

July 21, 2006

EA-06-166

Dr. W. D. Reece, Director
Nuclear Science Center
Texas Engineering Experimental Station
Texas A&M University
3575 TAMU
College Station, Texas 77843-3575

SUBJECT: ISSUANCE OF ORDER MODIFYING LICENSE NO. R-83 TO AMEND
POSSESSION LIMIT FOR URANIUM-235 ASSOCIATED WITH CONVERSION
FROM HIGH- TO LOW-ENRICHED URANIUM (AMENDMENT NO. 16) -
NUCLEAR SCIENCE CENTER TRIGA RESEARCH REACTOR (TAC NO.
MD2552)

Dear Dr. Reece:

The U.S. Nuclear Regulatory Commission (NRC) is issuing the enclosed Order, as Amendment No. 16 to Amended Facility Operating License No. R-83, which allows possession of material to prepare for the conversion from high-enriched uranium (HEU) fuel to low-enriched uranium (LEU) fuel in accordance with Section 50.64 of Title 10 of the *Code of Federal Regulations*. This Order is being issued in response to your letter dated June 13, 2006. The Order changes License Condition 2.B.(2) to allow possession and use of the current fuel in connection with operation of the research reactor and to remove the authorization to receive additional HEU fuel, and adds License Condition 2.B.(8) to allow receipt and possession of the LEU fuel for conversion. The Order will become effective 20 days after the date of its publication in the *Federal Register*, provided there are no requests for a hearing.

Sincerely,

/RA by Marvin Mendonca for/
Brian E. Thomas, Chief
Research and Test Reactors Branch A
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-128

Enclosure: Order

cc w/encl: See next page

Texas A&M University

Docket No. 50-128

cc:

Mayor, City of College Station
P.O. Box Drawer 9960
College Station, TX 77840-3575

Governor's Budget and
Planning Office
P.O. Box 13561
Austin, TX 78711

Texas A&M University System
ATTN: Jim Remlinger
Nuclear Science Center
Texas Engineering Experiment Station
F. E. Box 89, M/S 3575
College Station, Texas 77843

Texas State Department of Health
Radiation Control Program Director
Bureau of Radiation Control
Dept. of Health
1100 West 49th Street
Austin, Texas 78756-3189

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

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cc w/encl: See next page

ADAMS Accession No. ML061810481

*See previous concurrence

**concurred via E-mail

OFFICE	DPR/LA	DPR/PM	OGC	OE	NSIR	PRTA/BC	DPR/(A)D	NRR/D
NAME	DBaxley*	MMendonca*	BJones*	DSolorio	SMorris**	MMendonca for BThomas:tls*	HNieh*	JDyer*
DATE	7/11/06	7/11/06	7/17/06	7/13/06	7/13/06	7/14/06	7/19/06	7/21/06

OFFICIAL RECORD COPY

DISTRIBUTION FOR ISSUANCE OF ORDER MODIFYING LICENSE NO. R-83 TO AMEND
POSSESSION LIMIT FOR URANIUM-235 ASSOCIATED WITH CONVERSION FROM HIGH-
TO LOW-ENRICHED URANIUM - NUCLEAR SCIENCE CENTER TRIGA RESEARCH
REACTOR (TAC NO. MD2552)

Dated: July 21, 2006

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RidsNrrAdra
RidsNrrDpr
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RidsOgcRp
RidsAcrsAcnwMailCenter
RidsSecyMailCenter
WSchuster
TDragoun
MMendonca
AAdams
MVoth
EHylton
CBassett
BThomas
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DHughes
KWitt
PIsaac
GHill (2)
PDoyle
WKennedy

UNITED STATES OF AMERICANUCLEAR REGULATORY COMMISSION

In the Matter of)

Texas A&M University)

(Nuclear Science Center
TRIGA Research Reactor))Docket No. 50-128
EA-06-166

ORDER MODIFYING AMENDED FACILITY OPERATING LICENSE NO. R-83

I.

The Texas A&M University (the licensee) is the holder of Amended Facility Operating License No. R-83 (the license). The license was issued on December 7, 1961, by the U.S. Atomic Energy Commission and subsequently renewed on March 30, 1983, by the U.S. Nuclear Regulatory Commission (the NRC or the Commission). The license includes authorization to operate the Nuclear Science Center TRIGA Research Reactor (the facility) at a power level up to 1,000 kilowatts thermal and to receive, possess, and use special nuclear material associated with the operation. The facility is on the campus of the Texas A&M University, in the city of College Station, Brazos County, Texas. The mailing address is Nuclear Science Center, Texas Engineering Experimental Station, Texas A&M University, 3575 TAMU, College Station, Texas 77843-3575

II.

