TMI-2 SOLUTIONS

October 31, 2022
TMI2-RA-COR-2022-0021

10 CFR 50.90
10 CFR 50.91

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
NRC Possession Only License No. DPR 73
NRC Docket No. 50-320

Subject: License Amendment Request – Three Mile Island, Unit 2, Decommissioning Technical Specifications, Supplement to Response to Request for Additional Information

References:

(1) Letter TMI2-RA-COR-2022-0019 from Lackey, M.B. (EnergySolutions) to Document Control Desk (U.S. NRC), "License Amendment Request – Three Mile Island, Unit 2, Decommissioning Technical Specifications, Response to Request for Additional Information," dated September 29, 2022 (ML22276A024)
(2) Letter to Sauger, J.T. (TMI-2 Solutions, LLC) from Snyder, A.M. (U.S. NRC), "Three Mile Island, Unit 2 – Request for Additional Information for Requested Licensing Action Regarding Decommissioning Technical Specifications," dated July 29, 2022 (ML22210A080, pkg; RAI Enclosure ML22210A088)

This letter supplements TMI-2 Solutions' responses provided in Reference 1 to the NRC's Request for Additional Information (Reference 2).

Attachment 1 supplements TMI-2 Solutions' response to RAI 3. Attachment 2 provides revised Technical Specification (TS) change pages to address RAI 8 which will be incorporated into the amended License Amendment Request (LAR) submittal. Attachment 3 includes a revised List of Regulatory Commitments which supersede the list provided in Reference 1.

In accordance with 10 CFR 50.91(b)(1), a copy of this submittal has been sent to the Commonwealth of Pennsylvania.

NMSS01
NMSS

In the event that the NRC has any questions with respect to the content of this document or wishes to obtain additional information, please contact the TMI-2 Licensing Manager, Mr. Timothy Devik at 603-384-0239, or by email at trdevik@energysolutions.com.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 31 October 2022.

Sincerely,

Michael B_ Lackey

Digitally signed by Michael B_ Lackey
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Attachments:

1. Supplemental Response to RAI 3
2. Supplemental Response to RAI 8 - TS Excerpt Markup
3. Revised List of Regulatory Commitments

cc: w/Attachments

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ATTACHMENT 1

Supplemental Response to RAI 3

THREE MILE ISLAND, UNIT No. 2 – REQUEST FOR ADDITIONAL INFORMATION FOR REQUESTED LICENSING ACTION REGARDING DECOMMISSINING TECHNICAL SPECIFICATIONS EPID: L-2021-LLA-0038

ACCIDENT ANALYSIS:

By letter dated February 19, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21057A046), TMI-2 Solutions, LLC (TMI-2 Solutions or licensee) submitted a License Amendment Request (LAR) to remove certain requirements from the TMI-2 Technical Specifications (TS) that restrict activities in the TMI-2 Reactor Building during Post-Defueling Monitored Storage (PDMS). The licensee would like to progress to actively decommissioning the remaining structures, systems, and components that were contaminated in the 1979 accident. Previously, the licensee had evaluated the impacts of a fire in a High Integrity Container (HIC) containing spent ion exchange resins. Subsequently, the licensee determined that the HIC fire scenario was not representative of the activities that would be occurring during decommissioning and submitted supplemental information on January 7, 2022 (ML22013A177). The U.S. Nuclear Regulatory Commission (NRC) staff provided preliminary questions on the information on February 7, 2022 (ML22038A936). The licensee provided a response on April 7, 2022 (ML22101A077), including references and additional analyses on May 8, 2022 (ML22138A302). This request for additional information (RAI) is in response to the latest information provided.

Fire is one of the largest risks at a nuclear facility (U.S. Department of Energy (DOE), 1994). Fire risk is a product of the likelihood of a fire occurring and the consequences if a fire were to occur. Though minor in impact, fires have occurred at nuclear reactors undergoing decommissioning (e.g., Crystal River, Ft. Calhoun, Indian Point). By the introduction of fuel and energy sources combined with the diverse activities that are necessary to complete decommissioning, the frequency of occurrence of fires has been higher during decommissioning than during operations or, in the case of TMI-2, PDMS.

When responding to RAIs, the licensee may identify alternative approaches such as management controls, procedures, calculations, or conditions that will ensure the impacts from potential fires during decommissioning will meet established criteria for protection of human health.

RAI 3 Offsite Dose Calculations

Comment: The offsite dose calculations lack transparency and traceability.

