May 15, 2017

Dr. Robert Dimeo, Director
NIST Center for Neutron Research
National Institute of Standards and Technology
U. S. Department of Commerce
100 Bureau Drive, Mail Stop 8561
Gaithersburg, MD 20899-8561

SUBJECT: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, NON-ACCEPTANCE OF AMENDMENT REQUEST WITH OPPORTUNITY TO SUPPLEMENT, FOR THE RENEWED FACILITY LICENSE NO. TR-5 FOR THE NATIONAL BUREAU OF STANDARDS TEST REACTOR (TAC NO. MF9371)

Dear Dr. Dimeo:

By letter dated March 2, 2017 (Agencywide Documents Access and Management System ML17068A164), the National Institute of Standards and Technology (NIST) submitted a license amendment request (LAR or application) for the NIST Center for Neutron Research Test Reactor. The proposed LAR would modify the technical specifications (TSs) to remove apparent limitations in the present version of the TSs that prohibit use of a test procedure and would change the organizational chart. In addition, the proposed LAR would allow transfer of instrumentation calibration and testing sources from a materials license to the reactor license.

The purpose of this letter is to provide the results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of this LAR. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the LAR has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the facility.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the TSs) must fully describe the changes requested, and follow as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff requests that you supplement the application to address the information requested in the enclosure within fifteen (15) days from the date of this letter. This will enable the NRC staff to begin its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC staff will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter were discussed with Dr. Thomas Newton of your staff on May 8, 2017.

If you have any questions, please contact me at (301) 415-1404, or by electronic mail at Xiaosong.Yin@nrc.gov.

Sincerely,

/RA/

Xiaosong Yin, Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-184

License No. TR-5

Enclosure:
As stated

cc: w/enclosure: See next page

cc:

Director, Department of State Planning
301 West Preston Street
Baltimore, MD 21201

Director, Air & Radiation Management Adm.
Maryland Dept. of the Environment
1800 Washington Blvd., Suite 710
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Director, Department of Natural Resources
Power Plant Siting Program
Energy and Coastal Zone Administration
Tawes State Office Building
Annapolis, MD 21401

President
Montgomery County Council
100 Maryland Avenue
Rockville, MD 20850

Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

SUBJECT: NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, NON-ACCEPTANCE OF AMENDMENT REQUEST WITH OPPORTUNITY TO SUPPLEMENT TO THE RENEWED FACILITY LICENSE NO. TR-5 FOR THE NATIONAL BUREAU OF STANDARDS TEST REACTOR (TAC NO. MF9371) DATED: May 15, 2017

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OFFICE OF NUCLEAR REACTOR REGULATION

SUPPLEMENTAL INFORMATION NEEDED FOR

LICENSE AMENDMENT REQUEST

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

CENTER FOR NEUTRON RESEARCH

LICENSE NO. TR-5; DOCKET NO. 50-184

1) The proposed amendment refers to an "unknown core" loading and gives examples. Are the neutronics, thermal-hydraulics and compliance of the core with the TSs of "unknown cores" unknown? Discuss the modeling performed to predict core behavior before core loading including compliance with TS requirements. Discuss the attributes of your core loading procedures (hold points, intermediate acceptance criteria) that help ensure that the "unknown core" is within the licensing basis and compliant with the TSs.

2) The proposed amendment implies that natural convection operation would only occur for "unknown core" loading. If this is true, your proposed TS should include this restriction. If not true, the difference between "unknown core" activities and normal natural convection mode operation needs to be described in your application and reflected in your proposed TSs.

3) You proposed that TS 2.2(2) not be applicable to natural convection operation. Provide a safety analysis or a reference to your existing safety analysis that shows that a limit on coolant temperature in natural convection mode operation is not needed.

4) Some TSs discussed in your application do not appear to have any proposed changes to the specifications (e.g. TS 3.1.2). Confirm what changes you are proposing to the TSs.

5) It is not clear if you are requesting that some TSs (e.g., 3.1.2, 3.2.1 (3)) not be applicable during operation with an "unknown core" or if compliance can be shown by calculations or other means until measurements can be taken. Clarify what you are proposing and submit a safety analysis to support your request.

6) The basis of proposed TS 3.1.3 is changed to remove shim arm failure. Confirm that the shim arm stops will continue to be able to perform their function during forced convection operation. One of the "unknown core" activities in your application is shim replacement. How would operators know that a shim arm had failed in natural convection mode operation with open grid positions that prevented the shim arm stops from performing their function.

7) Several proposed TS changes discuss the reflector dump. Clarify the heavy water levels used in the application. Explain the reactivity difference from dumping the reflector from difference starting levels (e.g., 154 inches and 70 inches).

8) The proposed basis added for TS 3.9.2.1 stated that "[U]ntil main pump flow is used the flow forces are not present to cause the lifting of the elements if they are not latched." Explain how a fuel element is confirmed to be properly seated without latching it and what is the

mechanism verifying it. What prevents operation of the primary cooling system when the reactor is in natural convection mode? Perform a safety analysis to support this statement.

9) Your application contains a section discussing change of the basis for TS 3.7.1(1). However, it appears you have not proposed any changes to the TS. Provide your proposed revised wording.