

TMI-2 Solutions, Three Mile Island Nuclear Station, Unit No. 2

EXEMPTION FROM 10 CFR 70.24

I. Background

TMI-2 Solutions, LLC, (TMI-2 Solutions or the licensee) is the holder of Possession Only License (POL) No. DPR-73 for Three Mile Island Nuclear Station, Unit No. 2 (TMI-2). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC or the Commission) now or hereafter in effect. The TMI-2 facility is located in Dauphin County, Pennsylvania.

II. Request/Action

Title 10 of the Code of Federal Regulations (10 CFR), Part 70, "Domestic Licensing of Special Nuclear Material", Section 70.24, "Criticality accident requirements", requires that each licensee authorized to possess special nuclear material in a quantity exceeding 700 grams of contained uranium-235, 520 grams of uranium-233, 450 grams of plutonium, 1,500 grams of contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water, or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of either paragraph (a)(1) or (a)(2), as appropriate, and using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs.

Pursuant to the provision of 70.17 (a), "Specific exemptions," the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 70 when the exemptions are authorized by law, will not endanger

life or property or the common defense and security, and are otherwise in the interest of the public. TMI-2 Solutions considers that an exemption to 10 CFR 70.24 for a criticality monitoring system to be appropriate under the licensing basis because TMI2-RA-COR-2022-0008, "Supplemental Information to License Amendment Request- Three Mile Island, Unit 2, Decommissioning Technical Specifications" provides a calculation which shows the SFML associated with remaining fuel bearing material at TMI-2 is 1361 kg UO₂. That SFML is 24% higher than the 1097 kg UO₂ estimate of record for remaining fuel bearing material at TMI-2 which analytically precludes a criticality accident at TMI-2. The 1361 kg UO₂ SFML result represents a significant improvement over the 1990 SFML calculation result. This improvement was achieved by taking credit for impurities and actual enrichment based on the results of physical samples taken during the defueling effort.

Administrative controls for geometric spacing are not necessary to further preclude a criticality accident because there is not enough kg UO₂ at TMI-2 to assemble an optimal critical configuration. However, as part of its Fuel Bearing Material Management Program TMI-2 Solutions will be implementing local administrative controls for the purpose of defense in depth on the activities which will handle the highest quantities of fuel bearing material (e.g., segmenting the reactor vessel internals which represent 925 kg UO₂ or 68% of the SFML). These defense in depth controls will include control on the physical location of segmentation equipment and limiting the number of waste receptacles (i.e., physical manifestations of controls on geometric spacing).

III. Discussion

The exemption is authorized by Law because 10 CFR 70.17(a) states that the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are

authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

The NRC staff has reviewed the exemption request and finds that granting the proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, the Commission's regulations, or other laws. As explained below, the proposed exemption will not endanger life or property, or the common defense and security, and is otherwise in the public interest. Therefore, the exemption is authorized by law. Additionally, the exemption will not endanger life or property or the common defense and security, and is otherwise in the public interest.

The exemption will not endanger life or property because, based on the NRC staff's evaluation ([ML23094A269](#)), the NRC staff determined that the Licensee's proposed decommissioning activities do not present any credible criticality hazards. Because there are no credible criticality hazards related to the Licensee's proposed decommissioning activities and because all activities will be conducted such that subcriticality is assured under normal and all credible abnormal conditions, the NRC staff concludes that the Licensee's program will provide reasonable assurance of adequate protection of the health and safety of workers and the public.

The exemption is consistent with the Common Defense and Security because the NRC staff determined there would be no impact to the physical protection plan, emergency preparedness, environmental monitoring, effluent monitoring, or material control and accountability programs at TMI-2.

As described in the NRC staff's nuclear criticality safety evaluation for this Criticality Exemption Request ([ML22276A024](#)), the NRC staff conducted independent evaluations and

concluded that criticality is not credible; therefore, an exemption from criticality monitoring requirements is warranted. The NRC staff agrees with the licensee's conclusion in its application that the requested exemption to the requirements of 10 CFR 70.24 does not involve information or activities that could potentially impact the common defense and security. The SFML calculation determined that there is no credible criticality hazard, and the existing administrative restrictions described in the TMI-2 Fuel Bearing Material Program prevent proliferation and limit aggregation. The elimination of the criticality monitoring requirements does not involve information or activities that could potentially impact the common defense and security of the United States.

Activities at the TMI-2 site do not pose any credible criticality hazards that would affect the ongoing health and safety of workers or the public, or informing decisions related to nuclear security. Therefore, for the reasons explained above, the exemption will not endanger life or property or the common defense and security.

The exemption is in the public interest because, as stated previously, the Licensee demonstrated that criticality is not credible during site decommissioning activities under credible normal and credible abnormal conditions. Therefore, conducting criticality monitoring at TMI-2 would expend NRC staff inspection and other NRC staff regulatory resources that could be used for other activities at the facility. Additionally, the Licensee states that, if the exemption request were denied, its personnel would experience a slight increase in occupational dose during the maintenance of criticality monitors, which would not be consistent with as low as reasonably achievable (ALARA) principles. The NRC staff agrees.

IV. Conclusions

Accordingly, the Commission has determined that, pursuant to 10 CFR Part 70, the exemption is authorized by law, will not present an undue risk to the public health and safety,

and is consistent with the common defense and security. Therefore, the Commission hereby grants TMI-2 Solutions, LLC an exemption from 10 CFR part 70, Section 24 during decommissioning.

Dated: May 02, 2023.

For the Nuclear Regulatory Commission.

/RA/

Jane E. Marshall, Director,
Division of Decommissioning, Uranium Recovery
and Waste Programs,
Office of Nuclear Material Safety
and Safeguards.

SUBJECT: THREE MILE ISLAND STATION, UNIT NO. 2, EXEMPTION FROM
 10 CFR 70.24. DATED: MAY 02, 2023

DISTRIBUTION:

PUBLIC
 JMarshall, NMSS
 JGroom, NMSS
 SAnderson, NMSS
 ASnyder, NMSS
 JPiotter, NMSS
 JWeil, NMSS/DFM
 DMcIntyre, OPA
 ADimitriadis, RI
 DTift, RI
 SHamann, RI
 CWolf, OCA
 RidsRgn1MailCenterResource

ADAMS Accession Nos.: ML23026A233

***via eConcurrence**

OFFICE	NMSS/DUWP/RDB/PM	NMSS/DUWP/RDB/BC	OGC
NAME	*ASnyder	*SAnderson	TJones
DATE	02/03/2023	05/01/2023	05/01/2023
OFFICE	NMSS/DUWP/RDB/PM	NMSS/DUWP/D	
NAME	*ASnyder	*JMarshall	
DATE	05/02/2023	05/02/2023	

OFFICIAL RECORD COPY