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Part IV

Department of Energy

Record of Decision for the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel; Notice

DEPARTMENT OF ENERGY

Record of Decision for the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel

AGENCY: Department of Energy.

ACTION: Record of decision.

SUMMARY: DOE, in consultation with the Department of State, has decided to implement a new foreign research reactor spent fuel acceptance policy as specified in the Preferred Alternative contained in the *Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* (the Final EIS, DOE/EIS–218F of February 1996), subject to additional stipulations specified in Section VII of this Record of Decision. The new policy applies only to aluminum-based and TRIGA (Training, Research, Isotope, General Atomics) foreign research reactor spent nuclear fuel and target material containing uranium enriched in the United States. The purpose of the acceptance policy is to support the broad United States' nuclear weapons nonproliferation policy calling for the reduction and eventual elimination of the use of highly enriched (weapons-grade) uranium in civil commerce worldwide.

EFFECTIVE DATE: The new policy set forth in this Record of Decision is effective upon being made public May 13, 1996, in accordance with DOE's NEPA implementation regulations (10 CFR § 1021.315).

ADDRESSES: Copies of the *Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* (DOE/EIS–0218F, the Final EIS) and this Record of Decision are available in the public reading rooms and libraries identified in the **Federal Register** Notice that announced the availability of the Final EIS (61 FR 6983, February 23, 1996), or by calling 1–800–736–3282 (toll free).

FOR FURTHER INFORMATION CONTACT: For information on the management of foreign research reactor spent nuclear fuel or this Record of Decision contact: Mr. Charles Head, Program Manager, Office of Spent Fuel Management (EM–67), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585, Telephone (202) 586–9441.

For information on DOE's National Environmental Policy Act (NEPA) process, contact: Ms. Carol Borgstrom, Director, Office of NEPA Policy and Assistance (EH–42), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585, Telephone (202) 586–4600, or leave message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

I. Synopsis of the Decision

The U.S. Department of Energy (DOE) and the Department of State jointly issued the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (the Final EIS, DOE/EIS–218F) on February 16, 1996. In this Final EIS, DOE and the Department of State considered the potential environmental impacts of a proposed policy to manage spent nuclear fuel from foreign research reactors. After consideration of the Final EIS, public comments submitted on the Draft EIS and concerns expressed following issuance of the Final EIS, DOE, in consultation with the Department of State, has decided to implement the proposed policy as identified in the Preferred Alternative contained in the Final EIS, subject to additional stipulations specified in Section VII of this Record of Decision. This implementation will involve acceptance of approximately 19.2 MTHM (metric tonnes of heavy metal) of foreign research reactor spent fuel and approximately 0.6 MTHM of target material into the United States over a 13 year period, beginning on the effective date of the policy. The spent fuel will be received from abroad through the Charleston Naval Weapons Station in South Carolina (about 80%) and the Concord Naval Weapons Station in California (about 5%). Most of the target material and some of the spent fuel (about 15%) will be received overland from Canada. Shipment through Charleston is expected to begin in the summer of 1996 and through Concord in mid-1997. Shipments from Canada have not been scheduled at this time. The Final EIS demonstrates that the spent fuel and target material could be safely transported overland within the United States by either truck or rail, and DOE has decided that either transportation mode may be used. Nevertheless, based on initial input from the public near the ports of entry indicating a preference for shipment by rail, DOE will generally seek to use rail for shipments from the ports of entry to DOE facilities at the Savannah River Site in South Carolina and the Idaho National Engineering Laboratory in Idaho. The particular mode of transportation to be used will be determined after further discussions between DOE and State, Tribal and local officials. After a limited period of interim storage, the spent fuel will be treated and packaged, or chemically separated, at the Savannah River Site and Idaho National Engineering Laboratory as necessary to prepare it for transport to a final disposal repository.

II. Background

Beginning in the 1950's, as part of the ''Atoms for Peace'' program, the United States provided nuclear technology to foreign nations for peaceful applications in exchange for their promise to forego development of nuclear weapons. A major element of this program was the provision of research reactor technology and the highly enriched uranium (HEU) needed in the early years to fuel the research reactors. Research reactors play a vital role in important medical, agricultural, and industrial applications. Nevertheless, the highly enriched uranium initially used in the fuel elements for these reactors can also be used in nuclear weapons. In the past, after irradiation in the research reactor, the used fuel elements (often referred to as ''spent nuclear fuel'' or ''spent fuel'') were transported to the United States, where they were chemically separated to extract the uranium still remaining in the spent nuclear fuel. In this way, the United States maintained control over disposition of the HEU that it provided to other nations.

Before 1964, bilateral agreements with the countries operating research reactors provided for the lease of the enriched uranium, with explicit provision for the return of the spent nuclear fuel to the United States. After 1964, most agreements provided for the sale of this material to the foreign nation, and the United States began to operate under a policy known as the ''Off-Site Fuels Policy'', under which the United States continued to accept, temporarily store, and chemically separate the spent nuclear fuel.

Research reactors have become the major civilian users of HEU. To further reduce the danger of nuclear weapons proliferation, the United States in 1978 initiated the Reduced Enrichment for Research and Test Reactors (RERTR) program, which was aimed at reducing the use of HEU in civilian programs by promoting the conversion of foreign and domestic research reactors from HEU fuel to low enriched uranium (LEU) fuel (LEU cannot be used directly in nuclear weapons). As part of the RERTR program, DOE developed LEU fuel and

worked with foreign research reactor operators to convert their reactors to run on such fuel.

The foreign research reactor operators who converted to LEU fuel did so in support of nuclear weapons nonproliferation objectives, even though such conversions were expensive and generally resulted in reduced reactor capabilities and increased operating costs. From the beginning of the RERTR program, foreign research reactor operators made it clear that their willingness to convert their research reactors to LEU fuel was contingent upon the continued acceptance by DOE of their spent nuclear fuel for disposition in the United States.

