

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 50**

**Limiting the Use of Highly Enriched Uranium in Domestically Licensed Research and Test Reactors**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Final Rule.

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**SUMMARY:** The Commission is amending its regulations to limit the use of highly enriched uranium (HEU) fuel in domestically licensed research and test reactors (non-power reactors). The amendments generally would require that newly licensed non-power reactors use low enriched uranium (LEU) fuel and, contingent on Federal Government funding for conversion-related costs, that licensees of existing non-power reactors replace HEU fuel with LEU fuel acceptable to the Commission. The amendments are intended to promote the common defense and security by reducing the risk of theft or diversion of HEU fuel used in non-power reactors and the consequences to public health, safety and the environment from such theft or diversion. The reduction in use of HEU should encourage similar action by foreign operators of non-power reactors and, thereby, reduce the amount of HEU fuel in international use.

**EFFECTIVE DATE:** March 27, 1986.

**FOR FURTHER INFORMATION CONTACT:**

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**SUPPLEMENTARY INFORMATION:****Contents**

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**I. Background**

On July 8, 1984 (49 FR 27769), the Commission published a proposed rule which would implement Commission policy (expressed in 47 FR 37007, dated August 24, 1982) to reduce, to the maximum extent possible, the use of highly enriched uranium (HEU) in domestic and foreign research and test reactors (non-power reactors). The proposed rule was intended to implement this policy by generally requiring newly licensed non-power reactors to use low enriched uranium (LEU) fuel and licensees of existing non-power reactors to replace HEU fuel with LEU fuel when available. Use of LEU fuel rather than HEU fuel reduces the possibility that fuel from non-power reactors would be diverted or stolen for the ultimate purpose of making "Weapons-usable" material.

In the supplementary information accompanying the publication of the proposed rule, the Commission acknowledged its concerns about the costs of conversion to its licensees, including costs attendant to the licensing process. The commission, therefore, invited comments on (1) the extent that economics of conversions should influence its actions and (2) the approach of using "generic envelopes" of safety limits (explained below) and limiting conditions of operation to facilitate conversion safety reviews. Both of these issues were addressed in many comment letters, and the final rule includes provisions which the Commission believes respond in a reasonable and prudent manner to the legitimate concerns about these subjects.

**II. Responses to Public Comments on the Proposed Rule**

Over 150 comment letters were received from members of Congress, public interest groups, members of the research and test reactor community, special interest groups, the Departments of Energy (DOE) and State, the Arms Control and Disarmament Agency, and individual members of the public. The extensive comments on this proposal were separated into nine categories. (1) International Significance of NRC-Mandated Conversion; (2)

Value/Impacts of Proposed Conversion; (3) Technical Feasibility and Safety Issues; (4) Licensing Issues Attendant to Conversion; (5) Funding for Proposed Conversions; (6) Risk of Theft or Diversion of HEU Fuel; (7) Evaluation of the Threat of Theft or Diversion of HEU--- Adequacy of Security; (8) Implementation Options and Alternatives; and (9) Miscellaneous Comments.

Three categories of comments were most relevant to the underlying basis for the changes incorporated into the final rule. These were Category 4--Licensing Issues Attendance to Conversion; Category 5--Funding for Proposed Conversions; and Category--8 Implementation Options and Alternatives. Two other categories were considered to be most relevant to the decision to promulgate final rule. These were Category 1--International Significance of NRC-Mandated Conversions and Category 6--Risk of Theft or Diversion of HEU Fuel. The Commission's positions on the topics addressed in these five categories of comments are summarized below. Copies of all public comments and the complete Commission staff responses are available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street NW, Washington, DC 20555. Single copies are available without charge from the contact person.

### **Funding for Proposed Conversions**

In publishing the proposed rule for public comments, the Commission indicated in the Supplementary information section that it shares the licensees' expressed views that conversion costs should largely or entirely be financed by the Federal Government. Currently, the Federal Government, through the DOE, is providing funding for the Reduced Enrichment for Research and Test Reactor (RERTR) and other fuel research programs. The objective of these programs is to develop and demonstrate non-power reactor fuels which can be operated safely and will allow substitution of LEU for HEU fuel in such reactors. These programs have been successful to date, and their continued success is expected to result in technological developments which could lead to a significant reduction of HEU inventories both in the United States and abroad.

