

January 29, 2004

Dr. Anthony H. Francis, Director  
Phoenix Memorial Laboratory  
Ford Nuclear Reactor  
University of Michigan  
2301 Bonisteel Boulevard  
Ann Arbor, MI 48109-2100

SUBJECT: ISSUANCE OF POSSESSION ONLY LICENSE AMENDMENT NO. 47 FOR  
UNIVERSITY OF MICHIGAN FORD NUCLEAR REACTOR (TAC NO. MC1369)

Dear Dr. Francis:

In response to your submittal of June 27, 2003 and November 18, 2003, the Commission has issued enclosed Amendment No. 47 to Facility Operating License No. R-28 for the University of Michigan, Ford Nuclear Reactor.

The amendment has four parts: remove the authority from the license to operate the reactor; eliminate the possession of special nuclear material from the license; eliminate the Physical Security Plan; and maintain the licensee's authority to make changes and conduct tests and experiments.

A copy of the related safety evaluation supporting Amendment No. 47 is also enclosed.

Sincerely,

*/RA/*

Patrick J. Isaac, Project Manager  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No. 50-2

Enclosures: 1. Amendment No. 47  
2. Safety Evaluation

cc w/enclosures: Please see next page

University of Michigan

Docket No. 50-02

cc:

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THE UNIVERSITY OF MICHIGAN

DOCKET NO. 50-2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47  
License No. R-28

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for an amendment to Facility Operating License No. R-28 filed by the University of Michigan, Ford Nuclear Reactor (FNR), (the licensee) on June 27, 2003 and November 18, 2003, 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 be maintained 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 notice for this amendment is not required by 10 CFR 2.106.

2. Accordingly, Facility Operating License No. R-28 is hereby amended in its entirety to read as follows:
  - A. This license applies to the Ford Nuclear Reactor owned by the University of Michigan. The facility is located in Ann Arbor, Michigan, and is described in the application dated November 30, 1984, as supplemented.
  - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses the University of Michigan:
    - (1) Pursuant to Section 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess and use the facility at the designated location in Ann Arbor, Michigan, in accordance with the procedures and limitations set forth in this license.
    - (2) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, transfer, dispose of, but not to separate any byproduct material or special nuclear material produced by the past operation of the facility without restriction to chemical or physical form.
    - (3) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, transfer or dispose of any byproduct material received before July 3, 2003, without restriction to chemical or physical form.
  - C. This license shall be deemed to contain and is subject to the conditions specified in Parts 20, 30, 50, 51, 55, 70 and 73 of 10 CFR Chapter I, to all applicable provisions of the Act, and to the rules, regulations and orders of the commission now or hereafter in effect and to the additional conditions specified below:
    - (1) Maximum Power Level

The licensee shall not operate the reactor nor place fuel elements in the reactor grid.
    - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 47, are hereby incorporated in the license. The licensee shall maintain the facility in accordance with the Technical Specifications.
    - (3) Authority to Make Changes and Conduct Test and Experiments

The license shall be deemed to contain and is subject to the conditions specified in Section 50.59 of Part 50. In addition, the licensee shall make no changes to the facility and procedures, or conduct tests or experiments that meet any of the following criteria:

- a. Foreclose the release of the site for possible unrestricted use, or
  - b. Result in significant environmental impacts not previously reviewed.
- D. This license is effective as of the date of issuance and shall expire on July 29, 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Date of Issuance: January 29, 2004

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 47 TO

FACILITY OPERATING LICENSE NO. R-28

UNIVERSITY OF MICHIGAN

FORD NUCLEAR REACTOR

DOCKET NO. 50-2

1.0 INTRODUCTION

By letter dated June 27, 2003, as supplemented on November 18, 2003, University of Michigan (the licensee) submitted a request for amendment of Facility Operating License No. R-28 for the Ford Nuclear Reactor. The requested changes would remove authorization from the license to operate the reactor, eliminate the possession of special nuclear material from the license, eliminate the Physical Security Plan, and maintain the licensee's authority to make changes and conduct tests and experiments.