The United States accepted foreign research reactor spent nuclear fuel until the ''Off-Site Fuels Policy'' expired (in 1988 for HEU fuels and 1992 for LEU fuels). At that time, DOE committed to conduct an environmental review of the impacts of extending the program for accepting foreign research reactor spent nuclear fuel. In 1991, DOE issued an environmental assessment of the potential environmental impacts of the proposed extension. DOE received numerous comments from the public stating that a new, long-term policy should not be implemented until an EIS had been prepared. DOE decided in mid-1993 to prepare an EIS to evaluate the impacts of implementing a new foreign research reactor spent nuclear fuel acceptance policy.

On October 21, 1993, DOE published a Notice of Intent (NOI) (58 FR 54336) to prepare an environmental impact statement on a proposed policy for the acceptance of foreign research reactor spent nuclear fuel containing uranium enriched in the United States. The NOI announced public scoping meetings and requested public comments and suggestions for DOE to consider in its determination of the scope of the EIS. Nine public scoping meetings were held in November and December 1993. DOE received a total of 2,215 scoping comments from 493 commentors.

On April 21, 1995, DOE published a Notice of Availability (60 FR 19899) of the Draft EIS. The Draft EIS analyzed three Management Alternatives for implementing the proposed action:

Management Alternative 1—Accept and manage foreign research reactor spent nuclear fuel in the United States;

Management Alternative 2—Facilitate the management of foreign research reactor spent nuclear fuel overseas; and

Management Alternative 3—A hybrid, or combination, of elements from the first two Management Alternatives.

During the 90-day public comment period (April 21, 1995 to July 20, 1995), about 900 individuals attended 17 public hearings held in or near candidate ports, management sites, and in Washington, DC. In addition to oral comments, DOE received approximately 5,040 written comments contained within approximately 1,250 comment documents on a wide range of policy, economic, and technical issues. Many commentors supported the United States' nuclear weapons nonproliferation policy objective of seeking to reduce the use of HEU (i.e., nuclear weapons-grade uranium) in civil commerce. However, the comments also reflected a wide range of views as to which Management Alternative should be adopted. Some commentors supported management of the spent nuclear fuel in the United States. Other commentors questioned the need to accept spent nuclear fuel from allies of the United States and those countries that appear to have the capability to manage their own spent nuclear fuel abroad. These commentors generally believed that such spent nuclear fuel should be managed overseas. With regard to implementation of the policy in the United States, some commentors preferred the use of military ports, a practice DOE has followed in the recent past based on strong public preference. Risks during transport, including those from terrorism, a sunken cask, severe shipboard fires, and the level of emergency preparedness at ports were frequently raised as matters of concern.

In consideration of public comments, DOE added information to the Final EIS, including: clarification of the proposed United States policy on accepting spent nuclear fuel from allies; examination of the consequences of sabotage or terrorist attack; safety of transportation casks; re-examination of the shipboard fire analysis; and general descriptions of transportation and emergency response regulations and management activities related to safe transport of the spent fuel and target material. In addition, the Naval Weapons Station at Charleston, South Carolina was analyzed along with the other terminals of the port of Charleston that had been included in the Draft EIS.

On February 23, 1996, the U.S. Environmental Protection Agency published a Notice of Availability (61 FR 6983) of the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (DOE/EIS–0218F of February 1996), after DOE had distributed approximately 3,000 copies of the EIS and/or the EIS Summary to government officials and interested groups and individuals.

DOE has prepared this Record of Decision in accordance with the regulations of the Council on Environmental Quality for Implementing NEPA (40 CFR Parts 1500–1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021). This Record of Decision is based on DOE's Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (the Final EIS). In making the decisions announced in this Record of Decision, DOE, in consultation with the Department of State, considered environmental impacts and other factors, such as nuclear weapons nonproliferation policies; public comments received on the Draft EIS and concerns expressed following issuance of the Final EIS; analysis of impacts and alternatives in the DOE Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (DOE/EIS–0203–F of April 1995, the ''Programmatic SNF&INEL EIS'') and the Records of Decision for that EIS (60 FR 28680, June 1, 1995 and 61 FR 9441, March 8, 1996).

III. Policy Considerations

A key goal of United States' nuclear weapons nonproliferation policy is to reduce international civil commerce in HEU, since HEU can be used directly in the production of nuclear weapons. The proposal by DOE and the Department of State to adopt a policy to manage foreign research reactor spent nuclear fuel containing uranium enriched in the United States is intended to support efforts by the United States to convert foreign research reactors from HEU to LEU fuels (the latter cannot be used directly in nuclear weapons) and to gain worldwide acceptance of the use of LEU fuels in new research reactors.

Failure of the United States to manage foreign research reactor spent nuclear fuel could have a number of adverse consequences. Foreign governments and research reactor operators have participated in the RERTR program in large part because the United States previously accepted the spent nuclear fuel from their research reactors. The United States has not accepted HEU spent nuclear fuel for more than seven years, with the exception of recent limited shipments made after completion of the Environmental Assessment of Urgent-Relief Acceptance

of Foreign Research Reactor Spent Nuclear Fuel (DOE/EA–0912, April 1994). As a result, several foreign research reactor operators are running out of space to store their spent nuclear fuel, and others will run out soon. Under such conditions, the foreign research reactor operators must either shut down their reactors, construct new storage facilities, or ship the spent nuclear fuel offsite for storage or reprocessing. Many of the reactor operators do not have the option of increasing their storage capacities due to local regulatory restrictions. Moreover, construction and licensing of new storage facilities cannot be accomplished in time to support continued operations. The most realistic near-term option for a limited number of the reactor operators (particularly those in countries with power reactor programs that have an infrastructure to accept the return of the radioactive waste generated during reprocessing) is to ship their spent nuclear fuel offsite for reprocessing.

