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February 1, 1984

NOTE TO: Chairman Palladino

FROM: W. J. Dircks  
Executive Director for Operations

SUBJECT: DRAFT GUIDANCE FOR FEBRUARY 6, 1984 COMMISSION MEETING

Enclosed is draft guidance dealing with the use of HEU at research reactors.

As you requested in your memo of January 18, 1984, staff has prepared draft guidance which would serve as a basis for discussion at the Commission meeting on February 6, 1984.

(Signed) T. A. Rehm

*for*  
William J. Dircks  
Executive Director for Operations

Enclosure:  
As stated

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

**DRAFT**

MEMORANDUM FOR: William J. Dircks  
Executive Director for Operations

FROM: Samuel J. Chilk  
Office of the Secretary

SUBJECT: DEVELOPMENT OF PROPOSED RULE ON HEU AT DOMESTIC  
RESEARCH REACTORS AND INTERIM SECURITY MEASURES

By memorandum dated June 21, 1983, I reported that the Commission agreed that a proposed rule be developed to implement the Commission's policy for reduction of the use of high enriched uranium (HEU) at domestic research reactors. The Chairman also requested that the staff brief the Commission on the matter before extensive effort was expended in developing the proposed rule. The briefing was held on December 19, 1983, and January 27, 1984, and you are requested to proceed expeditiously with development of the proposed rule.

A. Proposed Rule on HEU at Domestic Research Reactors

In addition to the provisions set out in the memorandum of June 21, 1983, the proposed rule should, to the extent feasible, minimize the licensing burden that could result. Consideration should be given to providing in the rule for automatic extension of existing licenses to cover LEU if prescribed conditions are met. Those conditions should assure that present safety margins are not significantly reduced. To this end the staff should act promptly to initiate a generic safety evaluation report setting forth safety envelopes for the plants under consideration, and the rule package should ask for comment on dealing with the limited changes in safety margins in this manner.

The Commission wishes to review two options:

- a. A rule requiring the conversion to LEU fuel of all licensed research and training reactors other than those exempted because of a unique purpose. Under this option, reactors that regularly replace burned up fuel would be required to replace such fuel with low enrichment uranium fuel as the HEU fuel is used up, and as the replacement fuel is available. The schedule for such replacements shall be developed with the Director of NRR who will coordinate such actions with DOE. If a suitable replacement fuel is not expected to be available within the overall schedule for the DOE RERTR program, the licensee shall use a replacement fuel at an enrichment that is as low as technically achievable, based on the technology developed by DOE, until such time as improved technology, permitting

operation with fuel at enrichment of 20 percent or less, is available. For reactors that do not expect to require the acquisition of new fuel during the term of their license, a schedule shall be developed with the Director of NRR to provide for as prompt conversion to LEU as is reasonable. The schedules for conversion shall take into account such factors as: scheduling of shipping casks, replacement fuel fabrication, financial support, and reactor usage. It is expected that this schedule will be coordinated with DOE.

- b. A rule similar to the option developed above, but restricted to those reactors that expect to acquire new fuel during the term of their license should also be developed.

Further, the proposed rule should establish a schedule for conversion of the higher-powered reactors.

On the basis of information presented at the briefing on December 19, 1983, it is anticipated that the National Bureau of Standards reactor and perhaps the Union Carbide reactor should be considered as serving "unique purposes" and be permitted to continue use of HEU.

For the purposes of this rule, "unique purpose" should account for such characteristics as neutron flux levels and energy spectrum specifically designed to facilitate research or irradiations not readily performed elsewhere in the U.S. The Director of NRR should determine whether the reactor has a "unique purpose."

#### B. Interim Security Measures at Domestic Research Reactors

Staff should also investigate physical protection requirements applicable during the interim preceding the completion of conversion to LEU. Since nearly all nonpower reactors possessing high enriched fuel currently implement the Category II physical protection requirements of 10 CFR 73.67 (a), these should be addressed before the proposed Category I nonpower amendments are made final. Staff should assess the impact and benefit of alternative measures to be added to the Category II requirements to increase the level of protection at these facilities. The alternatives should include the following:

1. Reduce Holdings of Fresh HEU Fuel at Nonpower Reactors
2. Tamper-Proof Detection Systems and Provide Line-Supervision
3. Assure Presence of Two-Persons During Access to Material
4. Improve Communications Capability
5. Provide Access Barriers over the Reactor Core

Staff shall also investigate whether Interim Category I requirements should be amended:

1. To require submittal for NRC review and approval of the specific measures that the licensee would apply to meet the requirements of 10 CFR 73.60; and
2. To require licensees which apply the 100 rem/hour at 3 feet exemption, to meet only Category II requirements, to demonstrate how they determine that radiation levels are above the level stipulated in the exemption; and
3. To require licensees to notify the NRC at least 48 hours before they expect a change in requirement category.

Upon completion of the above efforts, staff should propose a program to the Commission for the implementation of any improvements deemed necessary. Work on the final rule for theft at Category I nonpower reactors (the permanent rule replacement to 10 CFR 73.60) shall be deferred and a schedule for completion of that effort should be included when staff presents its proposals for Category II changes.

Samuel J. Chilk  
Office of the Secretary