On February 25, 1986, the Commission promulgated a rule, Section 50.64 of Title 10 of the *Code of Federal Regulations* (10 CFR), limiting the use of high-enriched uranium (HEU) fuel in domestic research and test reactors (non-power reactors). This regulation requires that if Federal Government funding for conversion-related costs is available, each licensee of a research and test reactor authorized to use HEU fuel shall replace it with low-enriched uranium

(LEU) fuel. The Commission's stated purpose for these requirements was to reduce, to the maximum extent possible, the use of HEU fuel in order to reduce the risk of theft and diversion of HEU fuel used at research and test reactors (51Fed. Reg. 6514).

The provisions of 10 CFR 50.64(c)(2)(iii) require the licensee to include in its conversion proposal, to the extent required to effect conversion, all necessary changes to the license, the facility, and licensee procedures.

III.

On June 13, 2006, the licensee submitted a letter as part of its conversion proposal, which indicated that changes to the Uranium-235 possession limit in its license were needed to support the proposed schedule for conversion to LEU fuel. The possession of the LEU fuel is required by the licensee at this time to prepare the fuel in bundles in order to meet the proposed timely conversion. The LEU fuel contains the Uranium-235 isotope at an enrichment of less than 20 percent. The NRC staff reviewed the licensee's proposal and the requirements of 10 CFR 50.64, and has determined that the public health and safety and common defense and security require the licensee to receive and possess the LEU fuel so that the LEU fuel may be prepared to convert from HEU fuel in accordance with the schedules planned by the Department of Energy to support U.S. non-proliferation policies. Issuance of this Order will, therefore, allow the conversion to proceed in accordance with the planned schedule. The NRC staff also determined that there should be a prohibition on receiving additional HEU fuel and a reduction in the associated authorized possession limit concurrent with the effectiveness of the amendment authorizing receipt and possession, but not use, of the LEU fuel. The specific conditions needed to reduce the HEU fuel possession limit, to amend the facility license to allow possession of the LEU fuel, and to be made a part of the license in accordance with this Order are:

- 2.B.(2) Pursuant to the Act and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to possess and use up to 12.0 kilograms of contained Uranium-235 at enrichment equal to or less than 70 percent in connection with operation of the reactor.
- 2.B.(8) Pursuant to the Act and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to receive and possess, in addition to the amount specified under License Condition 2.B.(2), up to 15.0 kilograms of contained Uranium-235 at enrichments equal to or less than 20 percent.

The attached safety evaluation provides additional details on the NRC staff analyses resulting in the determination to order these changes .

IV.

Accordingly, pursuant to Sections 51, 53, 57, 101, 104, 161b, 161i, and 161o of the Atomic Energy Act of 1954, as amended, and to Commission regulations in 10 CFR 2.202 and 10 CFR 50.64, IT IS HEREBY ORDERED THAT:

Amended Facility Operating License No. R-83 is modified by amending the license to include the license conditions as stated in Section III of this Order. This Order will be effective 20 days after the date of publication of this Order in the *Federal Register*.

V.

Pursuant to the Atomic Energy Act of 1954, as amended, any person adversely affected by this Order may submit an answer to this Order, and may request a hearing on this Order, within 20 days of the date of this Order. The answer may consent to this Order. Any answer or

request for a hearing shall set forth the matters of fact and law on which the licensee, or other person adversely affected, relies and the reasons why the Order should not have been issued. Any answer or request for a hearing shall be filed (1) by first class mail addressed to the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) by courier, express mail, and expedited delivery services to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Because of continuing disruptions in delivery of mail to the United States Government Offices, it is requested that answers and/or requests for hearing be transmitted to the Secretary of the Commission either by e-mail addressed to the Office of the Secretary, U.S. Nuclear Regulatory Commission, HEARINGDOCKET@NRC.GOV; or by facsimile transmission addressed to the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C., Attention: Rulemakings and Adjudications Staff at 301-415-1101 (the verification number is 301-415-1966). Copies of the request for hearing must also be sent to the Director, Office of Nuclear Reactor Regulation and to the Assistant General Counsel for Materials Litigation and Enforcement, Office of the General Counsel, with both copies addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, and the NRC requests that a copy also be transmitted either by facsimile transmission to 301-415-3725 or by e-mail to OGCMailCenter@nrc.gov. If a person other than the licensee requests a hearing, he or she shall set forth in the request for a hearing with particularity the manner in which his or her interest is adversely affected by this Order and shall address the criteria set forth in 10 CFR 2.309.