2.0 EVALUATION

The Ford Nuclear Reactor permanently ceased critical operations on July 3, 2003, and all fuel was permanently removed from the reactor grid on July 8, 2003. All reactor fuel elements have since been returned to the U.S. Department of Energy (DOE). A Decommissioning Plan is currently being prepared for submission. This Decommissioning Plan will NOT propose a delay in the completion of decommissioning through the use of a period of storage and surveillance. Upon approval of this Decommissioning Plan by the Commission, the licensee intends to aggressively pursue the completion of decommissioning activities while experienced personnel are still available to facilitate its implementation.

With Amendment 47, the licensee has proposed to: permanently remove the authority to operate the reactor; eliminate the possession of special nuclear material from the license; eliminate the Physical Security Plan; and maintain the licensee's authority to make changes and conduct tests and experiments.

**Remove the authority to operate the reactor**

To reflect this change in the status of the facility, the licensee requested that license condition B. (1) be changed to allow for the possession and use of the facility and not to operate. The use condition must be maintained to support continuing research and educational activities still

being conducted within the facility (gamma spectroscopy, neutron attenuation measurements with sources on other licenses, etc.). License condition B. (1) currently reads:

- B. (1) Pursuant to Section 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess, use and operate the facility at the designated location in Ann Arbor, Michigan, in accordance with the procedures and limitations set forth in this license.

It is proposed by the licensee that license condition B. (1) be amended to read:

- B. (1) Pursuant to Section 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess and use the facility at the designated location in Ann Arbor, Michigan, in accordance with the procedures and limitations set forth in this license.

The licensee has requested amending license condition C. (1), Maximum Power Level, to reflect that the facility is not authorized for the placement or retention of fuel into the reactor grid. License condition C. (1) currently reads:

- C. (1) Maximum Power Level

The licensee is authorized to operate the facility at a steady-state power level of 2.0 megawatts (thermal). The maximum power level shall not be in excess of 2.2 megawatts (thermal).

The licensee proposed to amend license condition C. (1) to read:

- C. (1) Maximum Power Level

The licensee shall not operate the reactor nor place fuel elements in the reactor grid.

The licensee has requested to amend license condition B. (4) to cover byproduct material produced by past operation of the facility, and license condition B. (5) to cover residual special nuclear material present at the facility prior to permanent cessation of reactor operations. License conditions B. (4) and B. (5) currently read:

- B. (4) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," and Part 70 "Domestic Licensing of Special Nuclear Material," to possess, but not to separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- B. (5) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to receive for irradiation in the reactor in the amounts as required any byproduct material without restriction to chemical or physical form having a definite research and development purpose .

Since the licensee also requested to delete current license conditions B. (2) and B. (3) (see Section: Eliminate Possession of Special Nuclear Material), the proposed license condition B.



(4) and B. (5) are being renumbered as B. (2) and B. (3) respectively. New license conditions B. (2) and B. (3) will read:

B. (2) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, transfer, dispose of, but not to separate any byproduct material or special nuclear material produced by the past operation of the facility without restriction to chemical or physical form.

B. (3) Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, transfer or dispose of any byproduct material received before July 3, 2003, without restriction to chemical or physical form.

With the certification that all fuel has been permanently removed from the reactor grid and shipped to the U.S. Department of Energy, the staff finds these changes to license conditions acceptable because they remove reference to reactor operation and are consistent with the no possession of fuel requested by the licensee.

### **Eliminate Possession of Special Nuclear Material**

The licensee has requested the elimination of license conditions B. (2) and B. (3) for the possession and use of uranium at enrichments equal to or less than 20 percent and possession of uranium at enrichments greater than 20 percent. All reactor fuel elements as special nuclear material licensed under license R-28 have been returned to the U.S. Department of Energy. License conditions B. (2) and B. (3) currently read:

B. (2) Pursuant to the Act and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to receive, possess and use up to a maximum of 18 kilograms of contained uranium 235 at enrichments equal to or less than 20 percent in connection with operation of the reactor

B. (3) Pursuant to the Act and 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," to possess, but not to use, a maximum of 8 kg of contained uranium at greater than 20 percent enrichment until the existing inventory of high enriched uranium is removed from the facility.

With the certification that all special nuclear material has been returned to the U.S. Department of Energy, the staff finds these changes to license conditions acceptable. Current license conditions B. (2) and B. (3) are deleted from Facility Operating License No. R-28.

