or Thoron). TMI-2S captured the inspector's observation in CR-2024-0372.

The inspectors noted that TMI-2S employed a particularly rigorous process to validate the vendor calibration of both of their high-purity germanium (HPGe) detectors, and to confirm that the instruments provided results which were consistent with other known radiation standards and with other similar units onsite.

The inspectors observed that the analysis for tritium in gaseous effluents was being performed by liquid scintillation analysis through an agreement with the owners of Unit-1, and that the liquid scintillation counter purchased by TMI-2S for Unit-2 was not yet operational. The inspectors observed that the automated smear counter that was purchased for Unit-2 was also not yet operational and that this instrument would add important capabilities to the radiation protection program when placed into service.

The inspectors found that Revision 11 to the Offsite Dose Calculation Manual, which was approved and implemented during the inspection period, contained important changes to the role and function of the gaseous effluent monitors. The inspectors established that the monitors were being surveilled and maintained by TMI-2S as expected based upon the content of Revision 11.

The inspectors determined solid radioactive waste was adequately stored and monitored and worker radwaste training and qualifications were up to date. The inspectors also determined that radioactive waste shipping paperwork was properly completed, and TMI-2S personnel were knowledgeable of their duties and responsibilities. The inspectors determined the licensee's radwaste shipments were in compliance with NRC and DOT regulations. Additionally, the inspector's determined sources were accounted for and have been verified to be intact.

The inspectors noted that the site's exit truck monitor was properly calibrated, and a procedure was in place for use of the monitor, and one was being developed for response checking the monitor daily while in use.
The inspectors observed adequate implementation of both a response check and an efficiency check.

The inspectors determined that TMI-2's work activities were performed safely and in accordance with work plans, plant procedures, ALARA plans, and RWPs with two exceptions described below.

Violation

One Severity Level IV NCV (with two examples) of TMI-2 Technical Specifications because of TMI-2's failure to implement controls for locked high radiation areas (LHRAs) as required by site procedure. Specifically, TMI-2 did not properly implement procedure TMI2-RP4-PR-002, "Controls for High Radiation Areas, Locked High Radiation Areas, Very High Radiation Areas, and Key Control." On August 28, 2023, a worker entered the Containment Air Control Envelope (CACE) building using an incorrect Radiation Work Permit (RWP) and therefore had not received an LHRA radiological briefing to enter the LHRA. Separately, on April 18, 2024, a worker entered the RB on an RWP task that did not allow access to an LHRA after several radiological protection barriers failed.

TMI-2S procedure TMI2-RP4-PR-002, "Controls for High Radiation Areas, Locked High Radiation Areas, Very High Radiation Areas, and Key Control," requires, in part, that access control guards provide positive control over each individual entry and workers must sign onto the appropriate RWP and follow its requirements, including any radiation protection barriers.

Example 1:

On August 28, 2023, a worker was redirected from work in the turbine building to perform an inspection of the scaffolding inside the CACE building. The worker was logged onto RWP 23-2-0106, Task 1, which did not allow access to high radiation areas or LHRAs. The CACE building was conservatively posted and controlled as a LHRA at the time to control access to the adjoining TMI-2 reactor building (RB) through an open rollup door that contained a soft barrier. The LHRA was clearly posted as an LHRA. At the time, the CACE building general area dose rates ranged from <0.1 to 3 mR/hour and the RB general area dose rates ranged from 5 to 600 mR/hour.

The door to the CACE building was unlocked which could allow for worker access with entry into the CACE building controlled by a radiation protection technician acting as an access control guard. The worker presented the access control guard with a "trip ticket," which was written for authorized work under RWP 23-2-0106 and did not document that any LHRA briefing had been performed. The access control guard did not properly verify the worker was on an appropriate RWP to enter the LHRA and therefore did not provide a LHRA briefing. The worker was briefed by the technician on the radiological conditions in the CACE and was permitted entry. The worker was in the CACE building for approximately 20 minutes and received no accumulated dose and entered a maximum dose rate of 2 mR/hour.

TMI-2S entered the issue into their CAP as CR-2023-0261 and implemented corrective actions, including installation of a computer-equipped turnstile at entry points to the RB to restrict access to only those logged onto a RWP with LHRA access. TMI-2S later installed a lock on the roll-up door between the CACE building and Unit 2 RB equipment hatch which allowed the roll-up door to act as the LHRA barrier when closed.