If a hearing is requested by the licensee or a person whose interest is adversely affected, the Commission shall issue an Order designating the time and place of any hearing.

If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

In accordance with 10 CFR 51.10(d) this Order is not subject to Section 102(2) of the National Environmental Policy Act, as amended. The NRC staff notes, however, that with respect to environmental impacts associated with the changes imposed by this Order, as described in the safety evaluation attached, the changes would, if imposed by other than an Order, meet the definition of a categorical exclusion in accordance with 10 CR 51.22(c)(9). Thus, pursuant to either 10 CFR 51.10(d) or 51.22(c)(9), no environmental assessment nor environmental impact statement is required.

For further information see the June 13, 2006, letter from the licensee (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061720033), and the NRC staff's safety evaluation attached to this Order (ADAMS Accession No. ML061810481), available for public inspection at the Commission's Public Document Room (PDR), located at One White Flint North, Public File Area O1 F21, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the ADAMS Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/reading-rm/adams.html>. Persons who do not have access to ADAMS or who have problems in accessing the documents in ADAMS should contact the NRC PDR reference staff by telephone at 1-800-397-4209 or 301-415-4737 or by e-mail to pdr@nrc.gov.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

J. E. Dyer, Director
Office of Nuclear Reactor Regulation

Dated this 21st day of July 2006

Attachment: Safety Evaluation

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING ORDER ON

POSSESSION LIMIT CHANGES TO ALLOW CONVERSION

FROM HIGH-ENRICHED TO LOW-ENRICHED URANIUM FUEL

AMENDED FACILITY OPERATING LICENSE NO. R-83

NUCLEAR SCIENCE CENTER TRIGA RESEARCH REACTOR

TEXAS A&M UNIVERSITY

DOCKET NO. 50-128

1.0 INTRODUCTION

By letter dated June 13, 2006, the Texas A&M University (the licensee) indicated that changes to the Nuclear Science Center (NSC) TRIGA Research Reactor possession limit was needed to allow for the timely conversion from the use of high-enriched uranium (HEU) fuel to low-enriched uranium (LEU) fuel in accordance with Section 50.64 of Title 10 of the *Code of Federal Regulations* (10 CFR). This regulation was promulgated to reduce the risk of theft and diversion of HEU fuel used in non-power reactors. The U.S. Nuclear Regulatory Commission (NRC) staff determined as discussed below that the following changes to the possession limit license conditions were acceptable. The change to the current License Condition 2.B.(2) removes the authority to receive HEU fuel and decreases the possession limit of contained Uranium-235 (U-235) with enrichments up to 70 percent from 17.0 to 12.0 kilograms (kgs) to allow the continued possession and use of material at the facility. The changes also involve the addition of License Condition 2.B.(8) to allow receipt and possession, but not use, of up to an additional 15 kgs of contained U-235 at enrichments equal to or less than 20 percent (LEU fuel).

2.0 BACKGROUND

The license currently includes a possession limit of special nuclear material to allow for operation of the facility. This limit allows for an amount of special nuclear material so that the facility can continue to conduct its licensed research reactor activities.

In its June 13, 2006, letter, the licensee indicated that an increase to the possession limit for special nuclear material is required to allow for the timely conversion to LEU fuel. The licensee indicated that it is working with the U.S. Department of Energy (DOE), DOE contractors, and the NRC to convert the NSC TRIGA Research Reactor from HEU fuel to LEU fuel in support of

non-proliferation policies. The licensee's letter stated that in order to avoid prolonged reactor shutdown and accomplish the conversion in support of non-proliferation goals, a period will exist in which the NSC TRIGA Research Reactor will need to possess a quantity of U-235 in excess of the current licensed maximum. As additional evidence, the licensee also provided a DOE letter dated April 13, 2006. In the April 13, 2006, letter, DOE indicated that the project schedule for conversion includes shipping a fresh fuel core to replace the fuel currently in the reactor. Further, DOE indicated that in order to support the timeliness of this effort as planned, the license will need an increase in the special nuclear material possession limit to accommodate the fuel inventory at the facility during the process.

