UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 9, 2023

Dr. Robert Dimeo, Director
National Institute of Standards and
Technology
NIST Center for Neutron Research
U.S. Department of Commerce
100 Bureau Drive, Mail Stop 6100
Gaithersburg, MD 20899-6100

SUBJECT: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY – AUTHORIZATION TO RESTART FOLLOWING EXCEEDANCE OF THE SAFETY LIMIT (EPID L-2021-LLN-0000)

Dear Dr. Dimeo:

This letter is to inform you that the U.S. Nuclear Regulatory Commission (NRC, the Commission) staff is authorizing the restart of the National Institute of Standards and Technology (NIST, the licensee) National Bureau of Standards test reactor (NBSR, the facility) in response to your restart request dated October 1, 2021, as supplemented. The Maryland State official was notified of the pending restart determination on February 24, 2023. The State official did not provide any comments (Agencywide Documents Access and Management System Accession No. ML23058A060).

On February 3, 2021, during a startup and approach to full power, the NBSR experienced conditions that resulted in an exceedance of its safety limit. The NRC regulations in Title 10 of the *Code of Federal Regulations* section 50.36, "Technical specifications," paragraph (c)(1)(i)(A) state, in part: "If any safety limit is exceeded, the reactor must be shut down. The licensee shall notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. Operation must not be resumed until authorized by the Commission." NBSR technical specification (TS) 6.6.1, "Actions to Be Taken in the Event the Safety Limit is Exceeded," also states, in part, that "[t]he reactor shall be shutdown and reactor operations shall not be resumed until authorized by the NRC," and that the licensee shall make reports to the NRC that "shall include an analysis of the causes and extent of possible resultant damage, efficacy of corrective action, and recommendations for measures to prevent or reduce the probability of recurrence." Because the February 3, 2021, event resulted in the NBSR exceeding its safety limit, the NBSR was required by regulation and TS to be shut down and facility operation could not be resumed until authorized by the Commission. The licensee was required to provide to the NRC an evaluation of the event, its causes and impacts, and the basis for corrective actions taken to preclude recurrence of the event.

By letter dated October 1, 2021, as supplemented by letters dated October 21, 2021, and December 3, 2021, NIST submitted to the NRC a restart request for the NBSR including an evaluation of the February 3, 2021, event, the event's root causes, and corrective actions to preclude recurrence. NIST provided further supplements by letters dated June 29, 2022,

August 15, 2022, and November 17, 2022, discussing the completion of actions necessary to support restart.

The enclosed technical evaluation report (TER) documents the NRC staff's review of the February 3, 2021, event and the licensee's subsequent corrective actions and outlines the basis for the NRC's authorization to restart the NBSR. The NRC staff conducted a detailed technical review of the impacts of the event on the NBSR structures, systems, and components to ensure that there is no functional damage to preclude safe operation of the facility. The NRC staff also evaluated NIST's procedures and practices to ensure that they provide reasonable assurance that the reactor will be operated consistent with its license and the NRC's regulations. Furthermore, the NRC staff and NIST agreed to a series of additional corrective actions in response to the violations identified in relation to the event. These actions are memorialized in a confirmatory order dated August 1, 2021, and the NRC continues to provide enhanced oversight of the facility. The TER documents the NRC staff's review in each of these areas, along with other factors considered in the restart decision.

Based on its review documented in the TER, the NRC staff has determined that the results of the licensee's review regarding the cause of the February 3, 2021, event and the basis for corrective action taken or committed to be taken to preclude recurrence of the exceedance of the safety limit, demonstrate that restart would be in accordance with the facility's license and NRC regulations. Therefore, the NRC staff concludes that the resumption of operation of the NBSR will not be inimical to the common defense and security or to the health and safety of the public and, accordingly, authorizes the restart of the NBSR, effective immediately.

If you have any questions, please contact Patrick Boyle, Project Manager, at (301) 415-3936 or by email to Patrick.Boyle@nrc.gov.

Sincerely,

Andrea Veil Signed by Veil, Andrea on 03/09/23

Andrea Veil, Director
Office of Nuclear Reactor Regulation

Docket No.: 50-184
License No.: TR-5

Enclosure:
As stated

cc w/enclosure: See next page

cc:

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SUBJECT: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY – AUTHORIZATION TO RESTART FOLLOWING EXCEEDANCE OF THE SAFETY LIMIT (EPID L-2021-LLN-0000) DATED MARCH 9, 2023

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