

August 15, 2006

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

SUBJECT: ISSUANCE OF AMENDMENT NO. 16 TO FACILITY OPERATING LICENSE
NO. R-120 — NORTH CAROLINA STATE UNIVERSITY PULSTAR
NUCLEAR REACTOR (TAC NO. MC8420)

Dear Dr. Hawari:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 16 to Facility Operating License No. R-120 for the PULSTAR nuclear reactor operated by North Carolina State University (NCSU). This amendment is in response to NSCU's letter dated April 25, 2005 (Agencywide Documents Access and Management System Accession No. ML061220325), which withdraws your request dated September 21, 2005 (Accession No. ML052690085), and makes a new request for amendment.

The amendment permits receipt, possession, and use of byproduct material. A copy of the safety evaluation supporting Amendment No. 16 is also enclosed.

Should you have any questions on this amendment, I would be pleased to hear from you. My telephone number is (301) 415-1631.

Sincerely,

/RA/

Daniel E. Hughes, Project Manager
Research and Test Reactors Branch A
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-297

Enclosures: 1. Amendment No. 16
2. Safety Evaluation

cc w/encls: See next page

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

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NORTH CAROLINA STATE UNIVERSITY

DOCKET NO. 50-297

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 16
License No. R-120

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that
 - A. The application for an amendment to Facility Operating License No. R-120 filed by the North Carolina State University (the licensee) on April 25, 2006, conforms to the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the regulations of the Commission as stated in Chapter I of Title 10 of the *Code of Federal Regulations* (10 CFR);
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance that (i) the activities authorized by this amendment can be conducted without endangering the health and safety of the public and (ii) such activities will be conducted in compliance with the regulations of the Commission;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;
 - E. This amendment is issued in accordance with the regulations of the Commission as stated in 10 CFR Part 51, and all applicable requirements have been satisfied; and
 - F. Prior notice of this amendment was not required by 10 CFR 2.105 and publication of a notice for this amendment is not required by 10 CFR 2.106.

2. Accordingly, Facility Operating License No. R-120 is hereby amended, as follows:

a. Paragraph 2.B.(4) of the license shall be amended to read as follows:

(4) Pursuant to the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to receive, possess, and use in connection with operation of the facility:

(a) any amount of byproduct material in the form of reactor components or otherwise integral to the reactor or reactor experimental facility;

(b) byproduct material which is to be irradiated in the reactor within 31 days of receipt.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Brian E. Thomas, Chief
Research and Test Reactors Branch A
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Date of Issuance: August 15, 2006

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 16 TO

FACILITY OPERATING LICENSE NO. R-120

NORTH CAROLINA STATE UNIVERSITY

DOCKET NO. 50-297

1.0 INTRODUCTION

By letter dated April 25, 2006, North Carolina State University (NCSU or the licensee) requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) amend Facility Operating License No. R-120 for the PULSTAR Research Reactor. The requested changes would modify the byproduct material possession limits established by the facility operating license.

2.0 BACKGROUND

The licensee is authorized to operate the PULSTAR Research Reactor at steady-state power levels not in excess of 1 megawatt thermal. The reactor is located on the NCSU Campus in Raleigh, NC. The licensee currently is not allowed to receive byproduct material on the reactor license.

The licensee has requested authority to receive and possess byproduct material in the form of reactor components and reactor experimental facilities to be used in the facility. In addition, the licensee has requested authority to receive and possess byproduct material to be irradiated in the reactor. The licensee is making this request so that the material can be received, possessed, and used under the reactor facility license. The NRC staff's primary concern during the review was that North Carolina is an agreement state. In an agreement state, byproduct material is normally licensed under a state-issued byproduct materials license. Traditionally, if the licensee can show that the material is for a definite reactor-related research and development purpose, the material can be placed under the reactor license. If the material is in the form of "...reactor components, reactor experimental facilities..." then the use is obvious and restrictive to that associated with the operation of the facility. However, if byproduct material does not have an obvious and restrictive use associated with the operation of the facility, then how it should be licensed is not as clear. In this case the licensee is proposing a time restriction associated with material that fits into the latter category. This license condition would ensure that material possessed on the reactor license is utilized, by irradiation in the reactor, within a reasonable time interval.

The issue of how to license byproduct material produced at other facilities was considered by the NRC staff in the late 1980s (August 18, 1988, memorandum from Dennis M. Crutchfield, Director, Division of Reactor Projects - III, IV, V and Special Projects to Regional Directors of

Radiation Safety and Safeguards). The question was how to license byproduct material that was to be irradiated in a licensee's reactor. The NRC staff's concern was that the reactor license would become a substitute for a state general byproduct material license by allowing the receipt and possession of byproduct material not related to a licensee's reactor operations or research. The NRC staff addressed this issue by allowing licensees to add a license condition to their reactor license authorizing receipt, possession, and use of any byproduct material as long as the byproduct material is irradiated in the reactor within 31 days of receipt.

A similar request was made by The University of Texas, Docket No. 602. In that case the NRC issued amendment No. 6 to Facility Operating License No. R-129. A copy of the amendment may be found at the NRC Public Document Room or the Electronic Reading Room (Accession No. ML061320052) on the NRC public website (<http://www.nrc.gov>).

3.0 EVALUATION

The licensee has requested the addition of license condition 2.b.(4) as follows:

- (4) Pursuant to the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to receive, possess and use in connection with operation of the facility:
 - (a) any amount of byproduct material in the form of reactor components or otherwise integral to the reactor or reactor experimental facility,
 - (b) byproduct material which is to be irradiated in the reactor within 31 days of receipt.

The licensee requested license condition 2.b.(4)(a) to permit the facility to receive, possess, and use byproduct material in the form of reactor components or reactor experimental facilities produced at other facilities that have a clear reactor related use. The licensee is also requesting license condition 2.b.(4)(b) to receive, possess, and use byproduct material produced at other facilities. The licensee is proposing a time restriction specific to this license condition to ensure that material possessed on the reactor license is utilized, by irradiation in the reactor, within 31 days of receipt.

The licensee stated that they have extensive controls in place for the safe handling of byproduct material, including an approved radiation protection program, health physics procedures, experimental protocols, and as low as reasonably achievable policies. They have also stated that no changes are required to the existing technical specifications (TSs), emergency plan, or security plan.

The NRC staff has determined that the licensee has demonstrated a need for the requested byproduct material authorization under the reactor license. The addition of a license condition for byproduct material to be irradiated in the reactor within 31 days of receipt is in accordance with the NRC staff's guidance and precedent and, therefore, is acceptable. The NRC has inspected the licensee's facility and all aspects of their operation at regular intervals. The licensee has demonstrated the safe handling of byproduct material. Because the requested materials will be under the terms of the existing license conditions (TSs, security and emergency plans, and facility procedures) and, based on experience, can be safely received,

possessed, and used by the licensee, the changes in the byproduct material license limits are acceptable. The staff finds that there is reasonable assurance that this change will not significantly impact the health and safety of the public.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that this amendment involves no significant hazards consideration, no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

The NRC staff has concluded, on the basis of the considerations discussed above, that (1) the amendment does not involve a significant hazards consideration because the amendment does not involve a significant increase in the probability or consequences of accidents previously evaluated, create the possibility of a new kind of accident or a different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed activities; and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributor: W. Schuster

Date: August 15, 2006