It was recognized that additional operational and support costs associated with physical replacements of HEU fuel with LEU fuel would be incurred in the domestic conversion of licensed facilities. A number of commenters stated that the NRC statement on costs did not constitute a firm commitment for funding expensive fuel changes and did not specify what costs would or

would not be covered. Cost of transportation (both of new and old fuel), costs caused by the difference in fuel cycles for LEU and HEU fuels, and costs associated with insurance, disposal, licensing support and potential litigation were specifically identified by commenters. It was also pointed out that the proposed rule did not establish a vital link between Federal funding and implementation, that is, it did not make clear whether or not implementation could be delayed if Federal funding did not materialize. One comment letter discussed the apparently conflicting views of NRC and DOE on conversion funding, especially for "lifetime cores," and questioned Congressional willingness to provide funding. Resolution of the funding question was considered necessary before issuance of a final rule.

Many commenters supporting the proposed rule implied that economics should not be used as a reason to avoid the changeover. Comments from two members of Congress indicted their belief that Congress would continue to provide funding for development of reduced enrichment fuels and would defray the cost of their use in *university* research reactors. Others also stated their belief that funding for conversion would be provided by Congress.

After reviewing these comments, the Commission is of the view that conversion costs of *all* domestic non-power reactors directed to convert should be financed fully by the Federal Government. The domestic conversion actions it has proposed are based on the determination that the residual risks of theft or diversion of HEU fuel from non-power reactors could be further reduced in a cost/effective manner and that these actions are consistent with the U.S. policy of setting an example to encourage conversion by foreign users of HEU in non-power reactors. Full Federal financing would also permit the Commission to meet the dictates of section 104c. of the Atomic Energy Act of 1954, as amended. Such financing would allow the Commission to impose only the minimum amount of regulation on non-power reactor licensees to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the public and will permit the continued conduct of widespread and diverse research and development activities by these licensees.

As noted in the background material accompanying publication of the proposed rule, DOE historically has provided significant support to research and test reactor programs. In fact, fuel for university reactors is currently supplied and paid for by DOE. (i.e. U.S. taxpayers) and "loaned" to the universities. It is anticipated that the funding necessary for conversion

activities for both university and other licensees could be provided through DOE or another Federal agency. The Commission has requested that Congress appropriate the necessary funding to cover licensees' conversion-related costs.

To reflect its determinations and views with respect to the funding issue, the Commission has added the following features to the final rule. First, in the definitions in §50.2, the Commission sets forth its views on elements to be considered in determining the Federal Government's obligations to provide funding for conversion-related activities. That funding could include, but is not necessarily limited or extend to (1) costs attendant to the procurement of LEU fuel; (2) costs attendant to "lost HEU fuel value" (i.e., residual value of HEU fuel being used by commercial licensees); (3) licensee cost attendant to operations necessary to replace HEU fuel with LEU fuel; (4) reasonable lost revenue costs attendant to (a) facility shutdowns necessary to accomplish the conversion process, and (b) the difference in fuel cycle costs, such as more frequent refueling resulting from the use of LEU fuel rather than HEU fuel; (5) costs attendant to both transportation of HEU fuel from and LEU fuel to the licensed facility undergoing conversion; (6) reasonable costs attendant to preparing analyses and presenting documentation required by the final rule or necessary to obtain NRC approval for the conversion process; and (7) reasonable costs associated with safeguarding HEU fuel being replaced in the process of conversion until it has been transferred to an appropriate facility. Final determination of conversion costs under the provisions of this rule and certification thereof to the Commission shall rest with the Department of Energy or other agency responsible for disbursing conversion funds, in consultation with the licensee.