The current practice followed in overseas reprocessing of research reactor spent fuel results in separated HEU that is placed back into commerce (some or all of it may be refabricated into new HEU research reactor fuel), a result that undermines United States' nuclear weapons nonproliferation goals. Furthermore, none of the foreign reprocessing facilities have the capability to reprocess the new, high density LEU fuel developed under the RERTR program. Thus, in the absence of action to resolve the question of the disposition of spent nuclear fuel, many foreign research reactor operators who could reprocess to control their spent fuel inventory would likely continue to use, or convert back to, fuel containing HEU. In such a case, the foreign research reactor operator community as a whole would have little incentive to convert their reactors to LEU fuels. This would have the effect of encouraging the foreign research reactor operators to use HEU (weapons-grade uranium) as fuel for their reactors, would increase the amount of HEU in international commerce, and would inevitably increase the opportunity for diversion of HEU into a nuclear weapons program.

DOE and the Department of State do not seek to indefinitely accept or otherwise manage spent nuclear fuel from foreign research reactors. Rather, the purpose of the new policy is to recover as much HEU that originated in the United States as possible from international commerce, while providing the foreign research reactor operators and their host countries time to convert the reactors to LEU fuel and to make their own arrangements for disposition of subsequently generated LEU spent nuclear fuel. The foreign research reactor operators and host countries must be prepared to implement their own arrangements for disposition of their spent nuclear fuel after the policy expires (i.e., after 10 years of spent fuel generation following the effective date of the policy).

IV. Alternatives Evaluated in the Final EIS

DOE evaluated the following alternatives for management of the foreign research reactor spent nuclear fuel:

A. Management Alternative 1: Accept and Manage Foreign Research Reactor Spent Nuclear Fuel in the United States

Under Management Alternative 1, foreign research reactor spent nuclear fuel containing uranium enriched in the United States would be transported to the United States in casks designed to comply with international regulations that are essentially identical to those promulgated by the U.S. Nuclear Regulatory Commission (NRC) and certified by the U.S. Department of Transportation. In accordance with the Record of Decision for the Programmatic SNF&INEL Final EIS, all of the aluminum-based foreign research reactor spent nuclear fuel accepted by DOE (about 18.2 MTHM) would be managed at the Savannah River Site in South Carolina, and the TRIGA elements (about 1 MTHM) would be managed at the Idaho National Engineering Laboratory, pending ultimate disposition.

The basic implementation elements of Management Alternative 1 provide the foundation for the analyses of impacts presented in the EIS. They are:

Policy Duration. The policy duration would be 10 years. Spent nuclear fuel that is currently being stored or that is generated during a 10 year policy period would be accepted. Actual shipments of spent nuclear fuel to the United States could be made for a period of 13 years, starting from the effective date of policy implementation. A five year policy duration and an indefinite duration for acceptance of HEU (with a ten year duration for LEU) were also analyzed as alternatives in the EIS.

Amount of Foreign Research Reactor Spent Nuclear Fuel. The amount of foreign research reactor spent nuclear fuel that would be accepted under the basic implementation of Management Alternative 1 is up to about 19.2 MTHM in up to approximately 22,700 individual spent nuclear fuel elements. These spent nuclear fuel elements would be received from 41 countries. Alternative amounts of spent nuclear fuel considered as implementation alternatives were: receipt of spent fuel only from countries that do not have high-income economies, acceptance of HEU spent fuel only, and acceptance of target material in addition to spent fuel.

Marine Transport. Under the basic implementation alternative, the spent fuel and target materials would be transported by sea in either chartered or regularly scheduled commercial ships. DOE estimates that 721 cask loads of foreign research reactor spent nuclear fuel (a cask load is one spent fuel shipping cask loaded with spent fuel) would be sent to the United States by ship over a 13-year acceptance period under Management Alternative 1. Acceptance of an additional 15 cask loads of target material by sea is also analyzed.

Potential Port(s) of Entry for Foreign Research Reactor Spent Nuclear Fuel. The following potential ports of entry were selected for analysis because they met basic criteria designed to identify the most appropriate ports for use in accepting foreign research reactor spent fuel:

Charleston, SC (includes Charleston Naval Weapons Station and Wando Terminal, Mt. Pleasant)
Concord Naval Weapons Station, CA
Galveston, TX
Hampton Roads, VA (includes Terminals at Newport News, Norfolk, and Portsmouth, VA)
Jacksonville, FL
Military Ocean Terminal Sunny Point, NC
Portland, OR
Savannah, GA
Tacoma, WA
Wilmington, NC

Ground Transport. The basic implementation of Management Alternative 1 would involve transporting casks containing foreign research reactor spent nuclear fuel by truck, rail, or barge from the ports of entry or Canadian border crossings to potential management sites.

Foreign Research Reactor Spent Nuclear Fuel Management Sites. The analysis considered five potential management sites selected to be consistent with the management sites evaluated in the Programmatic SNF&INEL EIS (i.e., the Savannah River Site in South Carolina, the Idaho National Engineering Laboratory, the Oak Ridge Reservation in Tennessee, the Hanford Site in Washington State, and the Nevada Test Site). The Record of Decision for the Programmatic SNF&INEL EIS subsequently eliminated

the last three sites from consideration as management sites for spent nuclear fuel from foreign research reactors.

Storage Technologies. During the first few years, storage would take place in existing storage facilities that use either wet or dry storage technologies. Under the basic implementation of Management Alternative 1, any new storage capacity that would be built would be dry storage. Wet storage was also evaluated as an alternative to dry storage.