Basis: Offsite doses resulting from a potential fire were described in TMI2-RA-COR-2022-0007, LAR TMI- 2 "GPU Nuclear Calculation 4440-7380-90-017, Revision 4, PDMS Safety Analysis Report (SAR) Section 8.2.5 Fire Analysis Source Terms") of ML22138A302 (May 13, 2022, Attachment 2). The licensee described modifications to previous calculations (revision 3) to account for additional decay and ingrowth, the presence of additional loose contamination, and use of updated dose conversion factors (revision 4). These changes were sufficiently described and appropriate.

Staff were able to verify the dose conversion factors that were used and most other parameters, as well as the calculated decay and ingrowth. However, the approach taken for the amount of source material (inventory) that is released as a result of the fire was not clear. In revision 3 of the analysis, the amount released was calculated as a product of two factors: the amount of material available and the fraction of available material that was released to the air. The amount of fuel elements available (e.g., Pu, Am) was assumed to be 100 percent or a fraction of 1.0. The amount of Cs and Sr available was assumed to be 1 percent or a fraction of 0.01 for a fire in the reactor basement. These were then multiplied by factors of 8 x 10-4 for actinides and apparently 1.5 x 10-3 for Cs and Sr. Staff could only replicate the basement fire dose of 0.889 mrem by using these factors. The impact is the dose for new ARF of 1.5 x 10-4 does not decrease by a factor of 6.67 but instead would be 0.80 mrem for the basement fire (note RAI #1 on the basis for the ARF).

Path Forward: Please verify the combined factors of material available and airborne fraction released in revision 3 of the fire analysis source terms and update the revision 4 analyses as appropriate.

RESPONSE

TMI-2 Solutions is in the process of re-performing the fire calculation analysis as the bases of the original source term used in the legacy PDMS calculations and subsequent updates referenced above was not able to be located or reproduced.

TMI-2 Solutions will be analyzing the amount of material available for a fire to determine the necessary volume and type necessary to exceed values at the site boundary for a ground release and an elevated release for a given source term. Administrative limits will be placed on the activity content of combustibles available for a fire to limit the fire severity to prevent having a fire that will cause a release corresponding to the dose associated with 2 times the ODCM limit at the site boundary or above. This will ensure that the release levels will remain below the Notice of Unusual Event (NOUE) limit for the site.

Since the new calculation is changing from a non-deterministic analysis to a deterministic analysis a review of an oxy-acetylene explosion to determine the limits of activity inside an enclosure in which cutting operations are to be performed is being developed. A review of the existing Zeolyte drop analysis is also being performed to ensure what the administrative limits are for this incident.

The calculations are being finalized and will go through the TMI-2S acceptance process. It is expected to complete this on or before November 22nd, 2022. Once the calculation is accepted by TMI-2 Solutions, it will be formally transmitted to the NRC via separate letter.

ATTACHMENT 2

Supplemental Response to RAI 8 - TS Excerpt Markup

TECHNICAL SPECIFICATIONS

RAI 8 Annual Effluent Monitoring Report

In TMI-2 Solutions' application, as supplemented, TMI-2 Solutions proposed deletion of this Technical Specification below and relocation to the Decommissioning Quality Assurance Plan:

> ANNUAL RADIOACTIVE EFFLUENT
> RELEASE REPORT
>
> "6.8.1.2 The Annual Radiological Effluent Release Report covering the operation of the ~~unit~~ facility during the previous calendar year shall be submitted before May 1 each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the facility. The material provided shall be (1) consistent with the objectives outlined in the ODCM and (2) in conformance with 10 CFR 50.36a and Section IV. 8.1 of Appendix I to 10 CFR Part 50."

Comment: The licensee did not address the requirement that the annual effluent monitoring reporting is required by regulation to be in the technical specifications.

Basis: As TMI-2 Solutions holds a part 50 license, then Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36a(a)(2), "Technical specifications on effluents from nuclear power reactors," continues to require TMI-2's TS to contain this TS. This is because 50.36a states:

> a) [E]ach licensee of a nuclear power reactor … will include technical specifications that … require that:
>
> (1) …
>
> (2) Each holder of an operating license … shall submit a report to the Commission annually that specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 12 months, including any other information as may be required by the Commission to estimate maximum potential annual radiation doses to the public resulting from effluent releases. The report must be submitted as specified in § 50.4, and the time between submission of the reports must be no longer than 12 months. If quantities of radioactive materials released during the reporting period are significantly above design objectives, the report must cover this specifically. On the basis of these reports and any additional information the Commission may obtain from the licensee or others, the Commission may require the licensee to take action as the Commission deems appropriate.