Second, the paragraph on implementation, §50.64 (c), has been modified to require licensees to submit proposals for conversion which would include a certification from DOE or other appropriate Federal agency that Federal Government funding for conversion is available. Only if the certification is obtained would a licensee be required to include a schedule for conversion in the required proposal. If Federal Government funding for conversion cannot be certified, the proposal's contents may be limited to a statement of this fact; however, the licensee would be required to resubmit a proposal for conversion at 12-month intervals thereafter, until certification is obtained. This provision applies to all non-power reactor licensees.

Finally, under the provisions of §170.11 (b)(1), the Commission hereby grants to non-power reactor licensees a one-time exemption from application fees, license fees, amendment fees, renewal fees, approval fees and inspection fees associated solely with the conversion processes required by §50.64. Aside from inspection fees, the exemption for the other fees would apply to four commercial licensees affected by §50.64 (the other facilities are already exempt under §170.11(a) (4), (5), and (9)). The exemption of inspection fees would apply to 26 licensees, and is expected to be limited to any single non-routine safety inspection performed by NRC following a facility's conversion to assure that a licensee is complying with its stated or approved conversion plans and operations.

Through these provisions, the Commission believes that the costs of conversion to its licensees can be virtually eliminated.

### **Implementation Options and Alternatives**

A large fraction of the comment letters focused on the implementation features of the proposed rule. Two views held by commenters supporting the proposed rule were that a specific deadline should be imposed on conversion actions and that the conversion exemptions, under the proposed rule's unique purpose provisions, should be eliminated or tightened. In counterpoint, several commenters stated that, since it is at present uncertain what fuel would be acceptable to the Commission, the issues of funding and for license amendments should be resolved before any final rule is issued.

As to the deadline issue, the Commission has determined that establishing a specific deadline for conversion actions is not generally justified. This is in keeping with the Commission's view that funding for conversions should be available, that HEU to LEU fuel conversion addresses the potential reduction of the residual risk posed by the use of HEU fuel at licensed non-power reactors and thus does not require a specific deadline, and that domestic conversions are intended to be put on solid footing by setting a strong, resolute and sensible example, consistent with U.S. national policy, to encourage foreign operators of non-power reactors to convert to the use of LEU fuel. The Commission, however, does want to initiate the overall conversion process at the earliest possible date, and therefore, has provided in §50.64 for 12 months for the initial submission by affected licensees of their conversion proposals. To further assist licensees and the DOE, a definition of fuel acceptable to the Commission has been

added to §50.2. The Commission believes that, for several non-power reactors, fuels can be made available which would be capable of meeting this definition.

Turning to the issue of conversion exemptions which could be granted under the unique purpose provisions of the proposed rule, the Commission believes that these exemptions are needed under section 104c. of the Atomic Energy Act to permit the continued conduct of widespread and diverse research and development; however, the definition of unique purpose in §50.2 has been expanded to define more precisely the nature and purpose of the experiment, program, or commercial activity necessitating the use of HEU fuel.

The funding issue has been addressed already and the amendment issue is discussed later with respect to §50.64. The remaining issue in this subgroup of implementation options involves the question of licensing uncertainties (i.e. the possibility that licensees may become involved in protracted adjudicatory hearings as a result of their conversion activities). This issue is addressed in the following section.

### **Licensing Issues Attendant to Conversion**

In the supplementary information section of the proposed rule, the Commission stated that it is considering the development of "generic envelopes" of safety limits for several types of non-power reactors. The Commission believed that these envelopes could be developed by (1) defining the licensing needs for various classes of reactors (e.g., for both normal operating conditions and potential accident scenarios); (2) reviewing the domestic and foreign data available through the RERTR and other fuel development and demonstration programs; and (3) assessing the feasibility of generic safety evaluation of safety analysis reports. The development of these generic envelopes could facilitate safety reviews attendant to the HEU/LEU fuel conversion process. Comments were invited on this approach and many were received from both supporters and opponents of the proposed rule. These comments can be divided into two general classes.