3.0 EVALUATION

The licensee has not requested any changes to the Technical Specifications (TSs) nor security plan. Thus, the additional material will be received and possessed under the current terms of the reactor license. The NRC staff reviewed the license, TSs, and security plan requirements for the facility and finds that the possession of the additional LEU fuel will not require additional safety or security controls or conditions beyond those already in place. The NRC staff also finds that this increase in the fuel possession limit is within the normal possession limit for research reactors.

The increased possession limit does not allow operation with the fuel other than that already authorized by the license and TSs. This change does not authorize conversion to the new LEU fuel planned for conversion, i.e., 30 weight percent (Wt%) vice the currently authorized 9 Wt%. (The authorization for conversion will be the subject of an ongoing separate evaluation). Therefore, the radioactive fission product inventory will not be increased by the increased fuel possession limit and the routine effluent or potential accident release levels will not increase beyond those already analyzed and accepted under the current license and TSs.

Further, in accordance with the existing TSs, reactor fuel will be stored in a geometrical array where the effective multiplication is less than 0.8 for all conditions of moderation. Therefore, the potential for accidental criticality is not increased with the increased fuel possession limit.

The increase in the special nuclear material possession limit does not impact the security requirements for the facility. In accordance with 10 CFR 73.2, the increase possession would be consistent with special nuclear material of moderate strategic significance (Category II). The licensee's current security plan meets or exceeds the requirements for this level of material under 10 CFR 73.67(d).

The license changes are to allow for conversion in a manner that is timely to support the non-proliferation goals of the nation and allow continued research and development in accordance with the license and regulations. They do not change the security plan requirements which are consistent the provisions of 10 CFR 73.67(d) for special nuclear material of moderate strategic significance (Category II) in accordance with 10 CFR 73.2, because the addition of the LEU fuel is within the possession limit for that category of material.

The inspection program has found that the licensee has routinely used such material safely and securely.

The licensee submitted a proposed license condition in its June 13, 2006, letter. The NRC staff noted several changes from the proposed license condition were needed to allow for possession of the current material and allow for receipt, but not use, of the new LEU fuel. Specifically, the licensee's authority to receive additional HEU fuel is removed from License Condition 2.B.(2), and the amount of material possessed under that license condition was reduced from 17.0 to 12.0 kg. Further, License Condition 2.B.(8) is added to allow for the receipt and possession, but not use, of the LEU fuel for conversion. A telephone conversation between the project manager and the Associate Director of the NSC TRIGA Research Reactor facility on July 6, 2006, confirmed that these differences were understood and could be implemented consistent with protecting the public health and safety.

Because the requested increased possession limit may be possessed safely and securely under the terms of the existing TSs and security plan, the increase in special nuclear material possession limit as specified above is acceptable to the NRC staff. Further, the NRC staff has determined that the public health and safety and the common defense and security require the licensee to receive and possess the LEU fuel so that the LEU fuel may be configured into fuel bundles to convert from HEU fuel in accordance with the schedule planned by the DOE to support U.S. non-proliferation policies.

3.0 ENVIRONMENTAL CONSIDERATION

In accordance with 10 CFR 51.10(d), an Order is not subject to Section 102 of the National Environmental Policy Act. The NRC staff notes, however, that even if these changes were not being imposed by an Order, the changes would not require an environmental impact statement or environmental assessment. The license changes involve use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes in inspection and surveillance requirements. The NRC staff has determined that the changes involve no significant increase in the amounts or types of any effluents that may be released off site and no significant increase in individual or cumulative occupational radiation exposure. Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is required.

4.0 CONCLUSION

The NRC staff has concluded, on the basis of the considerations discussed above, that (1) the proposal by the licensee for possession of LEU fuel is consistent with and in furtherance of the requirements of 10 CFR 50.64, (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 will not be inimical to the common defense and security or the health and safety of the public. Accordingly, it is concluded that an enforcement order as described above should be issued pursuant to 10 CFR 50.64(c)(3).

Principal Contributor: M. Mendonca

Date: July 21, 2006