Example 2:

On April 18, 2024, a worker was briefed for RWP 24-2-0420, Rev 1, Task 2, for Unit 2 Ventilation Modification Interference Removal, Install New Duct Work, Shielding and General Area Work, that allowed entry into the RB, an LHRA. The worker signed into an incorrect task, RWP 24-2-0420, Rev 1, Task 1 for “NO RB ENTRY” U2 Basement Ventilation Modification Staging (CACE Building), which had lower dose alarm set points and did not allow entry into LHRAs.

The access control guard for the RB failed to review and adequately check the electronic dosimeter set points to ensure the worker was on the appropriate RWP task for the job. At the RB personnel hatch, workers are supposed to present their electronic dosimetry at the entry (turnstile) of the RB, which verifies the RWP and task and either allows or prohibits entry.

The turnstile was placed into service as a corrective action to the first example of the violation that occurred in the August 2023 unauthorized LHRA entry described above. The worker bypassed the turnstile without RP permission and entered the RB Approximately 20 minutes later, a.

Senior RP technician who was assigned to monitor worker dose at a remote video monitoring station identified that the worker’s bypassed entry had electronic dosimetry set points were not appropriate for the work area and immediately contacted the individual to exit the RB. The worker exited the LHRA and received 0 mrem accumulated dose and 18 mR/hr maximum dose rate.

TMI-2S entered the issue into CAP as CR-2024-0325 and completed immediate corrective actions, which included creating separate RWPs for those that allowed entry into the RB and those that do not, installing a barrier to close any openings between the turnstile and points of entry, and assigning an RP technician to watch all individuals logging onto an RWP for HRA and LHRA entries to ensure that workers log into the correct RWP for their work.

TMI-2 TS Section 6.11 requires, in part, that access to each high radiation area shall be controlled to prevent unauthorized entry. Section 6.11.2 states that high radiation areas with dose rates greater than 1 rem/hr. at 30 centimeters, but less than 500 rad/hr at 1 meter shall remain locked except during periods of access by personnel under an approved RWP, or equivalent, to ensure individuals are informed of the dose rate in the immediate work areas prior to entry. TMI-2S procedure TMI2-RP4-PR-002, “Controls for High Radiation Areas, Locked High Radiation Areas, Very High Radiation Areas, and Key Control,” is part of the TMI-2 radiation protection program used to control access to LHRAs. TMI2-RP4-PR-002 requires, in part, that Access Control Guards provide positive control over each individual entry and workers sign onto the appropriate RWP and follow its requirements, including any radiation protection barriers.

Contrary to the above, TMI-2S failed to control access to a high radiation area, resulting in worker unauthorized entries on August 28, 2023, and April 18, 2024. Specifically, on August 28, 2023, a worker entered a posted LHRA without receiving the required LHRA briefing under an unapproved RWP. Separately, on April 18, 2024, a worker entered a posted LHRA signed onto an inappropriate RWP task and bypassed the established entry point into the RB. In both cases, TMI-2S failed to provide positive control over posted LHRAs, which resulted in two inappropriate entries after the failure of multiple radiation protection barriers.

Because these issues were determined to be of relatively inappreciable potential safety consequences, were entered into the licensee's corrective action program, and were not willful or repetitive, the violation was treated as a non-cited violation, consistent with section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000320/2024002-01, Unauthorized Entries into Locked High Radiation Areas)**

c. Conclusions

One SL IV violation and one Open Item were documented. One Severity Level IV, NCV with two examples of Technical Specifications Section 6.11 was documented and one Open Item for Continued Review of TMI-2's Fire Protection Program was initiated.

3.0 Exit Meeting Summary

On July 18, 2024, the inspectors presented the inspection results to David Delvechio, Project Director, and other members of TMI-2S staff. No proprietary information was retained by the inspectors or documented in this report

SUPPLEMENTARY INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

T. Bell, Chemistry Technician
D. Delvechio, Project Director
S. Eich, Radiation Protection Technician (Constellation, Unit-1)
F. Eppler, Deputy Project Director
J. Lynch, Regulatory Affairs/Licensing Director (D&D)
T. Anderson, ECP Manager
J. Byrne, Licensing Engineer
M. Casey, SME
S. Dang, Radiation Protection Technical Manager
T. Devik. Licensing Manager
D. DiVittore, Radiation Protection Operations Manager
D. Foster, Radiation Protection Technician
B. Gladley, Large Component Project Manager
B. Houtz, Radiation Protection Specialist
D. Jordan, Chemistry Specialist (Constellation, Unit-1)
J. Kacon, Safety Manager
M. Leilous, Operations Maintenance Lead
G. McCarty, Radiation Protection Manager
C. Miltenberger, Nuclear Fuel Manager
D. Morneault, Engineering Manager
L. Neiman, Radiation Protection Technician
J. Norville, Operations, Maintenance, Project Support
H. Pell, Licensing Engineer
C. Reinhart. ECP Representative
A. Spriggle, Fire Marshall
J. Stoltzfus, Fire Protection Engineer
W. Swain, Instruments Technician
C. Whitlow, Radiation Protection Technician