One class argued that conversion would require, in almost all cases, either a reactor "relicensing" (or new operating license) or a licensing amendment. The possibility of implementing conversion under §50.59 without amendment was generally considered unrealistic. Concerns were expressed that this "relicensing" or license amendment process

could lead to extensive licensing hearings brought about by intervenors and that costs related to such hearings could exceed the hardware costs of conversion. Some of these commenters cited the recent shutdown of the UCLA reactors as a pertinent example. Many commenters including several involved with the operation of non-power reactors at universities, indicated that they could not afford to engage in litigation against determined opponents and that even the perception of uncertainties about such litigation could influence decisions on continued reactor operation.

Following this line of argument, a few commenters recommended that the NRC undertake a rulemaking proceeding on the issue of generic licensing and that any changeover be contingent on a finding that safe operation of a non-power reactor would not be affected significantly by a conversion from HEU to LEU fuel. It was also suggested that the requirement in the proposed rule regarding the acquisition (or fabrication) of additional HEU fuel should be contingent on completion of the license changes necessary to accommodate use of LEU fuel. The potential need for the rule to provide, in any conversion process, for stepwise refueling to keep the reactor within present 10 CFR Part 73 requirements was also identified.

The other class of comments presented an opposite viewpoint, arguing that, even if conversion requires a license amendment, challengers can raise questions only on the narrowest of matters relevant to the subject of the amendment. Further, many commenters in this class opposed the idea of generic envelopes of safety limits for several types of non-power reactors, although some of them recognized the need for generic safety analysis of fuels. These commenters stated that if there are any questions about the safety of reactors due to conversion, the public should be allowed to address these safety questions in a public hearing. Others emphasized that safety margins should increase or remain equal to those currently approved by the NRC and that a license amendment should be required if margins are reduced. On the other hand, several commenters noted that interventions against the amendments required to accomplish conversion would be unlikely but that, indeed, failure to convert could lead to intervention in license renewal and license amendment proceedings.

The Commission has decided to forego, at least for the near term, any "generic envelope" safety rulemaking. While this rule resolves all issues as to need for conversion to LEU, it does not provide any generic resolution for any safety issues that may arise, in individual cases, in



connection with the changes in the license, facility or procedures made necessary by the conversion to a different fuel type from HEU to LEU.

After receipt of a license proposal for implementation of the conversion to LEU, NRC staff will conduct an appropriate evaluation for both implementation of the rule and for assuring the protection of the public health and safety in connection with any licensee-proposed changes in the license, facility, and procedures made necessary by the conversion. After the NRC staff evaluation, an appropriate enforcement order will be issued directing both the conversion and any necessary changes in the license, facility and procedures. It is expected that in most cases, if not all, that enforcement order will be in the form of an order to modify the license under 10 CFR 2.204.

In the event that any interested person should, in accordance with section 189a. of the Atomic Energy Act, request a hearing on the enforcement order, NRC staff will participate fully in the proceeding and will have the burden of defending the order. Thus, in the event a hearing is requested, the licensee need not participate in the hearing and may therefore avoid litigative expenses associated with the conversion and hearing. The Commission believes that this NRC staff role is consistent with the general policy that the costs of conversion to LEU should, to the maximum practical extent, be borne by the Federal Government.

### **International Significance of NRC-Mandated Conversions**

The Commission's view on the international and nonproliferation significance of the proposed domestic conversions was reflected in the Policy Statement of August 1982 (47 FR 37007, dated August 24, 1982). The Commission discussed in this Statement its interest in reducing, to the maximum extent possible, the use of HEU in domestic research and test reactors and, thereby encouraging conversion by foreign reactor operators. To assist in accomplishing this policy goal, the Commission made two commitments: First, to provide full support for DOE's RERTR program; and second, as part of the policy to strongly encourage conversion by foreign operators, to take steps to encourage similar action by U.S. non-power reactor operators. Subsequently, the Commission considered the proposed rule to limit the use of HEU fuel in domestic non-power reactors as such a step.

