

the RERTR program and stating that the NRC would act expeditiously to review the use of new LEU fuel types in non-power reactors (hereafter research and test reactors) (47 FR 37007, August 24, 1982). In addition, the NRC stated that each HEU export license application will continue to be closely scrutinized to verify that the HEU export meets U. S. statutory requirements. In 2004, the RERTR program became part of the Global Threat Reduction Initiative (GTRI)¹ conducted by DOE's National Nuclear Security Administration (NNSA).

The structure of 10 CFR 50.54 recognizes certain limitations in the effort to convert research and test reactors from HEU to LEU. Since the inception of the RERTR program, it has been recognized that the process of converting from HEU to LEU fuel would require significant funding from Congress and would take a considerable amount of time. Because research and test reactors have special design features, conversion to LEU requires long lead times for developing, designing and testing new types of fuel to avoid serious losses in performance.

However, § 50.64 provides regulatory controls that directly address the limitations of time and funding. Until NRC-licensed research and test reactors are converted from HEU to LEU fuel, each domestic research and test reactor using HEU is required by 10 CFR 50.64(c)(2) to submit an annual certification to the NRC on whether or not DOE funding for the LEU conversion is available along with a schedule of the conversion process. As indicated, Congress provides the funding to DOE to support the HEU to LEU conversion of research and test reactors, and therefore, speed and priority of the LEU conversion process is not under NRC's control. ←

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With regard to the detection of HEU crossing U. S. borders, although the NRC works with the U. S. Department of Homeland Security (DHS) in the event there is a potential threat at the U. S. border from the export or import of radioactive materials, the NRC has no authority over

¹ For more information about the GTRI program see http://nnsa.energy.gov/nuclear_nonproliferation/1550.htm.

the range of 1 percent to 2 percent. The commenter feels that this would not be an undue burden to the licensees to improve national security. (PSR 2)

NRC Response 2: As noted above, the NRC may only exercise its export licensing authority within the confines of the statutory scheme and congressional policies reflected in the AEA. While the AEA establishes strict requirements for all NRC licensed exports of special nuclear material (i.e., the export licensing criteria under AEA section 127 must be met, the NRC must have an AEA section 123 agreement for cooperation with the recipient country, and the NRC must find that the export would not be inimical to the common defense and security or the public health and safety of the U.S.), it establishes no congressional policy to ~~outright ban~~ NRC licensing of HEU exports regardless of whether the statutory criteria are satisfied.

In the Energy Policy Act of 1992 (EPAct 1992), Congress amended the AEA to require the NRC to adopt additional, more stringent criteria specifically for licensing exports of HEU. Under Section 134 of the AEA, the NRC may issue a license for the export of HEU to be used as a fuel or target in a nuclear research or test reactor only if, in addition to meeting the other AEA requirements for exports of special nuclear material, the NRC determines that:

(1) There is no alternative nuclear reactor fuel or target enriched to a lesser percent than the proposed export that can be used in the foreign reactor;

(2) The proposed recipient of the uranium has provided assurances that, whenever an alternative nuclear reactor fuel or target can be used in that reactor, it will use that alternative in lieu of HEU; and

(3) The U.S. Government is actively developing an alternative nuclear reactor fuel or target that can be used in that reactor.

Sciences (NAS) to conduct a study² to determine:

- (1) The feasibility of procuring supplies of medical radioisotopes from commercial sources that do not use HEU;
- (2) The current and projected demand and availability of medical radioisotopes in regular current domestic use;
- (3) The progress that is being made by DOE and others to eliminate all use of HEU in reactor fuel, reactor targets, and medical radioisotope production facilities; and
- (4) The potential cost differential in medical radioisotope production in the reactors and target processing facilities if the products were derived from LEU.

X The NAS study was issued ^{in [month] of [year]} ~~earlier this year~~, and identifies additional steps that could be taken by DOE and the medical radioisotope producers to improve the feasibility of HEU to LEU conversions. By August 2010, DOE is required to submit a report to Congress regarding the NAS findings, and on whether any commercial producers have committed to provide domestic requirements for medical radioisotopes without using HEU. Under the EPAct 2005, if any such commercial producers later become capable of meeting domestic requirements for medical radioisotopes without using HEU, the DOE is required to certify this to Congress, in which case the NRC will, by rule, terminate its review of HEU export license applications.

Therefore, the NRC does not believe that Comment 2 provides a basis for granting the rulemaking petition.