Near-Term Conventional Chemical Separation in the United States. As an alternative to storage of the spent fuel in the United States, the Final EIS evaluated chemical separation of foreign research reactor spent nuclear fuel and target material in existing facilities at the Savannah River Site or the Idaho National Engineering Laboratory. The HEU could be blended down to LEU to preclude its use in nuclear weapons. The resulting high-level waste could be vitrified and managed onsite until a geologic repository becomes available.

Developmental Treatment and/or Packaging Technologies. As another alternative for management of the spent fuel, the Final EIS discussed a potential development program that DOE could conduct leading to a decision on whether to construct and operate a new treatment and/or packaging facility. The objective of this technical strategy would be to treat, package, and store spent nuclear fuel in a manner suitable for direct placement into a geologic repository without necessarily separating the fissile materials, while meeting or exceeding all applicable safety and environmental requirements.

Financing Arrangements. Under the basic implementation of Management Alternative 1, high-income-economy countries would be charged a competitive fee. The United States would bear the full cost of transporting and managing foreign research reactor spent nuclear fuel received from other countries. The Final EIS also evaluated alternatives in which:

1) All countries would be subsidized;

2) All countries would be charged a full-cost recovery fee; or

3) Countries with high income economies would be charged a full-cost recovery fee, while other countries would be subsidized.

Location for Taking Title. Under the basic implementation of Management Alternative 1, the United States would take title to spent nuclear fuel from foreign research reactors at the limit of United States territorial waters or continental border (for shipments from Canada). The Final EIS also evaluated alternatives in which the United States would take title prior to shipment, at the ports of entry, or at the DOE management sites.

Ultimate Disposition. The Nuclear Waste Policy Act of 1982 (as amended) authorizes disposal of the foreign research reactor spent nuclear fuel in a geologic repository. DOE is working with staff from the Nuclear Regulatory Commission to ensure that the spent fuel management actions it is undertaking for all of its spent fuel, and actions that would be undertaken for any additional foreign research reactor spent fuel to be accepted, will allow either direct emplacement of the spent fuel in a geologic repository or acceptance of the spent fuel in a treated form at a geologic repository.

Decisions regarding the actual disposal of DOE's spent nuclear fuel would follow appropriate environmental review under the National Environmental Policy Act.

B. Management Alternative 2: Facilitate the Management of Foreign Research Reactor Spent Nuclear Fuel Overseas

Under this Management Alternative, two subalternatives were analyzed. In the first subalternative, DOE and the Department of State would provide assistance, incentives, and coordination for spent fuel storage at one or more locations overseas, with appropriate storage technologies, regulations, and safeguards. In the second subalternative, DOE and the Department of State would provide nontechnical assistance, incentives, and coordination to foreign research reactor operators and reprocessors to facilitate reprocessing of spent nuclear fuel overseas in facilities operated under international inspections and safeguards. Facilities operated by the United Kingdom Atomic Energy Authority at Dounreay, United Kingdom, and by Cogema at Marcoule, France might be used for this purpose. After reprocessing, the recovered HEU would be blended down to LEU at these same facilities. The wastes resulting from this reprocessing would be sent to the country in which the spent nuclear fuel was irradiated. If the reprocessing wastes could not be sent to the country in which the spent nuclear fuel was irradiated, such wastes would be accepted by the United States for storage and ultimate geologic disposal. It is important to note that the foreign reprocessing facilities do not have the capability to reprocess the new, high density, LEU fuel developed under the RERTR program.

C. Management Alternative 3: A Combination of Elements from Management Alternatives 1 and 2 (Hybrid Alternative)

Under Management Alternative 3, DOE and the Department of State would combine elements from Management Alternatives 1 and 2 to develop new alternatives for management of foreign research reactor spent nuclear fuel in the United States or abroad. For example, DOE and the Department of State could combine partial storage or reprocessing overseas with partial storage or chemical separation in the United States. Implementation alternatives for the portion of the spent nuclear fuel from foreign research reactors to be managed in the United States would be the same as those for Management Alternative 1.

D. No Action Alternative

In the No Action Alternative, the United States would neither manage foreign research reactor spent nuclear fuel containing uranium enriched in the United States, nor provide technical assistance or financial incentives for overseas storage or reprocessing. In this case, there would be no foreign research reactor spent nuclear fuel shipments to the United States and no assistance to foreign countries for managing foreign research reactor spent nuclear fuel overseas.

E. Preferred Alternative

Under the Preferred Alternative (which is a combination of the implementation elements of Management Alternative 1), DOE would accept and manage in the United States up to 19.2 MTHM of foreign research reactor spent nuclear fuel in up to approximately 22,700 individual spent fuel elements and up to an additional 0.6 MTHM of target material. This spent fuel and target material would come from the following countries:

Table 1—High-income economy countries:

Australia
Austria
Belgium
Canada
Denmark
Finland
France
Germany
Israel
Italy
Japan
Netherlands
Spain
Sweden
Switzerland
Taiwan

United Kingdom

Table 2—Other Countries:

Argentina
Bangladesh
Brazil
Chile
Colombia
Greece
Indonesia
Iran
Jamaica
Malaysia
Mexico
Pakistan
Peru
Philippines
Portugal
Romania
Slovenia
South Africa
South Korea
Thailand
Turkey
Uruguay
Venezuela
Zaire

The types of Foreign Research Reactor Spent Nuclear Fuel and Target Material that would be accepted under the Preferred Alternative are as follows:

- Spent nuclear fuel (HEU and/or LEU) from research reactors operating on LEU fuel or in the process of converting to LEU fuel when the policy becomes effective.
- Spent nuclear fuel (HEU and/or LEU) from research reactors that operate on HEU fuel when the policy becomes effective but that agree to convert to LEU fuel. (Spent nuclear fuel would *not* be accepted from research reactors that could convert to LEU fuel but do not agree to do so.)
- Spent nuclear fuel (HEU) from research reactors having lifetime cores, from research reactors planning to shut down by a specific date while the policy is in effect, and from research reactors for which a suitable LEU fuel is not available.
- Spent nuclear fuel (HEU and/or LEU) from research reactors that are already shut down.
- Unirradiated fuel (HEU and/or LEU) from eligible research reactors would be accepted as spent nuclear fuel. (This material could be a particular nuclear weapons proliferation concern because it is not highly radioactive and thus can be handled manually. Thus could allow it to be stolen more easily.)