As to international and nonproliferation implications, the State Department stated that the proposed action could have some marginal effect on future negotiations with foreign non-power reactor operators regarding the need and timing for converting their own reactors. It also suggested to the NRC that converting some reactors might impose an undue technical or economic penalty. The Commission has responded to this comment by closely coupling conversion to Federal Government funding of conversion-related activities. Through this action, the Commission believes it has brought the criteria for the domestic conversion program in line with the no undue economic penalty criterion suggested by the Executive Branch for foreign non-power reactor operators. The Commission also recognizes that the development and demonstration of acceptable LEU replacement fuel and the conversion of larger DOE facilities can have a significant influence on foreign non-power reactor operators.

The proposed rule implied that HEU fuel at all licensed non-power reactors whether in a facility's inventory or in transit, has relatively equal proliferation significance. The State Department view is that no significant nonproliferation benefits are associated with conversion of "lifetime core" reactors, i.e., those reactors that were designed and built to operate over their entire life with the initial fuel load. Currently, 16 of 28 (originally 20 of 31) licensed facilities potentially affected by the final rule can be characterized as having lifetime cores. The Commission concludes that conversion of domestic non-power reactors will promote the common defense and security by reducing the risk of theft or diversion of HEU fuel at these reactors and the consequences to public health, safety and environment from such theft or diversion. Additionally, domestic conversions should generally encourage, in a symbolic way, conversions of foreign non-power reactors.

#### **Risk of Theft or Division of HEU Fuel**

Although the proposed rule to limit the use of HEU in non-power reactors was based primarily on international policy and nonproliferation considerations, the comments necessitated a reexamination of the "values" and "impacts" associated with further reductions in the domestic risk of theft or diversion of HEU fuel from NRC-licensed non-power reactors. This reexamination is summarized here. The complete responses to public comments are available from the NRC Public Document Room, under the title, "Limiting the Use of Highly Enriched Uranium in Domestic Research and Test Reactors, Responses to Public Comments," July 22, 1985. As stated above and explained below, the Commission concludes that the final

rule is based on domestic common defense and security and public health and safety considerations as well as on international and nonproliferation considerations.

In assessing the "value" of conversions in terms of residual risk reduction, the conservatisms in the current operating assumption of the likelihood of clandestine fission explosive (CFE) fabrication must be considered. Specifically, consideration must be given not only to the level of security provided, but also to: (1) The threat; (2) the ability of the intelligence community to give advance warning of a developing event or a planned malevolent act in sufficient time to implement additional countermeasures; (3) the deterrent value of irradiated fuel; (4) the length of time it would take to remove fresh or irradiated fuel from a facility (irradiated fuel would normally take longer); (5) the likelihood that an adversary would successfully process either fresh or irradiated fuel to obtain material which potentially could be used to construct a nuclear explosive device, and the time and resources required (processing of irradiated fuel is significantly more difficult); (6) the ability to find and retrieve nuclear material, if stolen (irradiated fuel would be easier to find); (7) the conservatism built into the 5-kilogram formula quantity for U-235 - see generally §§ 73.1(a) and 73.2(bb)(the presence of fission products would increase the conservatism of this number); and (8) the likelihood that an adversary could successfully construct a nuclear explosive device (the presence of fission products would make this more difficult). All of these factors have an impact on the assessment of the likelihood that an adversary could construct a CFE through diversion or theft of HEU fuel from non-power reactors. To complete the evaluation of risk, the range of consequences has been considered in the event of a successful theft or diversion of any quantity of HEU fuel from licensed non-power reactors. The resultant reduction of risks can be balanced against the incurred costs. As explained above, the costs for conversion for all affected licensees includes a quantifiable component, currently estimated as \$12-16 million. In addition, nonquantifiable costs have been identified, including any licensing cost associated with potential hearings and potential losses in functional capabilities at affected facilities. As discussed above, virtually all costs will be borne by the Federal Government. The Commission also believes, based on comments received on the proposed rule, that promulgation of this final rule will involve a benefit to licensees. The Commission's conclusion, based on the cost/benefit evaluation, is to proceed with promulgation of this final rule, in order to fulfill its obligations under the Atomic Energy Act to promote the common defense and security and to

protect the health and safety of the public, as well as to permit the continued conduct of widespread and diverse research and development.