Comment 3: A total of 4,744 members of the public submitted the same comment urging the NRC to end the civilian use of HEU. The commenters believe that HEU could be diverted

² National Academies of Science Report: "Medical Isotope Production Without Highly Enriched Uranium"; http://www.nap.edu/catalog.php?record_id=12569

and used to build an improvised nuclear weapon and is simply too dangerous for continued commercial use here and abroad. In addition, these commenters express concerns that the facilities housing the nuclear material are poorly secured. These commenters state that recent studies have shown that radiation monitors cannot reliably detect HEU being smuggled into, and out of, the United States, so the most reliable plan would be to replace and ban its commercial sources. These commenters also state that a U.S. move to ban the use of HEU would signal to other countries the critical need to eliminate the use of HEU. (FORM 1, FORM 3).

NRC Response 3: As previously discussed, the AEA does not authorize the NRC to ban outright the civilian use of HEU under all circumstances. Nor does the AEA authorize the NRC to deny export licenses solely to promote certain foreign policy objectives, such as encouraging other countries not to use HEU.

The NRC can only act within the bounds of its regulatory authority under the AEA to protect the public health and safety and the common defense and security. As a regulator, the NRC has enacted a comprehensive regulatory structure to strictly control licensing of facilities for domestic use of HEU, as well as licensing of exports of HEU. In addition to NRC regulations, the NRC is confident that international treaties and standards governing possession, use, and export of HEU ensure that adequate controls are employed to reduce the risks of theft of HEU from civilian research and test reactors and medical radioisotope production facilities. In addition, the NRC participates in U.S. Government consultations with the governments of countries seeking exports of HEU from the United States. These consultations include an assessment of the security of facilities that will receive U.S. origin HEU, so the security of the facilities can be considered in determining whether an export license should be approved.

Given these controls, the likelihood of acquiring ^{U.S. origin} HEU from a facility in the U.S. or elsewhere in ^{U.S. origin} amounts sufficient to make an improvised nuclear weapon is considered very remote. HEU fuel

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is manufactured, shipped, and maintained in limited quantities so that acquiring an amount necessary to make a weapon would be very difficult. Further, the GTRI program continues to make progress and to support the conversion of domestic and foreign research and test reactors from HEU to LEU fuel. ^{by inclusion} Converting HEU fuel into a form suitable for use as a weapon requires considerable technical expertise, due to its physical nature and design.

The security of research and test reactors is regulated through requirements located in 10 CFR Part 73 of the Commission's regulations. The specific security measures that are required vary depending on several factors, which include the quantity and type of special nuclear material possessed by the licensee, as well as the power level at which the licensee is authorized to operate. 10 CFR 73.60 and 73.67 require, at a minimum, that each research and test reactor that stores and uses special nuclear material in controlled access areas ⁽¹⁾ monitor the controlled access areas for unauthorized activities, and ⁽²⁾ ensure that there is a response to all unauthorized activities. These regulations also require that unescorted access to the controlled access areas be limited to authorized individuals. The research and test reactors implement these requirements on a site-specific basis through their security plans and procedures.

Subsequent to September 11, 2001, the NRC evaluated the adequacy of security at research and test reactors and considered whether additional actions should be taken to help ensure the trustworthiness and reliability of individuals with unescorted access. The licensees were advised to consider taking immediate additional precautions, including observation of activities within their facility. The NRC evaluated these additional measures at each facility during the remainder of 2001. From 2002 through 2004, research and test reactors voluntarily implemented compensatory measures that included site specific background investigations for individuals granted unescorted access. The NRC has also conducted security assessments at certain research and test reactors which helped to identify risk-significant areas and materials.

In addition to the implementation of site-specific background investigations, the NRC issued orders to all RTRs in April 2007 (72 FR 25337, May 4, 2007), requiring fingerprinting for an FBI identification and criminal history record check for all individuals granted unescorted access to special nuclear material at the facility. The NRC is also ~~undergoing~~^{making} rulemaking to codify unescorted access requirements for RTRs similar to those that were imposed by the April 2007 orders. (See Advanced Notice of Proposed Rulemaking, 74 FR 17115, April 14, 2009).

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As stated in the NRC response to Comment 1, DHS is responsible for protecting the borders of the U.S., and the adequacy of the radiation detectors and other types of equipment used for this purpose.

Under the GTRI program, DOE is responsible for developing, testing, and qualifying the LEU fuel, and for funding the facilities to be converted. The speed of the HEU conversion program is dependent on the successful DOE testing of the new LEU fuel design and the funding provided by Congress. The NRC role is to conduct timely reviews of the license amendment requests to approve the operation with LEU fuel.

Therefore, the NRC does not believe that Comment 3 provides a basis for granting the rulemaking petition.