For research reactors with both HEU and LEU spent nuclear fuel available for shipment, LEU spent nuclear fuel would not be accepted until all HEU spent nuclear fuel has been accepted, unless there are extenuating circumstances (e.g., deterioration of one or more LEU elements sufficient to cause a health or safety problem if acceptance were delayed). Spent nuclear fuel (HEU and/ or LEU) would not be accepted from new research reactors starting operation after the date of implementation of the policy.

The duration of the policy under the Preferred Alternative would be 10 years. Shipments of spent nuclear fuel to the United States could be made for a period of up to 13 years, starting from the effective date of policy implementation, as long as the spent nuclear fuel had already been discharged prior to the beginning of the policy period or is discharged during the policy period. The additional three years in the shipping period were included to provide time for the radiation levels of the last spent fuel discharged during the 10 year policy period to decay enough to allow its transportation, to provide time for logistics in arranging for shipment of the last spent fuel discharged, and to allow for potential shipping delays.

The aluminum-based foreign research reactor spent nuclear fuel (about 18.2 MTHM) and target material (about 0.6 MTHM) would be transported to and managed at the Savannah River Site and the TRIGA foreign research reactor spent nuclear fuel (about 1 MTHM) would be transported to and managed at the Idaho National Engineering Laboratory, in accordance with the Records of Decision for the Programmatic SNF&INEL EIS and the settlement agreement reached between DOE and the State of Idaho [*Public Service Co. of Colorado* v. *Batt*, No. CV 91–0035–S-EJL (D. Id.) and *United States* v. *Batt*, No. CV–91–0054–S-EJL (D. Id.)]. According to this agreement, DOE could accept up to 61 TRIGA spent nuclear fuel shipments from foreign research reactors prior to December 31, 2000 for management at the Idaho National Engineering Laboratory. Before DOE would accept any shipments, the Governor of Idaho would be notified and the Secretary of Energy would certify that the shipments are necessary to meet national security and nonproliferation requirements.

The foreign research reactor spent nuclear fuel and target material would be shipped by either chartered or regularly scheduled commercial ships from the foreign ports to the United States.

Although all of the candidate ports listed in Management Alternative 1 above would be appropriate ports to use for receipt of the spent fuel and target material shipments, DOE would prefer to use the military ports in proximity to the spent nuclear fuel management sites (i.e., Charleston Naval Weapons Station and the Concord Naval Weapons Station) to take advantage of the characteristics of these ports to increase the safety and security of the spent fuel transportation process. (Note: Section VII of this notice designates these two ports as the ports of entry.)

DOE would take title to the foreign research reactor spent nuclear fuel and target material that is shipped by sea after it is unloaded from the ship at the port of entry, and to the spent nuclear fuel and target material shipped solely overland (i.e., from Canada) at the border crossing between Canada and the United States.

The foreign research reactor spent nuclear fuel and target material would be transported from the United States ports to the management sites by truck or rail.

The financing arrangement under the Preferred Alternative would be to charge high-income-economy countries a competitive fee and for the United States to bear the full cost associated with acceptance of spent fuel and target material from other countries. The fee policy for countries with high-income economies would be established in a **Federal Register** notice to allow DOE flexibility to adjust the fee policy to account for inflation, or further development of spent nuclear fuel management practices in the United States.

For the aluminum-based foreign research reactor spent nuclear fuel, the following three-point management strategy would be implemented:

1. New Technology Development/ Dry Storage. DOE would embark immediately on an accelerated program at the Savannah River Site to identify, develop, and demonstrate one or more non-reprocessing, cost-effective treatment and/or packaging technologies to prepare the foreign research reactor spent nuclear fuel for ultimate disposal. The purpose of any new facilities that might be constructed to implement these technologies would be to change the foreign research reactor spent nuclear fuel into a form that is suitable for geologic disposal, without necessarily separating the fissile materials, while meeting or exceeding all applicable safety and environmental requirements.

In conjunction with the examination of new technologies, variations of conventional direct disposal methods would also be explored. After treatment and/or packaging, the foreign research reactor spent nuclear fuel would be managed on site in ''road ready'' dry storage until transported off-site for continued storage or disposal. DOE

would select, develop, and implement, if possible, one or more of these treatment and/or packaging technologies by the year 2000. DOE is committed to avoiding indefinite storage of this spent nuclear fuel in a form that is unsuitable for disposal.

2. Potential Chemical Separation/Wet Storage. Despite DOE's best efforts, it is possible that a new treatment and/or packaging technology may not be ready for implementation by the year 2000. It may become necessary, therefore, for DOE to use the F-Canyon at the Savannah River Site to chemically separate some foreign research reactor spent nuclear fuel elements, while the F-Canyon is operating to stabilize at-risk materials in accordance with the Records of Decision (60 FR 65300, December 19, 1995 and 61 FR 6633, February 21, 1996) issued after completion of the Interim Management of Nuclear Materials Final Environmental Impact Statement (DOE/EIS–0220 of October 1995). Under current schedules, this chemical separation of foreign research reactor spent fuel could take place between the years 2000 and 2002. In that event, the foreign research reactor spent nuclear fuel would be converted into LEU and wastes. The high-level radioactive wastes would be vitrified in the Savannah River Site Defense Waste Processing Facility, while other wastes (all low level) would be solidified in the Savannah River Site Saltstone facility. In order to provide a sound policy basis for making a determination on whether and how to utilize the F-Canyon for chemical separation tasks that are not driven by health and safety considerations, DOE will commission or conduct an independent study of the nonproliferation and other (e.g., cost and timing) implications of chemical separation of spent nuclear fuel from foreign research reactors. The study will be initiated in mid-1996 and will be completed in a timely fashion to allow a subsequent decision about possible use of the F-Canyon for chemical separation of foreign research reactor spent nuclear fuel to be fully considered by the public, the Congress and Executive Branch agencies. Pending disposition of the foreign research reactor spent nuclear fuel by either a new treatment and/or packaging technology or chemical separation in the F-Canyon, the spent nuclear fuel would be placed in existing wet storage at the Savannah River Site.