### **III. Revisions to the Proposed Rule**

#### **1. Section 50.2 - Formerly §50.64 (b) of the Proposed Rule**

This section has been expanded to include definitions of "Federal Government funding for conversion," "Fuel acceptable to the Commission," and several other definitions identified in § 50.64(b) of the proposed rule. These definitions have not been included in § 50.2 for easy and consistent reference. The first definition was necessary to couple conversion actions by licensees to the funds necessary to accomplish the conversion process. The second definition was needed to indicate that those non-power reactors meeting the unique purpose provision of the rule must use HEU fuel of enrichment as close to 20% as is available and acceptable to the Commission.

In addition, the unique purpose definition, stated in § 50.64(b)(5)(1) of the proposed rule, has been expanded to define more precisely the specific experiment, program or commercial activity that justifies continued use of HEU fuel. The change is also intended to limit consideration of activities to those having merit for research purposes, and not because they may have some economic benefit. The Commission itself will make the final decision on any conversion requirement based upon a finding of unique purpose.

#### **Section 50.64(b) - Formerly § 50.64(c) the Proposed Rule**

The changes to § 50.64(c), now § 50.64(b), include minor word changes in § 50.64(b) (1) and (2) and two clarifications in § 50.64 (b) (2). The proposed rule would not have allowed a licensee to acquire additional HEU fuel if LEU fuel acceptable to the Commission for that reactor were available. Since a few of the affected non-power reactors refuel frequently enough to require "lead times" for fuel acquisition, the wording could have caused an unnecessary shutdown of these facilities until acceptable LEU fuel was available for use in the reactor. The background statement to the proposed rule indicated that the conversion schedule could include consideration of reactor usage which could apply to these situations. To clarify the final rule's intent, § 50.64(b)(2)(1) has been modified so that a licensee is required not to initiate acquisition of additional HEU fuel if LEU fuel acceptable to the Commission is available.

The change in § 50.64(b)(3) is intended to limit the scope of use of HEU fuel while allowing the use of fuel that is acceptable to the Commission but is slightly different from that needed to meet the strict definition of LEU weight percent of U-235. Such fuel might be required, in isolated instances, because of non-power reactor's core geometry and conditions for operation. However, the Commission wishes to see all licensees go to fuel as close to 20% enrichment as possible.

#### **4. Section 50.64(c) - Formerly § 50.64 (d) of the Proposed Rule**

The changes in § 50.64(c)(2)(i) and the inclusion of § 50.64(c)(2)(ii) have been made to couple implementation of the rule to the availability of Federal Government funding in order to cover the costs of conversion.

#### **Finding of No Significant Environment Impact: Availability**

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment and that, therefore, an environmental impact statement is not required. Basically, the rule places limitations on the use of HEU fuel in domestic research and test reactors. In so doing, the risk of theft or diversion of HEU will be reduced. Neither the safe operation, nor any routine release of radioactivity from the affected reactors will be changed in any significant manner. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, 1717 H Street NW., Washington, DC. Single copies of the environmental assessment and the finding of no significant impact are available from F.P. Gillespie, U.S. Nuclear Regulatory Commission, Washington, DC 20555, (301) 443-7936.

#### **Paperwork Reduction Act Statement**

The final rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). These requirements were approved by the Office of Management and Budget approval number 3150-0011.

## **Regulatory Analysis**

The Commission has prepared a regulatory analysis on this final regulation. The analysis examines the costs and benefits considered by the Commission. The analysis is available for inspection and copying for a fee at the NRC Public Document Room, 1717 H Street NW., Washington, DC 20555. Single copies of the analysis may be obtained from F.P. Gillespie, Office of Nuclear Regulatory Research, Nuclear Regulatory Commission, Washington, DC 20555, (301) 443-7936.

## **Regulatory Flexibility Certification**

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this rule does not have a significant economic impact on a substantial number of small entities. This rule affects non-power reactor licensees that own and operate facilities licensed under sections 103 and 104 of the Atomic Energy Act of 1954, as amended. These licenses do not fall within the definition of small businesses set forth in section 3 of the Small Business Act, 15 U.S.C. 632, or within the Small Business Size Standards set forth in 13 CFR Part 121.

