

January 4, 2017

Mr. Ralph Butler, Executive Director
University of Missouri-Columbia
Research Reactor Center
1513 Research Park Drive
Columbia, MO 65211

SUBJECT: UNIVERSITY OF MISSOURI – COLUMBIA REGARDING ISSUANCE OF
RENEWED FACILITY OPERATING LICENSE NO. R-103 FOR THE
UNIVERSITY OF MISSOURI – COLUMBIA RESEARCH REACTOR
(TAC NO. ME1580)

Dear Mr. Butler:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Renewed Facility Operating License No. R-103 for the University of Missouri-Columbia Research Reactor in response to the application for license renewal dated August 31, 2006, as supplemented on January 29, July 16, August 31, September 3, September 30, October 29 (two letters), and November 30, 2010; March 11, and September 8, 2011; January 6, and June 28, 2012; January 4, 2013; January 28, July 31, September 15, and October 1, 2015; and February 8, April 8, April 15, May 31, July 25, August 31, November 7, November 15 (two letters), and December 14, 2016. The renewed facility operating license is effective on date of issuance, and shall expire at midnight, 20 years from the date of issuance, unless terminated sooner.

In accordance with agency practice, the renewed license issued by the NRC has restated the license in its entirety, incorporating all changes and amendments made since the issuance of the original license as appropriate. Also enclosed with the renewed facility operating license is the safety evaluation report that documents the license renewal review. A Notice of Issuance of Renewed Facility Operating License No. R-103 has been sent to the Office of the *Federal Register* for publication. The Notice of Availability of Environmental Assessment and Finding of No Significant Impact for the University of Missouri-Columbia Research Reactor was published in the Federal Register on November 29, 2016 (81 FR 86024).

R. Butler

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If you have any questions, please contact me at 301-415-0893 or by electronic mail at Geoffrey.Wertz@nrc.gov.

Sincerely,

/RA by Michael Balazik for/

Geoffrey A. Wertz, Project Manager
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-186

Enclosures:

1. Facility Operating License No. R-103
2. Safety Evaluation Report

cc: See next page

University of Missouri-Columbia

Docket No. 50-186

cc:

Les Foyto, Associate Director
Reactor and Facilities Operations
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Columbia, MO 65211

Homeland Security Coordinator
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Jefferson City, MO 65101

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

R. Butler

- 2 -

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SE: ML16124A887; *concurrence via e-mail**

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DATE	12/13/16	12/21/16	1/4/17	1/5/17

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THE CURATORS OF THE UNIVERSITY OF MISSOURI

DOCKET NO. 50-186

RENEWED FACILITY OPERATING LICENSE

License No. R-103

1. The U.S. Nuclear Regulatory Commission ("the Commission") has found that:
 - A. The application for renewal of Facility Operating License No. R-103 filed by The Curators of the University of Missouri ("the licensee"), dated August 31, 2006, as supplemented on January 29, July 16, August 31, September 3, September 30, October 29 (two letters), and November 30, 2010; March 11, September 8, 2011; January 6, and June 28, 2012; January 4, 2013; January 28, July 31, September 15, and October 1, 2015; and February 8, April 8, April 15, May 31, July 25, August 31, November 7, November 15 (two letters), and December 14, 2016 ("the application"), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended ("the Act"), and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Chapter I;
 - B. Construction of the Missouri University Research Reactor Facility ("the facility") was completed in substantial conformity with the Construction Permit No. CPRR-68, issued on November 21, 1961, and the application, as amended; the provisions of the Act; and the rules and regulations of the Commission;
 - C. The facility will operate in conformity with the application, as supplemented, the provisions of the Act, and the rules and regulations of the Commission;
 - D. There is reasonable assurance that: (i) the activities authorized by this license can be conducted without endangering the health and safety of the public, and (ii) such activities will be conducted in compliance with the Commission's regulations;
 - E. The licensee is technically and financially qualified to engage in the activities authorized by this license in accordance with the rules and regulations of the Commission;
 - F. The applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," have been satisfied;

