[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-0320; NRC-2023-0042]

TMI-2 Solutions

Three Mile Island Nuclear Station, Unit No. 2

AGENCY: Nuclear Regulatory Commission.

ACTION: Exemption; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC, or Commission) is issuing an exemption in response to a September 29, 2022, request from TMI-2 Solutions, LLC (TMI-2 Solutions, or Licensee) for an exemption from NRC regulations. The action exempts TMI-2 Solutions from the requirements to maintain a radiation monitoring system in each area where licensed special nuclear material is handled, used, or stored that would energize clearly audible alarm signals if accidental criticality occurred during decommissioning. In evaluating the exemption request, the NRC staff determined that the Licensee's proposed decommissioning activities do not present any credible criticality hazards.

DATES: The exemption was issued on and was effective on May 2, 2023.

ADDRESSES: Please refer to Docket ID **NRC-2023-0042** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Website:** Go to https://www.regulations.gov and search for Docket ID **NRC-2023-0042**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the "For Further Information Contact" section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at https://www.nrc.gov/reading-rm/adams.html. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by email to PDR.Resource@nrc.gov. The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.
- **NRC's PDR:** You may examine and purchase copies of public documents, by appointment, at the NRC's PDR, Room P1 B35, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Amy M. Snyder, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone: 301-415-6822, email: Amy.Snyder@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Background

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

The NRC previously granted TMI-2 an exemption from the criticality accident monitoring requirements of section 70.24 of title 10 of the *Code of Federal Regulations* (10 CFR), "Criticality accident requirements," for Special Nuclear Material (SNM) storage, on June 15, 1992 (ADAMS Accession No. ML20210D729). In its exemption

request (ADAMS Accession No. ML22276A024), the Licensee noted that the June 15, 1992, exemption stated:

> "... it is appropriate to request an exemption from 10 CFR 70.24 if an evaluation determines that a potential for criticality does not exist, as for example where the quantities or form of special nuclear material make criticality practically impossible or where geometric spacing is used to preclude criticality."

The NRC granted the 1992 exemption based on the lack of a credible criticality hazard related to the storage of fissionable material at the facility (ADAMS Package Accession No. ML20210D728). That exemption, however, only covered the initial cleanup of TMI-2 fuel debris. Consequently, as TMI-2 Solutions progresses to radiological decommissioning of TMI-2, including activities beyond the initial cleanup of TMI-2 fuel debris, the 1992 exemption will no longer apply. Therefore, TMI-2 Solutions requested this exemption from 10 CFR 70.24, which will extend until license termination.

II. Request/Action

Section 70.24 requires, in relevant part, 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, or 450 grams of any combination thereof, shall maintain a monitoring system in each area in which such licensed special nuclear material is handled, used, or stored. The monitoring system must use gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs.

In its exemption application, TMI-2 Solutions states that criticality is not credible at TMI-2, and therefore it considers an exemption to 10 CFR 70.24 for a criticality monitoring system to be appropriate for decommissioning. The licensee states that

TMI2-RA-COR-2022-0008, “Supplemental Information to License Amendment Request-Three Mile Island, Unit 2, Decommissioning Technical Specifications,” demonstrates that the spent fuel mass limit (SFML) associated with remaining fuel bearing material at TMI-2 is 1361 kilograms (kg) of uranium oxide (UO_2). The licensee notes that this SFML is 24 percent higher than the previous estimate on record for remaining fuel bearing material at TMI-2, which the NRC staff found to analytically preclude a credible criticality accident at TMI-2 (ADAMS Accession No. ML23094A269). The updated SFML result represents a more accurate and updated calculation from the 1990 SFML calculation. The Licensee arrived at this updated calculation by taking credit for impurities and actual enrichment based on the results of physical samples taken during the defueling effort.

III. Discussion

Pursuant to 10 CFR 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 exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the interest of the public.

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 as follows, 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.

The exemption presents no undue risk to the public health and safety and therefore will not endanger life or property. Based on the NRC staff’s evaluation, 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. Further, as described in the NRC staff's safety evaluation, 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 Licensee demonstrated 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.

Further, while administrative controls for geometric spacing are not necessary because there is not enough UO_2 to assemble an optimal critical configuration, TMI-2 Solutions will be implementing local administrative controls as part of its Fuel Bearing Material Management Program for the purpose of defense in depth. These administrative controls will apply to the activities which will handle the highest quantities of fuel bearing material (e.g., segmenting the reactor vessel internals which represent 925 kg UO_2 or 68 percent 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).

Finally, the NRC staff concludes that the exemption is in the public interest. 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 principles. The NRC staff agrees.

IV. Conclusions

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.17(a), the exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the interest of the public. Therefore, the Commission hereby grants TMI-2 Solutions an exemption from 10 CFR 70.24 during decommissioning.

Dated: June 26, 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.