



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

November 5, 2019

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

SUBJECT: NORTH CAROLINA STATE UNIVERSITY. – REGULATORY AUDIT RE:
LICENSE RENEWAL AND POWER INCREASE OF THE PULSTAR RESEARCH
REACTOR (EPID NO. L-2017-RNW-0026)

Dear Dr. Hawari:

By letter dated March 29, 2017 (Agencywide Documents Access and Management System Accession No. ML17088A818), as supplemented, North Carolina State University (NCSU) applied for license renewal and power increase of Facility Operating License No. R-120 for the PULSTAR Research Reactor.

The U.S. Nuclear Regulatory Commission (NRC) staff will conduct an onsite regulatory audit to review the NCSU license renewal application (LRA) beginning November 12, 2019 and continuing as necessary to address the NRC staff's audit questions (ADAMS Accession No. ML19308C762). The intent of the audit is to gain a better understanding of your LRA, including the proposed power increase and changes to your facility. In addition, the regulatory audit will identify information that will support the basis of the licensing decision, need to be docketed, and will allow the NRC staff to more efficiently gain insights necessary to complete the review of the NCSU LRA. The NRC staff has provided a copy of the audit plan as an enclosure to this letter.

At the completion of the regulatory audit, a regulatory audit summary will be prepared and provided to you. If necessary, you will have the opportunity to supplement the application to provide additional information or the option to withdraw the application.

We appreciate your support in providing space, the requested documentation and access to the necessary personnel and other materials that will assist in an efficiently conducted audit.

A. Hawari

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If you have any questions regarding the NRC staff's audit, please contact me at contact me at 301-415-3724, or by electronic mail at Duane.Hardesty@nrc.gov.

Sincerely,

/RA/

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

Enclosure:
As stated

North Carolina State University

Docket No. 50-297

cc:

Office of Intergovernmental Relations
116 West Jones Street
Raleigh, NC 27603

Dr. Kostadin Ivanov, Head
Department of Nuclear Engineering
North Carolina State University
Campus Box 7909
Raleigh, NC 27695-7909

W. Lee Cox, Section Chief
Department of Health and Human Services
Division of Health Service Regulation
Radiation Protection Section
1645 Mail Service Center
Raleigh, NC 27699-1645

Dr. Louis Martin-Vega, Dean
College of Engineering
North Carolina State University
113 Page Hall
Campus Box 7901
Raleigh, NC 27695-7901

Gerald Wicks, CHP
Reactor Health Physicist
Department of Nuclear Engineering
North Carolina State University
Campus Box 7909
2500 Stinson Drive
Raleigh, NC 27695-7909

Andrew T. Cook
Manager of Engineering and Operations
Nuclear Reactor Program
Department of Nuclear Engineering
North Carolina State University
Campus Box 7909
2500 Stinson Drive
Raleigh, NC 27695-7909

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: NORTH CAROLINA STATE UNIVERSITY. – REGULATORY AUDIT RE:
 LICENSE RENEWAL AND POWER INCREASE OF THE PULSTAR
 RESEARCH REACTOR (EPID NO. L-2017-RNW-0026)
 DATE: NOVEMBER 5, 2019

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ADAMS Accession No. ML19308C717 *concurrent via email

NRR-106

OFFICE	NRR/DANU/UNPL/PM*	NRR/DANU/UNPL/LA*	NRR/DANU/UNPL/BC
NAME	DHardesty	NParker	GCasto
DATE	11/5/2019	11/5/2019	11/5/2019

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NUCLEAR REGULATORY COMMISSION
REGULATORY AUDIT PLAN FOR THE
NORTH CAROLINA STATE UNIVERSITY PULSTAR RESEARCH REACTOR
LICENSE RENEWAL AND POWER INCREASE
RALEIGH, NORTH CAROLINA
NOVEMBER 12-15, 2019