## **List of Subjects in 10 CFR Part 50**

Antitrust, Classified information, Fire prevention, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, Reporting and record keeping requirements.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is adopting the following amendments to 10 CFR Part 50.

## **Part 50 - [Amended]**

1. The authority citation for Part 50 continues to read as follows;

Authority: Sec. 103, 104, 161,182, 183, 186, 189, 68 Stat. 936, 937, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2133, 2134, 2201, 2232, 2233, 2239, 2282); secs. 201, 202, 206, 88 Stat. 1242, 1244, (42 U.S.C. 5841, 5842, 5846), unless otherwise noted.

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5851). Sections 50.57(d), 50.58, 50.91 and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2701, 2073 (42 U.S.C. 2133, 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80-50.81 also issued under sec. 184, 88 Stat. 954, as amended (42 U.S.C. 2234). Sections 50.100-50.102 also issued under sec. 188, 68 Stat. 955 (42 U.S.C. 2236).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 50.10 (a), (b), and (c), 50.44, 50.46, 50.48, 50.54 and 50.80(a) are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); §§ 50.10 (b) and (c) and 50.54 are issued under sec. 161i, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 50.55(e), 50.59(b), 50.70, 50.71, 50.72, 50.73, and 50.78 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

## § 50.2 [Amended]

2. In § 50.2, add the following new definitions in the proper alphabetical sequence.

"Federal government funding for conversion" means funds appropriated to the Department of Energy or to any other Federal Agency to pay directly to or to reimburse non-power reactor licensees for costs attendant to conversion.

"Fuel acceptable to the Commission" means that the fuel replacing the existing HEU fuel in a specific non-power reactor (1) meets the operating requirements of the existing license or, through appropriate NRC safety review and approval, can be used in a manner which protects public health and safety and promotes the common defense and security; and (2) meets the Commission's policy of limiting, to the maximum extent possible, the use of HEU fuel in that reactor.

"Highly enriched uranium (HEU) fuel" means fuel in which the weight percent of U-235 in the uranium is 20% or greater. Target material, special instrumentation, or experimental devices using HEU are not included.

"Low enriched uranium (LEU) fuel" means fuel in which the weight percent of U-235 in the uranium is less than 20%.

"Non-power reactor" means a research or test reactor licensed under §§ 50.21(c) or 50.22 of this part for research and development.

"Unique purpose" means a project, program, or commercial activity which cannot reasonably be accomplished without the use of HEU fuel, and may include: (1) A specific experiment, program, or commercial activity (typically long-term) that significantly serves the U.S. national interest and cannot be accomplished without the use of HEU fuel; (2) Reactor physics or reactor development based explicitly on the use of HEU fuel; (3) Research projects based on neutron flux levels or spectra attainable only with HEU fuel; or (4) A reactor core of special design that could not perform its intended function without using HEU fuel.

3. In § 50.8, paragraph (b) is revised to read as follows.:

§ 50.8 Information collection requirements: OMB approval.

\* \* \* \* \*

(b) The approved information collection requirements contained in this part appear in § § 50.30, 50.33, 50.33a, 50.34, 50.34a, 50.35, 50.36, 50.36a, 50.48, 50.49, 50.54, 50.55, 50.55a, 50.59, 50.60, 50.64, 50.71, 50.72, 50.80, 50.82, 50.90, 50.91, and Appendixes A, B, E, G, H, J, K, M, N, and R.

4. A new § 50.64 is added to read as follows:

§ 50.64 Limitations on the use of highly enriched uranium (HEU) in domestic non-power reactors.

(a) *Applicability.* The requirements this section apply to all non-power reactors.

(b) *Requirements.* (1) The Commission will not issue a construction permit after March 27, 1986 for a non-power reactor where the applicant proposes to use highly enriched uranium (HEU) fuel, unless the applicant demonstrates that the proposed reactor will have a unique purpose as defined in § 50.2.

