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

June 10, 2021

Dr. Ayman I. Hawari, Director
Nuclear Reactor Program
Department of Nuclear Engineering
North Carolina State University
Campus Box 7909
2500 Stinson Drive
Raleigh, NC 27695-7909

SUBJECT: NORTH CAROLINA STATE UNIVERSITY – REGULATORY AUDIT RE: LOSS-OF-COOLANT ACCIDENT DESCRIBED IN THE FACILITY OPERATING LICENSE RENEWAL APPLICATION (EPID NO. L-2020-NFR-0007)

Dear Dr. Hawari:

By letter dated February 24, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17088A819), as supplemented by letter(s) dated July 17, 2018, November 1, 2018, February 14, 2019, June 21, 2019, September 25, 2019, March 24, 2020, and May 26, 2020 (ADAMS Accession Nos. ML18201A200, ML18312A303, ML19046A031, ML19221B602, ML19269B706, ML20084K704, and ML20149K759, respectively) North Carolina State University (NCSU) submitted an application to renew the Facility Operating License No. R-120 for the NCSU PULSTAR Nuclear Research Reactor in accordance with the requirements contained in Title 10 of the *Code of Federal Regulations* Part 50, "Domestic Licensing of Production and Utilization Facilities." The requested licensing action would renew the facility operating license for a period of 20 years.

To support its review of the PULSTAR loss-of-coolant accident described in NCSUs license renewal application, the U.S. Nuclear Regulatory Commission (NRC) staff will conduct a virtual regulatory audit on June 16, 2021, to gain a better understanding of the application and any proposed changes to the facility. This audit is a continuation of the license renewal audit and may include NRC staff review of documentation and discussions with facility personnel and management. The audit plan in Enclosure 1 provides additional details of the objective and scope of the audit. To facilitate an efficient audit, please provide ready access to necessary documentation related to the audit topics stated in Enclosure 2 (ADAMS Accession No. ML21158A278).

Following completion of this audit, the NRC staff will provide an audit summary. The summary will include a description of any information identified during this audit that will need to be

docketed to supplement the application and allow the NRC staff to continue its review. If you have any questions, please contact me at (301) 415-3724, or by electronic mail at Duane.Hardesty@nrc.gov.

Sincerely,

Signed by Hardesty, Duane on 06/10/21

Duane A. Hardesty, Senior Project Manager
Non-Power Production and Utilization Facility Licensing Branch
Division of Advanced Reactors and Non-Power Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-297
License No. R-120

Enclosures:
As stated

cc: See next page

cc:

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Test, Research and Training
Reactor Newsletter
Attention: Amber Johnson
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Gerald Wicks, CHP Reactor Health Physicist
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DATED: June 10, 2021

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ADAMS Accession No. ML21158A277 **NRR-106**

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DATE	06/08/2021	06/09/2021	06/10//2021	06/10/2021

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OFFICE OF NUCLEAR REACTOR REGULATION

REGULATORY AUDIT PLAN

REGARDING RENEWAL OF

FACILITY OPERATING LICENSE NO. R-120

NORTH CAROLINA STATE UNIVERSITY

PULSTAR NUCLEAR RESEARCH REACTOR

DOCKET NO. 50-297

Background

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing its review of the North Carolina State University (NCSU) PULSTAR Nuclear Research Reactor license renewal application (LRA) and power increase, by letter dated February 24, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17088A819), as supplemented by letters dated July 17, 2018, November 1, 2018, February 14, 2019, June 21, 2019, September 25, 2019, March 24, 2020, and May 26, 2020 (ADAMS Accession Nos. ML18201A200, ML18312A303, ML19046A031, ML19221B602, ML19269B706, ML20084K704, and ML20149K759, respectively). This regulatory audit is intended to assist the NRC staff in its review of the LRA.

Regulatory Bases for the Audit

The purpose of this audit is to support the NRC staff's review of the licensee's loss-of-coolant accident (LOCA) in accordance with the applicable regulatory requirements of Title 10 of the *Code of Federal Regulations* and applicable guidance provided in NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," Part 1, "Format and Content," and Part 2, "Standard Review Plan and Acceptance Criteria," (ADAMS Accession Nos.: ML042430055 and ML042430048, respectively).

Regulatory Scope for the Audit

The NRC staff will review the PULSTAR final safety analysis report (FSAR), technical specification (TS) requirements, and supporting reference documentation related to the PULSTAR LOCA topics. This audit will provide information necessary to continue the NRC staff's evaluation of the NCSU application for the license renewal. In addition, the regulatory audit may identify additional information that will be required to be docketed to support the basis of the licensing decision and will allow NRC staff to more efficiently gain insights on the LRA To support this audit, the NRC staff will review documentation and participate in teleconference and video conference discussions with the licensee.

Information Needed for the Audit

The NCSU staff should be prepared to support the NRC staff by having a copy of the PULSTAR FSAR, including information related to the LOCA topics readily available. Additionally, the licensee should be prepared to provide supporting documents and reports to support the analysis documented in the FSAR, bases for TSs, or rationale for any required plans and procedures, as necessary. Additionally, the licensee should be prepared to provide supporting documents and reports, calculations, and computer code verification to support the analysis documented in the FSAR, bases for TSs, or rationale for any required plans and procedures.

Audit Team

The NRC staff performing this audit will be:

- Duane Hardesty (Audit Leader and Project Manager)
- Joseph Staudenmeier (Technical Reviewer)
- Benjamin Parks (Technical Reviewer)
- Robert Beaton (Technical Reviewer)
- Richard Clement (Technical Reviewer)
- Sunil Weerakkody (Technical Reviewer)

Audit Team Logistics

The audit will initiate on June 16, 2021. The audit may be extended, as needed, until the NRC staff has an adequate understanding of the issues to be addressed to facilitate the continued review of the LRA. Audit activities may be conducted as teleconferences and video conferences, as appropriate and efficient to the gathering of information by the NRC staff. Additional audit activities may be planned in advance, as necessary, to support the understanding of information necessary to facilitate the continued review of the LRA.

Deliverables

At the completion of the regulatory audit the NRC staff will issue requests for additional information within 30 days after the audit and issue a regulatory audit summary within 90 days after the audit. The regulatory audit summary will include the documents reviewed and the audit activities performed.

Audit Topics and Questions:

The topics and questions for discussion during the regulatory audit are primarily based on the regulatory audit topics (ADAMS Accession No. ML21158A278).

Proposed Audit Schedule

Wednesday, June 16, 2021

1:00 PM	Entrance meeting and introductions
1:30 PM	Audit discussions
4:00 PM	Summary and exit meeting
4:30 PM	End audit