Background

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing its review of the North Carolina State University (NCSU) PULSTAR Research Reactor license renewal application (LRA) and power increase, dated March 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17088A818), as supplemented by letters dated November 1, 2018, and February 14, 2019, August 9, 2019, and September 25, 2019 (ADAMS Accession Nos.: ML18312A302, ML19046A030, ML19221B596, and ML19269B705 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 determine if the licensee's proposed LRA to renew the operating license for 20 years and increase the facility maximum operating power to 2,000 kilowatts (thermal) continues to meet all the applicable regulatory requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) and addresses 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 tour the facility to gain further understanding of the LRA, review the current PULSTAR safety analysis report (SAR) design bases and technical specification (TS) requirements that help to ensure safe operations, and review processes and procedures for the safe operation of the PULSTAR facility. This audit will provide information necessary to complete the NRC staff's evaluation of the LRA. 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 license renewal and power increase.

To support this audit, the NRC staff will visit the PULSTAR facility in Raleigh, NC.

Information Needed for the Audit

NCSU staff should be prepared to support the NRC staff with a comprehensive tour of the facility. A copy of the licensee's current and proposed SAR, TSs, Physical Security Plan, Emergency Plan, Operator Requalification Program, and Operating Procedures should also be readily available to the NRC staff. Additionally, the licensee should be prepared to provide supporting documents and reports, calculations, and computer code verification to support the

analysis documented in the SAR, bases for TSs, or rationale for any required plans and procedures.

The NRC audit team also requests to observe a pre-start check, start-up to power and shutdown, if that can be arranged in the timeframe we are onsite.

Audit Team

The NRC staff performing this audit will be:

- Duane Hardesty (Audit Leader and Technical Reviewer)
- Edward Helvenston (Technical Reviewer)
- Richard Clement, (Technical Reviewer)
- Alexander Adams, Jr. (Technical Reviewer)

Audit Team Logistics

The onsite audit will initiate on November 12, 2019, and continue through November 15, 2019, as needed, and continue as necessary until staff have adequate understanding of issues to be addressed to complete the review of the LRA. Audit activities may be conducted as onsite review meetings and teleconference and video conference supported activities, as appropriate and efficient to the gathering of information by the NRC staff. For the initial meeting, an onsite review meeting is planned, including a tour of the facility and a review of the information described above. The audit period may be reduced or extended, dependent on the NRC staff and licensee progress in addressing audit questions. Additional audit activities may be planned in advance, as necessary, to support the understanding of information necessary to complete the review of the LRA. It is expected that more interaction will be needed to identify information requests to support LRA review activities.

Deliverables

At the completion of the regulatory audit the NRC staff will prepare a regulatory audit summary, which will be issued within 90 days after the audit. The regulatory audit summary will include the documents reviewed, the audit activities, and any requests for additional information that were discussed or that will be issued based on the audit, as applicable.

Audit Questions:

The questions for discussion during the Audit are primarily based on the license renewal open items list provided as an attachment to this letter (ADAMS Accession No. ML19308C762). The NRC staff will use the open items list during the audit to discuss and close the items identified for discussion during the audit. At the conclusion of the audit, necessary requests for additional information (RAI) will be drafted to ensure the licensee has a clear understanding of the RAI scope.

Proposed Audit Schedule

Tuesday, November 12, 2019

1:00 PM Arrive at NCSU
1:30 PM Entrance meeting, introductions, and project status
2:00 PM Audit
5:00 PM End for the day

Wednesday, November 13, 2019

8:00 AM Resume Audit
8:30 AM Facility tour and observe plant operations
12:00 PM Break for lunch
1:00 PM Resume Audit
5:00 PM End for the day

Thursday, November 14, 2019

8:00 AM Resume Audit
12:00 PM Break for lunch
1:00 PM Resume Audit
4:00 PM Exit Meeting
4:30 PM Conclude Audit

Notes:

1. The tour and observation of plant operations can be moved as needed to accommodate NCSU operations.
2. The plan is that the Audit will be completed on Thursday, November 14, 2019. However, Friday, November 15, 2019, is reserved, if needed, to complete Audit activities or conduct additional activities identified during the Audit.