ITEMS OPEN, CLOSED, AND DISCUSSED

Opened	Section	Summary
05000320/2024002-01	2.1. b	Continued Review of TMI-2's Fire Protection Program

PARTIAL LIST OF DOCUMENTS REVIEWED

Audits and Reports

Dosimetry Program, Focused Area Self-Assessment
Self-Assessment, TMI2-RP-FASA-2023-0017, "Instrumentation/Instrumentation Calibration", dated 3/15/202
"TMI2 Initial Prospective Evaluation," dated 6/22/2022
TMI2-EN-RPT-0001, Determination of the Safe Fuel Mass Limit for Decommissioning TMI-2, March 23, 2022
TMI2-QA-AUD-2023-0001, Audit of Radiation Protection Program
TMI2-QA-SCH-2024-0001, TMI 2 Audit and Surveillance Schedule for 2024, Rev. 0

TMI2-RP-RPT-2022-0004, “Site Specific Values for Air Sampling Calculations,” Revision 1
TMI2-RP-RPT-2023-0005, “Addendum to TMI-RP-RPT-2022-0003 TMI-2 Validation of Beta Correction Factor,” dated 4/6/2023
TMI2-RP-RPT-2023-0006, “Requirements for When to Use Specific Lens of the Eye Protection,” dated 4/13/2023
TMI2-RP-RPT-2023-0008, “Internal Dose Assessment Scaling Factors,” Revision 0
TMI2-RP-RPT-2024-0001, “TMI-2 Residential / Home Study and Area TLD Study,” dated. 1/15/2024

Engineering Changes and Work Packages
TMI2-EN-DRL-S-00-004, Design Release, CACE Preparations, Hatch Removal, Enlargement, Rev. 1
TMI2-EN-MPKG-S-00-0010, 10 CFR 50.59 Assessment 2023-0008
TMI2-EN-MPKG-S-00-0033, 10 CFR 50.59 Assessment 2023-0033
TMI2-C-FH-WKPG-1084, Remove FH302 SDS Equipment, Rev. 0
TMI2-C-Gen-WKPG-1053, Enlargement of the Equipment Hatch, Rev. 0
TMI2-C-RB-WKPG-1035, Fuel Transfer Canal Shallow End Cleanout, Rev.1

Procedures and Programs
TMI2-AD-PR-003, TMI-2 Project Operations Review Committee, Rev. 2
TMI2-RP4-PR-002, Controls for High Radiation Areas, Locked High Radiation Areas, Very High Radiation Areas and Key Control, Rev. 3
TMI2-DM-PR-007, Implementation of Defense in Depth Controls for Nuclear Criticality Safety, Rev. 0
TMI2-OP-PR-032, “Operations RMS and Ventilation Checks”, Revision 2
TMI2-RP8-WI-016, Fast Track-Vehicle Monitor Use Guidance, Rev. 0
TMI2-QA-PG-001, Decommissioning Quality Assurance Plan, Rev. 20
TMI2-QA-PN-001, TMI-2 QA Program Implementation, Rev. 2
TMI2-QA-PR-003, TMI-2 Corrective Action Process, Rev. 3
TMI-2-RA-PR-004, TMI2 Employee Concerns Program
TMI2-RA-PR-010, TMI-2 10 CFR 50.59 Assessment, Rev. 1
TMI2-RP1-PG-001, Radiological Protection Program, Rev. 2
TMI2-RP1-PR-006, “Radiation Protection Stop Work Authority,” Revision 0
TMI2-RP2-PR-001, “Dosimetry Issue Change Out and Processing,” Revision 2
TMI2-RP2-PR-006, “Internal Dose Assessment,” Revision 1
TMI2-RP2-PR-007, “Personnel External Exposure Investigations,” Revision 1
TMI2-RP3-PR-001, “ALARA Planning,” Revision 7
RP-AA-228, 10 CFR 50.75(g) and 10 CFR 72.30(f) Documentation Requirements, Revision 6
TMI-2-RP4-PR-003, 10 CFR 50.75(g) and 10 CFR 72.30(d) Documentation Requirements, Revision 0
TMI2-EN-DPL-F-00-0004, Three Mile Island Unit 2 Fire Protection Program Evaluation, Revision 1
TMI2-FP-PN-001, Fire Protection Plan, Revision 1
TMI2-FP-PR-002, Radioactive Material Controls for Fire Protection, Revision 1
TMI2-FP-PR-014, TMI-2 Fire Protection Program Maintenance, Revision 0
TMI2-FP-PR-015, TMI-2 Control of Transient Combustible Material, Revision 1
TMI2-OP-PR-059, TMi-2 Fire Protection System Operation, Response to Fire Alarm in TMI-2 Reactor Building, Revision 0