3. Spent Nuclear Fuel Monitoring (Wet Storage). DOE would conduct a program of close monitoring of any foreign research reactor spent nuclear fuel and target material that would be accepted for storage in existing wet storage facilities. DOE is presently unaware of any technical basis for believing that this spent nuclear fuel cannot be safely stored until one or more of the treatment and/or packaging technologies becomes available. Nevertheless, if health and safety concerns involving any of the foreign research reactor spent nuclear fuel elements are identified prior to development of an appropriate treatment and/or packaging technology, DOE would use the F-Canyon to chemically separate the affected spent nuclear fuel elements, if it is still operating to stabilize at-risk materials.

Because the F-Canyon is only configured to handle LEU, under no circumstances would it be possible to produce separated HEU that is suitable for a nuclear weapon. Instead, depleted uranium would be added to the foreign research reactor spent nuclear fuel near the beginning of the chemical separations process, so that only LEU would be produced when the uranium is separated from the fission products. The trace quantities of plutonium in the spent nuclear fuel would be left in and solidified along with the high-level radioactive wastes. This would further the President's policy to discourage the accumulation of excess weapons-grade fissile materials, to strengthen controls and constraints on these materials and, over time, to reduce worldwide stocks.

The TRIGA foreign research reactor spent nuclear fuel would be stored at the Idaho National Engineering Laboratory in the Fluorinel Dissolution and Fuel Storage facility (wet storage) or preferably in the dry storage Irradiated Fuel Storage Facility and the CPP–749 dry storage area. After 2003, all foreign research reactor spent nuclear fuel at the Idaho National Engineering Laboratory would be managed in accordance with specific provisions of the settlement agreement between DOE and the State of Idaho, until transported off-site for ultimate disposition. Depending on the nature of any new treatment and/or packaging technology that might be developed, the TRIGA spent nuclear fuel would also be processed using such a new technology, if necessary for disposal.

V. Environmentally Preferable Alternatives

CEQ regulations (40 CFR 1505.2) require identification of the environmentally preferred alternative(s). The analysis of alternatives presented in the EIS indicates that the three Management Alternatives and the Preferred Alternative (a modification of subelements of Management Alternative 1) would have only small impacts on the human environment on or around the DOE management sites, the populations near the cask transportation routes, or the affected ports of entry. Using conservative assumptions (i.e., assumptions that tend to overestimate risks), the only measurable potential impacts from incident-free operations are associated with low radiation exposure to workers near the loaded transportation casks, particularly during transportation cask loading or unloading, or near the spent fuel during storage, and, to a much lesser degree, to the general population in and around the ports of entry and the transportation routes. These conservatively calculated impacts are extremely small, and are well within regulatory standards for health and safety.

Although the impacts would be small for each alternative considered, there are differences among the estimated impacts for the various alternatives. Besides the no-action alternative and overseas storage subalternative of Management Alternative 2, which would generate no direct environmental impact in the United States because they would result in no activity in the United States, the lowest impacts in the United States would be associated with implementing the proposed policy overseas under the overseas reprocessing subalternative of Management Alternative 2. In the overseas reprocessing subalternative, the foreign research reactor spent fuel would be reprocessed overseas and only the vitrified reprocessing wastes would be accepted in the United States. This alternative would have a very small environmental impact in the United States since only a small volume of waste in an inert, vitrified form would enter the United States. This would require only a small amount of transportation, handling, and storage in the United States and therefore would result in very little radiation exposure in the United States. Hence, Management Alternative 2 is the environmentally preferred alternative, next to the no action alternative. Both of the other alternatives, the hybrid alternative and the basic implementation of Management Alternative 1, would have relatively higher, but still extremely low, radiation exposure impacts because of the acceptance of a greater volume of material in the United States, resulting in more shipments and increased handling and storage requirements.

Among the Implementation Alternatives to Management Alternative 1 discussed in the Final EIS, accepting foreign research reactor spent fuel into the United States only from developing

nations (i.e., the ''Other Nations'' listed in Table 2 above) would present the lowest radiological risk in the United States. This is because this subalternative would deal with the least amount of spent fuel. The remaining subalternatives and implementation alternatives discussed in the EIS (including the acceptance of target material in addition to spent fuel, a policy duration of five years instead of ten years, use of wet storage, and chemical separation) do not measurably change the overall potential radiation exposure impact. The chemical separation subalternative would generate slightly higher accident and incident-free radiological exposure risk to the general population, but once again, this is a small variation within the overall small impacts from each of the alternatives.

Implementation of the Preferred Alternative would result in relatively higher, but still extremely low, environmental and health impacts because of the acceptance of the target material (in addition to the maximum amount of spent fuel), resulting in the maximum number of shipments and increased handling and storage requirements, and because of the potential chemical separation of a limited amount of spent fuel.

