



# The University of Michigan

MICHIGAN MEMORIAL – PHOENIX PROJECT  
PHOENIX MEMORIAL LABORATORY FORD NUCLEAR REACTOR  
ANN ARBOR, MICHIGAN 48109-2100

18 November 2003

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Docket 50-2, License R-28

**Subject: Ford Nuclear Reactor License and Technical Specification Amendment 47 (REVISED), *First License Amendment following Permanent Cessation of Operation***

Dear Mr. Isaac:

The University of Michigan, Ford Nuclear Reactor is submitting this revision to proposed Amendment 47, *Elimination of Possession of Special Nuclear Material and Physical Security Plan* originally submitted on 27 June 2003. This revision to proposed Amendment 47 is based upon conversations with Patrick J. Isaac, Project Manager and Patrick Madden, Section Chief. The Decommissioning Plan required to precede the License Termination Request required by 10 CFR 50.82(b)(1) is currently being prepared for submission in the first quarter of calendar year 2004. 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 University intends to aggressively pursue the completion of decommissioning activities while experienced personnel are still available to facilitate its implementation.

This license amendment has four parts: 1) eliminate operation of the facility; 2) eliminate the possession of special nuclear material from the license; 3) eliminate the Physical Security Plan and 4) explicitly maintain the licensee's authority to make changes and conduct tests and experiments.

## **Permanent Cessation of Operations**

The Ford Nuclear Reactor permanently ceased critical operations at 15:34, 3 Jul 2003 [10 CFR 50.82.a(1)(i)] and all fuel was permanently removed from the reactor grid on 8 Jul 2003 [10 CFR 50.82.a(1)(ii)]. To reflect this change in the status of the facility it is requested that:

- License condition B(1) be changed to allow for the possession and use of the facility. 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.).

### **Original Condition:**

B(1) Pursuant to Section 104 c 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.

### **Proposed Condition:**

B(1) Pursuant to Section 104 c 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.

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- License condition B(4) and B(5) be revised to cover that byproduct material and residual special nuclear material at the facility when reactor operations were permanently ceased.

Original Condition:

- B(4) *Pursuant of the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct 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 .*

Proposed Condition:

- B(4) 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(5) 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 03 July 2003 without restriction to chemical or physical form.
- License condition C(1), *Steady State and Maximum Power Levels* be changed to reflect that the facility is not authorized for the placement or retention of fuel into the reactor grid [10 CFR 50.82(2)].

Original Condition:

- C(1) ***Steady State and Maximum Power Levels:** 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).*

Proposed Condition:

- C(1) **Steady State and Maximum Power Levels:** The licensee shall not operate the reactor nor place fuel elements in the reactor grid.

### Removal of Special Nuclear Material

The University is requesting 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% and possession of uranium at enrichments greater than 20%. This request is in advance of the removal of all irradiated reactor fuel elements covered by the license for the Ford Nuclear Reactor under the schedule provided to and maintained current for the Commission as required by 10 CFR 73.72. All unirradiated reactor fuel elements were returned to the U.S. Department of Energy on 20 August 2003. It is understood that this license amendment, if approved, would be effective only after all the special nuclear material licensed under license R-28 has been returned to the U.S. Department of Energy.

- B(2) *Pursuant to the Act and 10 CFR 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% in connection with operation of the reactor*
- B(3) *Pursuant to the Act and 10 CFR 70, "Domestic Licensing of Special Nuclear Material," to receive, possess but not to use, a maximum of 8 kilograms of contained uranium at greater than 20% enrichment until the existing inventory of high enriched uranium is removed from the facility.*

### Removal of Physical Security Plan

The University is also requesting 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." This request is in advance of the removal of all irradiated reactor fuel elements covered by the license for the Ford Nuclear Reactor under the schedule provided to and maintained current for the Commission as required by 10 CFR 73.72. All unirradiated reactor fuel elements were returned to the U.S. Department of Energy on 20 August 2003. It is understood that this license amendment, if approved, would be effective only after all the reactor fuel covered under license R-28 has been

returned to the U.S. Department of Energy.

The license condition B(4) still contains reference to "special nuclear materials as may be produced by the past operation of the facility". This material is intended to cover that special nuclear material which may have been produced as a contaminant or through activation of impurities. These quantities are generally small, in a quantity 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).

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 3.