Path Forward: Therefore, granting TMI-2 Solutions LAR (for removal of TS Section 6.8.1.2) would cause the TS to cease meeting 50.36a(a)(2); the license may only be amended in the requested fashion only if the licensee is first exempted from 50.36(a)(2).

Alternatively, TMI-2 Solutions may supplement its application to request including TS Section 6.8.1.2 in its TS for the staff's consideration in its review of the February 21, 2021 amendment application, as amended. TMI-2 Solutions should include a markup of the proposed TS change, if it decides to pursue this option.

RESPONSE

An excerpt of the Technical Specifications (TS) to retain TS Section 6.8.1.2 is included as a markup in the following pages. TMI-2 Solutions will supplement its License Amendment Request (LAR) under separate cover which will include these proposed TS changes.

Reference

Three Mile Island Nuclear Station Unit 2 (TMI-2), "License Amendment Request – Three Mile Island, Unit 2, Decommissioning Technical Specifications," TMI2-RA-COR-2021-0002, dated February 19, 2021 (ML21057A046)

~~FREQUENCY NOTATION~~

~~1.8 The FREQUENCY NOTATION specified for the performance of surveillance requirements shall correspond to the intervals defined in Table 1.1.~~

~~CONTAINMENT ISOLATION~~

~~1.9 CONTAINMENT ISOLATION shall exist when:~~

~~a. Each penetration is:~~

~~1. Closed by a manual valve, a welded or bolted blind flange, a deactivated automatic valve secured in a closed position or other equivalent mechanical closure to provide isolation of each penetration, or~~

~~2. Open and the pathway to the environment provided with HEPA filter, or~~

~~3. Open in accordance with approved procedures. Controls shall be implemented to minimize the time the penetration is allowed open and to specify the conditions for which the penetration is open. Penetrations shall be expeditiously closed upon completion of the conditions specified in the approved procedures, and~~

~~b. The Equipment Hatch is closed, and~~

~~c. Each Containment Airlock is operable pursuant to Technical Specification 3.1.1.3.~~

~~BATCH RELEASE~~

~~1.10 A BATCH RELEASE is the discharge of a discrete volume.~~

~~CONTINUOUS RELEASE~~

~~1.11 A CONTINUOUS RELEASE is the discharge of a non-discrete volume, e.g., from a volume or system that has an input flow during the continuous release.~~

OFF-SITE DOSE CALCULATION MANUAL

1.12 OFF-SITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of off-site doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain ~~(1) the programs required by Section 6.7.4 and (2)~~ descriptions of the information that should be included in the ~~Annual Radiological Environmental Operating and~~ Annual Radioactive Effluent Release Reports required by Specifications 6.8.1.2 ~~and 6.8.1.3~~.

~~6.7 PROCEDURES AND PROGRAMS (con't)~~

~~1. Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM.~~

~~2. A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of the census, and~~

~~3. Participation in an Interlaboratory Comparison Program to ensure that the independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.~~

6.8 REPORTING REQUIREMENTS

~~ROUTINE REPORTS~~

~~6.8.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be in accordance with 10 CFR 50.4 unless otherwise noted. Some of the reporting requirements of Title 10, Code of Federal Regulations are repeated below.~~

~~ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT~~

~~6.8.1.1 The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) the ODCM and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.~~

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

6.8.1.2 The Annual Radiological Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in the ODCM and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

ATTACHMENT 3

LIST OF REGULATORY COMMITMENTS

The table included in this attachment identifies the regulatory commitments in this document. The type of commitment and associated schedule for implementation are provided. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

Regulatory Commitment	Type		Scheduled Completion Date
	One-Time Action	Continuing Compliance	
TMI-2 Solutions will supplement its License Amendment Request (LAR) under separate cover which will include the proposed Technical Specification changes.	X		November 22, 2022
TMI-2 Solutions will submit calculations to support the source term limitations and controls for RAI 3.	X		November 22, 2022
TMI-2 Solutions will establish a work planning instruction which will evaluate specific hydrogen concerns relevant to a given scope of work and include appropriate hydrogen mitigation measures appropriate for that work.	X		December 31, 2022