VI. Comments on the Final EIS

After issuing the Final EIS, DOE and the Department of State received approximately 35 letters commenting on the Preferred Alternative. These included letters from Governor Beasley of South Carolina, Senators Feinstein of California and Glenn of Ohio, Congressmen Baker and Miller of California, and Clyburn of South Carolina, California State officials, mayors and other local officials from the areas around the Charleston Naval Weapons Station and the Concord Naval Weapons Station, and several members of the public. Many of the comments covered issues previously addressed in the Final EIS, such as the following:

- Why is the new spent fuel and target material acceptance policy required?
- How were the preferred ports of entry chosen?
- Why are military ports preferred?
- Has DOE adequately considered the risks associated with shipments through the Concord Naval Shipyard due to its proximity to the highly populated San Francisco Bay area and the potential for seismic activity?
- What kinds of training and other assistance would be provided by DOE to prepare local jurisdictions to deal with the spent fuel shipments?

All of these issues are covered in the Final EIS, either in the body of the EIS or in the responses to comments submitted on the Draft EIS. In the interests of brevity, readers are requested to refer to the Final EIS for information on these issues. In addition, individual responses will be sent to each of the commentors.

The comments on the Final EIS also raised several new issues (i.e., issues not raised during public review of the Draft EIS), as follows:

A. Many commentors from the area around the Concord Naval Weapons Station were concerned that the cost of services required from local police or other city and county departments (e.g., services associated with emergency response, crowd control, etc.) to prepare for or respond to events associated with the spent fuel shipments would unfairly be left to the local communities to fund. The comments stated that DOE should provide funding to cover these additional expenses. To address this concern, DOE has replied that it is willing to enter into an appropriate agreement to reimburse local agencies or provide the incremental resources, either in kind or financial, that would be necessary to enable emergency response personnel to respond to an incident involving the proposed shipments of spent fuel, to provide for public safety in situations that are attributable to the shipment of spent fuel from foreign research reactors, and to allow a greater level of assurance of the protection of the health and safety of the public.

B. Several individuals commented that the Final EIS did not identify the specific local streets and roads over which the spent fuel shipments would travel and did not include site-specific analyses of the risk of the shipments through the ports of entry. DOE replied that the Final EIS does estimate the potential radiological and other health-related impacts (e.g., traffic accidents) of transporting the spent fuel through the ports of entry (see, for example, Volume 1, Table 4–7 in Section 4.2.2.3 of the Final EIS). However, the Final EIS did not address specific characteristics of local streets since local street, or rail, conditions could well change between the time the Final EIS was written and the time the shipments would be made. As a result, the actual route that would be taken for the overland transportation, whether by truck or rail, would be chosen closer to the time the transportation takes place. Selection of the actual route would be accomplished in consultation with the affected States, Tribes, local officials, and the carrier, and considering the conditions of the potential shipment routes at that time. Any route that is chosen would have to meet specific requirements imposed by the Department of Transportation, taking into account specific characteristics of local streets. Thus, when potential impacts are estimated, certain assumptions can be made about the transportation route, without knowing the actual route. Indeed, because the Final EIS analyses are conservative (i.e., they tend to overstate the transportation risks), changes in local conditions would be unlikely to result in changes in transportation risks that would exceed those analyzed in the Final EIS. The Final EIS contains enough information to accurately assess the foreseeable impacts so that the public and Government decision makers are adequately informed of potential consequences.

The same can be said about emergency services, personnel, emergency preparedness and facilities (i.e., specific circumstances may change between issuance of the Final EIS and the time an actual shipment would take place). For this reason, DOE is required to prepare a detailed Transportation Plan in cooperation with State, Tribal and local officials before a shipment is made. The Transportation Plan would specify details concerning how the shipments will be carried out and the routes to be used, planned shipment schedules, roles and responsibilities of emergency response personnel for jurisdictions along the transportation route, emergency plans and communications strategies. The Transportation Plan would also discuss any training to be carried out in preparation for the shipments, and would identify any equipment or other resources required to allow local responders and law enforcement personnel to be adequately prepared for the shipments. This procedure ensures that local officials would be well informed and prepared to handle any contingency before a shipment would be made.

C. One commentor questioned whether an alternate West Coast port would be required if scheduling conflicts occurred at the Concord Naval Weapons Station. DOE explained that this issue had been discussed with the Commander of the Naval Weapons Station and that he had informed DOE that they currently have about 20% slack time available, and that this should be more than adequate to accommodate 5 shipments over 13 years.

D. Recently, new information has come to light regarding the ability of the F and H Canyons (chemical separations

facilities used at the Savannah River Site) to withstand a severe earthquake. One commentor requested that DOE delay issuance of the Record of Decision on the proposed acceptance policy until completion of an on-going detailed safety analysis of the facilities. The commentor noted that the Preferred Alternative in the Final EIS would allow chemical separation under certain circumstances, and that chemical separation followed by vitrification of the high-level radioactive wastes remains the one proven means of stabilizing spent fuel and preparing it for ultimate disposition.

In response, DOE explained that, until the on-going analysis is complete, it will not be known with certainty whether the new information will result in a significant change in the range of potential impacts of chemical separation described in the Final EIS. Analysis to date, however, provides reasonable assurance that completion of the seismic analysis will soon demonstrate that chemical separation in the F and H Canyons remains a viable alternative for management of spent fuel. DOE had not contemplated chemical separation of foreign research reactor spent fuel, if at all, until approximately the year 2000, and the Canyons will not be used if the seismic analysis indicates that they pose an unacceptable risk. Chemical separation however, may never need to be pursued because the Preferred Alternative provides for an aggressive new program to develop and implement new treatment and/or packaging technologies to prepare the spent fuel for ultimate disposition without the use of the F and H Canyons. In light of these factors, and in order to encourage the research reactor operators not to withdraw from the Reduced Enrichment for Research and Test Reactors program (and resume or continue using HEU fuels), DOE and the Department of State believe it is necessary to issue the Record of Decision now, rather than awaiting completion of the seismic analysis. Because research reactors are the major users of HEU in civil programs, it is essential that they support the Reduced Enrichment for Research and Test Reactors program if the United States is to achieve the goal of eventually eliminating the use of HEU in civil commerce, thereby reducing the threat of nuclear weapons proliferation worldwide.