- G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;
 - H. The issuance of this license is in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the Commission's regulations and all applicable requirements have been satisfied; and
 - I. The receipt, possession and use of byproduct and special nuclear materials as authorized by this facility operating license will be in accordance with the Commission's regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material."
2. Accordingly, Facility Operating License No. R-103 is hereby renewed in its entirety to read as follows:
- A. This license applies to the University of Missouri – Columbia Research Reactor (herein "the reactor") owned by The Curators of the University of Missouri, (herein "the licensee"), located in the University Research Park, adjacent to the main campus of the University of Missouri – Columbia, in Columbia, Missouri, and described in the licensee's application for license renewal, dated August 31, 2006, as supplemented.
 - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses The Curators of the University of Missouri as follows:
 - 1. Pursuant to subsection 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess, use, and operate the facility as a utilization facility at the designated location in accordance with the procedures and limitations described in the application and set forth in this license.
 - 2. Pursuant to the Act and 10 CFR Part 70, the following activities are included:
 - a. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 55 kilograms of contained uranium-235 of an enrichment of 20 percent or greater in the isotope uranium-235, providing that less than 5 kilograms of this amount be unirradiated;
 - b. to receive, possess, and use, in connection with the operation of the facility, up to 5 kilograms of contained uranium-235 of an enrichment less than 20 percent in the isotope uranium-235, for use in experiments;
 - c. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 80 grams of plutonium-beryllium in the form of a neutron source;

- d. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 20 grams of plutonium-239 in the form of sheets enclosed in aluminum;
 - e. to receive, possess, and use, but not separate, in connection with the operation of the facility, up to 40 grams of plutonium enriched to 90 percent in plutonium-242 in the form of a rod sealed in a stainless steel can; and
 - f. to receive, possess, and use, but not separate, in connection with the operation of the facility, such special nuclear material as may be produced by the operation of the facility.
 - 3. Pursuant to the Act and 10 CFR Part 30, the following activities are included:
 - a. to receive, possess, and use, in connection with the operation of the facility, up to 100 curies of a sealed antimony-beryllium neutron source; and
 - b. to receive, possess, and use, but not to separate, in connection with operation of the facility, such byproduct material as may be produced by operation of the reactor, which cannot be separated except for byproduct material produced in reactor experiments.
 - 4. Pursuant to the Act and 10 CFR, Part 40, "Domestic Licensing of Source Material," the following activities are included:
 - a. to receive, possess, and use, in connection with operation of the facility, up to 20 kilograms each of natural uranium and thorium; and
 - b. to receive, possess, and use, in connection with the operation of the facility, up to 50 kilograms of depleted uranium for instruction and experimental purposes.
- C. This license shall be deemed to contain, and is subject to the conditions specified 10 CFR Parts 20, 30, 40, 50, 51, 55, 70, and 73 of the Commission's regulations; is subject to all provisions of the Act, and to the rules, regulations and orders of the Commission now or hereafter in effect, and is subject to the additional conditions specified or incorporated below:
- 1. Maximum Power Level

The licensee is authorized to operate the reactor at a steady-state power level up to a maximum of 10 megawatts (thermal) in accordance with the limitations in the Technical Specifications.

2. Technical Specifications

The Technical Specifications contained in Appendix A are hereby incorporated in their entirety in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Physical Security Plan

The licensee shall maintain and fully implement all provisions of the Commission-approved physical security plan, including changes made pursuant to the authority of 10 CFR 50.54(p). The approved physical security plan, entitled "Physical Security Plan for the University of Missouri Research Reactor," dated November 15, 2016, consists of documents withheld from public disclosure pursuant to 10 CFR 73.21.

This license is effective as of the date of issuance and shall expire at midnight, 20 years from the date of issuance.

For the Nuclear Regulatory Commission

/RA/

William M. Dean, Director
Office of Nuclear Reactor Regulation

Attachment:
Appendix A, Technical Specifications

Date of Issuance: January 4, 2017