- 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 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. The referenced physical security plan addresses the physical security requirements for the special nuclear materials as fuel allowed under the license and is no longer necessary once all special nuclear material as fuel covered by the license for the Ford Nuclear Reactor is removed and the license has been amended for no possession of fuel as requested above.

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.

### **Continuation of Licensee's Authority to Make Changes and Conduct Tests and Experiments**

The existing requirements governing the authority of production and utilization facility 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. Comparable provisions exist in Sec. 72.48 for licensees of facilities for the independent storage of spent nuclear fuel and high-level radioactive waste. 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 which continues our 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.

Proposed Condition:

- C(4) **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.

In requesting the continued ability to make changes to the facility and procedures, and to conduct tests and experiments, two precedents are relevant.

1. For non-fuel possessing and non-operating production and utilization facilities the Commission has maintained the licensee's authority to make changes to their facilities and procedures, or to conduct tests or experiments, without prior Commission approval:

Detroit Edison Company Docket No. 50-16 Enrico Fermi Atomic Power Plant Unit 1 Amendment to Facility Operating License, Amendment No. 20, License DPR-9 dtd 15 May 2003.

C. *This license shall be deemed to contain and is subject to the conditions specified in Part 20, Section 50.59 of part 50,...*

2. For non-operating non-power reactors the Commission has maintained the licensee's authority to make changes to their facilities and procedures, or to conduct tests or experiments, without prior Commission approval:

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

2.C.1(a) *The licensee may (i) make changes in the facility or procedures as described in the Hazards Summary Report and(ii) conduct tests or experiments not described in the Hazards Summary Report without prior Commission approval, unless the proposed changes, test, or experiments involve and change in the technical specifications incorporated in the license or an unreviewed safety question.*

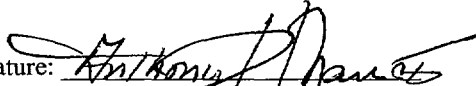
2.C.1.(b) *A proposed change, test or experiment shall be deemed to involve an unreviewed safety question if (i) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the Hazards Summary Report may be increased, or (ii) a possibility for an accident or malfunction of a different type than evaluated previously in the Hazardous Summary Report may be created, or (iii) in the margin of safety as defined for any technical specification is reduced.*

Note: The terminology used in the General Atomics 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 University requests timely approval of this license amendment *before* completion of the shipment of the remaining irradiated reactor fuel elements to the U.S. Department of Energy. This will allow the University to eliminate the significant staffing costs required by the implementation of the security requirements in the Physical Security Plan when the last irradiated reactor fuel element has been secured and received by the U.S. Department of Energy. Written certification that all irradiated reactor fuel has been removed from the facility will be provided to the Commission immediately so that the University can implement this requested amendment as soon as possible.

If there are any questions regarding this information, please feel free to contact Christopher W. Becker at (734) 764-6224.

I declare under penalty of perjury that the foregoing is true and correct.

Signature:   
Anthony H. Francis, Ph.D.  
Director Michigan Memorial Phoenix Project

Executed on: 18 Nov. 6er 2003

Enclosure: Operating License R-28, Amendment 47, Proposed (Revised)

Cc: Patrick Isaac

File: Correspondence 03-031  
License Amendment - Amendment 47  
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# OPERATING LICENSE AND TECHNICAL SPECIFICATIONS

Ford Nuclear Reactor  
Docket 50-2, License R-28  
Amendment 47: Proposed

License Renewal Issue With Amendments 1-32: 110384				
Amendment:	33: 080489	34: 070191	35:040792	36:050192 37:062592
	38: 100792	39: 051493	40: 080193	41: 111594 42: 021795
	43: 080995	44: 041698	45: 091798	46: Submitted 47: Proposed

## FORD NUCLEAR REACTOR

The University of Michigan  
Docket 50-2

## OPERATING LICENSE R-28

- 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 104 c 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 for in this license.
  - (2) Deleted
  - (3) Deleted
  - (4) 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.
  - (5) 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 03 July 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:

OPERATING LICENSE AND TECHNICAL SPECIFICATIONS

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(1) **Steady State and Maximum Power Levels**

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

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(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 operate the facility in accordance with the technical specifications.

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(3) Deleted

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(4) **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 twenty years from its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Director  
Division of Licensing

Date of Issuance: July 29, 1985

Enclosure: Appendix A, Technical Specifications