(2) Unless the Commission has determined, based on a request submitted in accordance with paragraph (c)(1) of this section, that the non-power reactor has a unique purpose, each licensee authorized to possess and use HEU fuel in connection with the reactor's operation shall:



(i) Not initiate acquisition of additional HEU fuel, if low enriched uranium (LEU) fuel acceptable to the Commission for that reactor is available when it proposes that acquisition; and

(ii) Replace all HEU fuel in its possession with available LEU fuel acceptable to the Commission for that reactor, in accordance with a schedule determined pursuant to paragraph (c)(2) of this section.

(3) If not required by paragraphs (b) (1) and (2) of this section to use LEU fuel, the applicant or licensee must use HEU fuel of enrichment as close to 20% as is available and acceptable to the Commission.

(c) *Implementation.* (1) Any request by a licensee for a determination that a non-power reactor has a unique purpose as defined in § 50.2 should be submitted with supporting documentation to the Director of the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555, by September 29, 1986.

(2) (i) By March 27, 1987 and at 12-month intervals thereafter, each licensee of a non-power reactor authorized to possess and use HEU fuel shall develop and submit to the Director of the Office of Nuclear Reactor Regulation a written proposal for meeting the requirements of paragraphs (b) (2) or (3) of this section. The licensee shall include in the proposal a certification that Federal Government funding for conversion is available through the Department of Energy (DOE) or other appropriate Federal Agency. The licensee shall also include in the proposal a schedule for conversion, based upon availability of replacement fuel acceptable to the Commission for that reactor and upon consideration of other factors such as the availability of shipping casks, implementation of arrangements for the available financial support, and reactor usage.

(ii) If Federal Government funding for conversion cannot be certified, the proposal's contents may be limited to a statement of this fact. If a statement of non-availability of Federal Government funding for conversion is submitted by a licensee, then it shall be required to resubmit a proposal for meeting the requirements of paragraphs (b) (2) or (3) of this section at 12-month intervals.

(iii) The proposal shall include, to the extent required to effect the conversion, all necessary changes in the license, facility, or procedures. Supporting safety analyses should be provided so as to meet the schedule established for conversion. As long as Federal Government funding for conversion is not available, the resubmittal may be a reiteration of the original proposal. The Director of the Office of Nuclear Reactor Regulation shall review the proposal and confirm the status of Federal Government funding for conversion and, if a schedule for conversion has been submitted by the licensee, will then determine a final schedule.

(3) After review of the safety analysis required by paragraph (c)(2), the Director of the Office of Nuclear Reactor Regulation will issue an appropriate enforcement order directing both the conversion and, to the extent consistent with protection of the public health and safety, any necessary changes to the license, facility, or procedures.

### **Separate Views**

Chairman Palladino supports Federal funding for all conversion. However, in the event that no Federal funds are provided, the view of Chairman Palladino is that no conversion should be required. The Chairman also believes that, in the event that Federal funds are provided for university reactors but not for commercial non-power reactors, then the latter should still be required to convert to LEU, notwithstanding the lack of Federal Funds.

Commissioner Asselstine believes that the conversion of commercial non-power reactors should not be contingent upon federal funding. The Federal government historically has provided significant support to *university* research and test reactor programs. In fact, it was this long-standing relationship with the university non-power reactors, coupled with the concern on the part of the university reactor operators of excessive costs and protracted litigation, which led the Commission to support federal funding for conversion. There was never any discussion on the part of the Commission of how requiring conversions of the commercial non-power reactors would create a severe financial hardship for the commercial concerns. Commissioner Asselstine believes that if federal funds are not provided for the conversion of commercial non-power reactors, then the rule should require these licensees to convert to LEU notwithstanding the lack of federal funding. He believes that it is most unfortunate that the Commission has created a loophole in its rule whereby these commercial non-power reactors will never be required to convert to LEU if Federal funding is not provided.

Dated at Washington, DC this 20th day of February, 1986.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

*Secretary of the Commission*

[FR Doc. 86-4031 Filed 2-24-86; 8:45am]

BILLING CODE 7590-01-M