Condition Reports
ES-TMI-CR-2023- 0002, 0033, 0077, 0112, 0182, 0207, 0211, 0212, 0261; 2024- 0033, 0040,

0041, 0042, 0045, 0048, 0058, 0325, 0374, 0384

Condition Reports Generated from Inspection
ES-TMI-CR-2024- 0040, 0045, 0405, 0406, 0550, 0551

Licensing Documents
Offsite Dose Calculation Manual (ODCM), CY-TM-170-300, Revisions 10 and 11
TMI-2 Defueled Safety Analysis Report, Revision 0
License No. DPR-73 Amendment No. 67

Miscellaneous
ACE IR Evaluations – 1/1/23 thru 1/8/24
Airborne Radioactivity Calculation Worksheet, TMI2-RP-ASA-2023-0657, for lapel air sample on 6/1/2023
ALARA Plan 24-309, 405, 415, 416, 417, 420.
Attachment 5.1 (TMI2-RA-PR-010) Approval of 50.59 Screener/Evaluator – 2 individuals
Calibration package, Mirion FASTSCAN WBC System at TMI-2 dated 1/16/2024
Calibration record, AMP-100, S/N 5021-038 dated 1/19/2024
Calibration record, AMP-200 S/N 7721-014 dated 8/11/2023
Calibration record, Argos-5AB, S/N 1207-124, dated 6/14/2023
Calibration record, Ludlum M2360, S/N 193676 dated 6/23/2023
Calibration record, M43-10 with M2000, S/N PR423693 dated 2/16/2024
Calibration record, PM-7, S/N 714533 dated 7/12/2023
Calibration record, RO20AA, S/N 13677 dated 10/6/2023
Calibration record, SAM11, S/N 714554 dated 3/6/2024
Calibration record, small article monitor (SAM) S/N 714554 dated 3/6/2024
Calibration record, Telepole S/N 427021-129 dated 10/12/2023
Certificate of calibration, iCAM S/N 18012159 detector efficiency
Certificate of calibration, iCAM S/N 18012159 flow element
Condition reports CR-2024-0044, 0048, 0050, 0098, 0259, 0537
Control charts for HPGe gamma spectroscopy detectors DET11456 and DET11545
Data sheet, vendor, for Genesis Ultra TLD-BP Dosimeter and MeasuRing Dosimeter
Detector characterization report, ISOCS/LabSOCS, S/N 11456 dated 12/8/2021
Detector characterization report, ISOCS/LabSOCS, S/N 11545 dated 1/27/2022
Energy calibration reports, routine annual, for HPGe gamma spectroscopy detectors DET11456 and DET11545
FastTrack-Vehicle XL Vehicle Monitor Response check criteria sheet.
FastTrack-Vehicle & FastTrack-Vehicle XL Technical Handbook, June 2021
Form TMI2-RP6-PR-005, Attachment 5.1, log numbers 23-002 & 23-003.
Form TMI2-RP6-PR-006, Attachment 5.3, “CDE and CEDE Determination” associated with log. number 23-003
Inventory list, radiation protection instruments, created 4/24/2024
Laboratory report, GEL Laboratories, LLC, sample delivery groups 596769 & 603612
List of Qualified 50.59 Evaluators, 01/04/2024
Log, instrument maintenance for 2023
Logs, whole body count, dated 3/29/2023 to 12/28/2023.
NRC Safety Evaluation related to Amendment No. 67 to Possession-Only License No. DPR-73 TMI-2 Solutions, LLC
NVLAP accreditation program certificate, Mirion Technologies (GDS), Inc., effective 7/1/2023 to 6/30/2024
Radiation Work Permits 23-2-0106; 24-2-0309, 0416, 0420, 0425