### **Eliminate Physical Security Plan**

The licensee has requested the elimination of license conditions C. (3) which requires that the facility "implement and maintain in effect all provisions of the physical security plan approved by the Commission." The physical security plan addresses the security requirements for the reactor fuel classified as special nuclear material allowed under the license. Once all the reactor fuel covered by the license for the Ford Nuclear Reactor is removed and the license has been amended for no possession of fuel, the physical security plan is no longer necessary.

New license condition B. (2) contains reference to “special nuclear materials” which may have been produced, as a contaminant or through activation of impurities, by the past operation of the facility. These quantities are generally small, not exceeding 350 grams of uranium-235, uranium-233, plutonium, or a combination thereof, and are thus exempt from the security requirements of Part 73, as per Section 73.6(c). The regulations in Section 73.67(c)(1) of Part 73 require facilities to maintain a physical security plan when they possess special nuclear materials of moderate strategic significance or 10 kg or more of special nuclear material of low strategic significance. All other special nuclear materials in the facility, fission chambers, foils, etc., are covered by Special Nuclear Materials License SNM-179, Docket No. 070-00192/070-01734, held by the University’s Radiation Safety Services and issued by NRC Region III.

All unirradiated and irradiated reactor fuel elements have been returned to the U.S. Department of Energy. Current license conditions C. (3), which the licensee has proposed to delete, reads:

C. (3) Physical Security Plan

The licensee shall fully implement and maintain in effect all provisions of the physical security plan approved by the Commission and all amendments and changes pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p), respectively. The approved plan, which is exempt from public disclosure pursuant to the provisions of 10 CFR 2.790(d)(1), is entitled “Ford Nuclear Reactor Security Plan,” Revision 1, submitted by letter dated May 7, 1991, and supplemented February 17, 1992.

The staff finds this change to license conditions acceptable. Current license condition C. (3) is deleted from Facility License No. R-28.

It is recognized that the regulations in Sub Part I, Storage and Control of Licensed Material of Part 20 are applicable to the remaining byproduct and special nuclear materials possessed by the licensee.

**Authority to Make Changes and Conduct Tests and Experiments**

The existing requirements which authorize licensees to make changes to their facilities and procedures, or to conduct tests or experiments, without prior Commission approval are contained in 10 CFR 50.59. However, Section 50.59(b) of Part 50 states that Section 50.59 “applies to each holder of a license authorizing operation of a production or utilization facility, including the holder of a license authorizing operation of a nuclear power reactor that has submitted the certification of permanent cessation of operations required under Section 50.82(a)(1) or a reactor licensee whose license has been amended to allow possession of nuclear fuel but not operation of the facility.”

As the applicability of Section 50.59 of Part 50 appears to not apply, the licensee is requesting a new license condition C. (3) which continues the authority to make changes to the facility and procedures, or to conduct tests or experiments without prior Commission approval as contained in 10 CFR 50.59.

In requesting the continued ability to make changes to the facility and procedures, and to conduct tests and experiments, one precedent is relevant:

General Atomic Docket No. 50-163 Amendment to Facility License, Amendment No. 43, License No, R-76 dated March 22, 1995

The Commission maintained General Atomic's authority to make changes to their facilities and procedures, or to conduct tests or experiments, without prior Commission approval. The terminology used in the General Atomic's amendment is consistent with the version of 10 CFR 50.59 superceded by the Commission through the issuance of the final rule RIN 3150-AF94, Changes Tests and Experiments dated 20 September 2002.

The proposed wording for new license condition C. (3) to Facility License No. R-28 is:

C. (3) Authority to Make Changes and Conduct Test and Experiments

The license shall be deemed to contain and is subject to the conditions specified in Section 50.59 of Part 50. In addition, the licensee shall make no changes to the facility and procedures, or conduct tests or experiments that meet any of the following criteria:

- a. Foreclose the release of the site for possible unrestricted use, or
- b. Result in significant environmental impacts not previously reviewed.

The staff finds these changes acceptable because they are consistent with the substance of 10 CFR 50.59.

### 3.0 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 or changes in inspection and surveillance requirements. The staff has determined that this amendment involves 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 with the issuance of this amendment.

### 4.0 CONCLUSION

The staff has concluded, on the basis of the considerations discussed above, that (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously evaluated, or create the possibility of a new or different kind of accident from any accident previously evaluated, and does not involve a significant reduction in a margin of safety, the amendment does not involve a significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed changes; and (3) such changes are 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: Patrick J. Isaac

Date: January 29, 2004