Comment 4: Five commenters did not agree with the petitioner that a firm date is needed when the NRC will no longer license the domestic use of civilian HEU. Although all of them supported the idea to convert to the use of LEU as quickly as possible, they stated that there are technical, economic, and safety issues that must be addressed first. (TRTR 1, UM 1, MIT 1, CORAR 1, & DOE 1)

NRC Response 4: For many of the reasons already discussed in this notice, the NRC generally agrees with this comment. As stated previously, the NRC's view is that the current

that there are a limited number of foreign facilities producing the isotope, the reactors where the targets are irradiated are over 40 years old, and these reactors are used for numerous other types of nuclear research. While there is interest in developing a domestic LEU-based production capability, it is not yet known if or when this capability will become available. ← Insert from p.19

However, in order to license an export of HEU for medical isotope production, the NRC must ensure that all of the applicable statutory requirements, including Section 134 of the AEA, are satisfied. If those statutory requirements are not met, the NRC is not authorized to grant a requested license.

Comment 6: A commenter states that, contrary to the petitioner's belief that a ban on the civilian use of HEU would lead other countries to take similar actions, other countries will not likely follow the U.S. in banning the civilian use of HEU, and that the allies of the U.S. have already joined us to reduce and secure their stocks and uses of HEU. If the petition is granted, the commenter states that would create a false sense of security because the real problem is the potential diversion and lack of inventory control from the countries that made up the former Soviet Union. (TRTR 3)

NRC Response 6: Although the NRC fully supports the efforts of the DOE programs, these activities are not under NRC jurisdiction. However, the NRC believes that DOE's GTRI program is working to address the concerns the commenter mentions.

Determination of Petition

The NRC has determined that the petitioner has not provided an adequate basis on which the NRC could act to implement the proposed changes requested by the petitioner. To the extent that the NRC has authority to act, the NRC's position is that the current regulatory framework in conjunction with DOE's GTRI program already works effectively to minimize the use and export of HEU material until a suitable LEU replacement is available. In addition,

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In addition,
though not essential to the NRC's decision, the NRC acknowledges that banning the use of HEU without a suitable LEU replacement in place would result in significant negative impacts relative to the operation of these research and test reactor facilities, and would likely result in the loss of the research and development benefits these facilities provide. *Further,* banning HEU without a suitable LEU replacement would also affect the production of vital radioisotopes used for medical diagnostics and therapies, and would likely lead to or exacerbate shortages of these medical radioisotopes in the United States. These shortages would have a major negative impact on patient care. *In summary,*

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With respect to export license applications for HEU, bearing in mind the NRC's responsibility to make an overall finding that each export would not be inimical to the common defense and security of the U.S., the NRC intends to continue its practice to carefully review each application to verify that each requested HEU export is justified in accordance with its statutory and regulatory obligations. The NRC will continue to monitor the progress of DOE's GTRI and RERTR programs, including the HEU to LEU conversion schedules.

The NRC will also continue to encourage that the appropriate actions be taken to eliminate U.S.-supplied-inventories of HEU in a manner consistent with the EPAct 2005 requirements.

For reasons cited in this document, the NRC denies the petition.

Dated at Rockville, Maryland, this _____ day of _____, 2009.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,
Secretary of the Commission.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

Mr. Thomas B. Cochran, Ph.D.
Mr. Matthew G. McKinzie, Ph. D.
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Dear Gentlemen:

I am responding to your letter of March 24, 2008, by which you submitted to the U.S. Nuclear Regulatory Commission (NRC) a petition for rulemaking (PRM) on behalf of the Natural Resources Defense Council (petitioner) concerning the use and export of high enriched uranium (HEU). You requested that Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.64 and Part 70, be amended. The petition was docketed as PRM-50-90. A notice of receipt and request for public comment on PRM-50-90 was published in the *Federal Register*.

The NRC received 4,764 letters with public comments on the petition. ^{as follows:} ~~These comments were submitted by States, private organizations, and members of the U.S. Congress. Three~~ ^{two} ~~comments were from States or their Congressional Representative, three from private companies, ten from associated organizations, one from a private individual, two from State universities, one from the U.S. Department of Energy (DOE), and 4,744 electronic form comments generated by the public through your website.~~

As discussed further in the enclosed notice which will be published in the *Federal Register*, the NRC is denying PRM-50-90. The NRC finds that the requested rulemaking did not demonstrate that the existing NRC licensing, security and export regulations do not currently provide reasonable assurance of adequate protection of the public health and safety, and the common defense and security of the United States. The requested regulatory changes appear primarily to be founded on foreign policy and national security concerns that are beyond the NRC's statutory purview under the Atomic Energy Act of 1954, as amended. The current regulatory framework, in conjunction with DOE's Global Threat Reduction Initiative already works effectively to minimize the use and export of HEU material until a suitable replacement is available. In addition, granting the petition could interfere with the supply of medical radioisotopes which are currently produced by foreign facilities that use HEU targets, and disrupt the operation of research and test reactors in the U.S. which currently require HEU fuel to operate. This could have negative impacts on patient care in the United States, and on engineering and research programs. The NRC has concluded its evaluation of PRM-50-90; therefore, this PRM is considered closed.