Radiological Surveys 2SS-231213-S-1303, AX000-2302210R-0176, RB200-230315-J-0276, RB203-230601-J-0554, RB200-230606-J-0571, RB200-230607-J-0576, RB203-240221-J-0243, RB200-230316-J-0283, RB400-230105-R-0019
Reactor Building Basement Block Stairwell/Elevator Removal
Shipment Manifest Number MISC-23-0040, MISC-24-0015, MISC-24-0015, LLRW-23-0033, LLRW-24-0002, LLRW-24-0006, LLRW-24-0011
TMI2 Radioactive Source Database
Certificate of Completion, DOT/NRC Radioactive Waste Packaging, Transportation and Disposal Training for: Allen Duncan, James Harris, Abigail Jimenez, Matt Scott.
Rad Material and Rad Waste Storage Areas
Source certificate, source No. 2300, S/N 116484
Source certificate, source No. 2305, S/N BD-7559
Source certificate, source No. 2306, S/N BD-7557
Spreadsheet, “TLD/DRD Comparison for 1Q2023”
Three Mile Island Unit 2 Technical Specifications, Amendment 67
TMI2-OP-PR-030, “RMS (Victoreen) Functional Test”, dated 1/22/2024
TMI2-RP-SURV-2024, FHB 305’ Model Room, February 26, 2024
TMI2-RP-SURV-2024, FHB 305’ Aux, February 27, 2024
Waste Packaging Plan – Debris and Oversized Debris in Intermodals (Rail or Road)
Whole body count records for employee 109517 for event on 6/1/2023
Radiation work permit 2-2024-0417, Revision 0
TMI2-RA-COR-2024-004, Response to Request for Additional Information for the TMI-2 Post-Shutdown Decommissioning Activities Report, Revision 5, March 14, 2024
TMI2-RA-COR-2024-0005, Notification of “Amended Post-Shutdown Decommissioning
User manual, Mirion iCAM Alpha/Beta Continuous Air Monitor
User manual, Mirion RDS-31 S/R Multi-purpose Survey Meter, Version 3.21
Work instruction TMI2-RP8-WI-008, “Operation and Calibration of the PM-12 Gamma Portal Monitor”, Revision 0
Work instruction TMI2-RP8-WI-010, “Operation and Calibration of the Small Article Monitor”, Revision 0
Work order 05101748-01, “2HP-R-225P Cal and Linearity Check”, dated 5/31/2022
Work order 05153052-1, “2HP-R-219 Vacuum and Flow Cal”, dated 10/31/2022
Work order 05169209-01, “2HP-R-219P Cal and Linearity Check”, dated 12/20/2022
Activities Report (PSDAR) for Three Mile Island, Unit 2 in Accordance with 10 CFR 50.82(a)(7),” Revision 6.
TMI2-RA-COR-2024-0006, Decommissioning Trust Fund Annual Report, March 28, 2024
Invoice No. 119500-066 (67590), September 14, 2023
Invoice No. 119500-069 (67849), October 27, 2023
Invoice No. 119500-070 (67850), October 30, 2023
AFR-071, Application for Reimbursement – TMI-2 Solutions TMI-2 Solutions Tax Qualified Nuclear Decommissioning Trust, September 14, 2023
AFR-076, Application for Reimbursement – TMI-2 Solutions TMI-2 Solutions Tax Qualified Nuclear Decommissioning Trust, October 27, 2023
TMI2-FP-5048 -0014, 0022, 0025, 0026, 0030, 0031, 0032, and 0033
ESJ Organization Chart, April 15, 2024

LIST OF ACRONYMS USED

ADAMS	Agency Documentation and Management System
ALARA	As Low As Reasonably Achievable
CACE	Containment Air Control Envelope
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DOT	Department of Transportation
GPO	Government Printing Office
IMC	Inspection Manual Chapter
IP	Inspection Procedure
LHRA	Locked High Radiation Area
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
RB	Reactor Building
RCA	Radiologically Controlled Area
RWP	Radiation Work Permits
PDMS	Post-Defueling Monitored Storage
PSDAR	Post-Shutdown Decommissioning Activities Report
TS	Technical Specifications
TMI-2	Three Mile Island, Unit 2
TMI-2S	TMI-2 Solutions, LLC