DOE further notes that the Final EIS discusses the potential impacts of chemical separation as merely one means of managing the foreign research reactor spent fuel. Under the Preferred Alternative, chemical separation would be considered only after completion of a study of the impacts of chemical separation on United States nuclear weapons nonproliferation policy, and then only if DOE is not ready to implement a new technology to prepare the spent fuel for ultimate disposition in approximately the year 2000 (see Section IV.E.). Even if both chemical separation and a new technology were not available in the year 2000, the Final EIS fully analyzes the potential impacts of storing the spent fuel in wet and dry storage facilities for up to 40 years, so that the full range of reasonable alternative management options is covered in the Final EIS. Therefore, the decision of whether to accept foreign research reactor spent fuel into the United States does not depend on the availability of chemical separation as a management option.

E. Several commentors objected to the fact that DOE spent Government funds to print and mail the Final EIS (or its Summary) to members of the public. DOE explained that the regulations implementing the National Environmental Policy Act require agencies to provide a copy of a Final EIS to any individual who submits ''substantive'' comment on the draft of that EIS. DOE limited the cost of printing and mailing to the greatest extent possible by mailing only the Summary of the Final EIS to commentors from locations other than Augusta, Georgia, and the States of California, Idaho, and South Carolina who had not specifically requested a copy of the full Final EIS (all individuals and organizations who were sent only a Summary were offered an opportunity to receive the entire Final EIS).

VII. Decision

DOE, in consultation with the Department of State, has decided to implement a new foreign research reactor spent fuel acceptance policy, as specified in the Preferred Alternative in the Final EIS, subject to the additional stipulations noted below. In summary, implementation of the new foreign research reactor spent fuel acceptance policy will involve acceptance of aluminum-based spent fuel, TRIGA spent fuel, and target material containing uranium enriched in the United States, as defined in the Final EIS. This material will be accepted from the 41 countries listed in Section III of this notice. The spent fuel acceptance will involve approximately 19.2 MTHM (metric tonnes of heavy metal) of foreign research reactor spent fuel in up to 22,700 separate spent fuel elements and approximately 0.6 MTHM of target material. This amount of material is the amount that is currently in storage at the foreign research reactors, plus that which DOE estimates will be discharged over the next ten years. Shipments of this spent fuel into the United States will be accepted over a 13 year period, beginning on the effective date of the policy. The foreign research reactor spent nuclear fuel will be shipped by either chartered or regularly scheduled commercial ships. The majority of the spent fuel will be received from abroad through the Charleston Naval Weapons Station in South Carolina (about 80%) and the Concord Naval Weapons Station in California (about 5%). Most of the target material and some of the spent fuel (about 15%) will be received overland from Canada. Shipment through Charleston will begin in the summer of 1996 and through Concord in mid-1997. Shipments from Canada have not been scheduled at this time. After a limited period of interim storage, the spent fuel will be treated and packaged at the Savannah River Site and the Idaho National Engineering Laboratory as necessary to prepare it for transportation to a final disposal repository.

DOE will apply the following additional stipulations to implementation of the new spent fuel acceptance policy:

A. DOE will reduce the number of shipments necessary by coordinating shipments from several reactors at a time (i.e., by placing multiple casks [up to eight] on a ship). DOE currently estimates that a maximum of approximately 150 to 300 shipments through the Charleston Naval Weapons Station and five shipments through the Concord Naval Weapons Station will be necessary during the 13 year spent fuel acceptance period.

B. Target material containing uranium enriched in the United States will be accepted only if a reactor operator wishing to ship target material formally commits to convert to the use of LEU targets, when such targets become available (a program to develop LEU targets is underway as an adjunct to the RERTR program). To demonstrate this commitment, DOE will require that the affected reactor operators enter into an agreement with DOE that sets forth the milestones and schedule for the conversion. Reactor operators currently operating on HEU fuel will be required to enter into a similar agreement regarding conversion of their reactors to operate on LEU fuel.

C. The Final EIS demonstrates that the spent fuel and target material could be safely transported overland within the United States by either truck or rail, and DOE has decided that either

transportation mode may be used. However, based on input from the public in the vicinity of the ports of entry, there appears to be a strong preference for the use of rail. Therefore, DOE will seek to use rail for shipments from the ports of entry to DOE facilities at the Savannah River Site in South Carolina and the Idaho National Engineering Laboratory in Idaho, pending further discussions with the States, Tribes and local jurisdictions along the proposed transportation routes.

D. During the period starting with initial implementation of the new spent fuel acceptance policy through approximately the end of 1999, the Department will aggressively pursue one or more new technologies that would put the foreign research reactor spent fuel in a form or container that is eligible for direct disposal in a geologic repository.

Should a new treatment or packaging technology not be ready for implementation by the year 2000, DOE has under active consideration chemical separation of some of the foreign research reactor spent fuel in the F-Canyon at the Savannah River Site, where it would be blended down to LEU and potentially placed under International Atomic Energy Agency safeguards. The Department intends to conduct a study that will look in more depth at the issues associated with a decision to chemically separate this spent fuel. Issues to be considered include minimizing any potential proliferation risks, cost and timing. The State of South Carolina will be invited to participate in the study.

A subsequent Record of Decision will be issued at approximately the end of 1999 (or sooner if possible) to announce DOE's future management plans for the foreign research reactor spent fuel and target material based on the results of the Department's program to develop the new treatment and/or packaging technologies by that time (including any necessary environmental reviews), and the study discussed above.

Staff from the Nuclear Regulatory Commission have agreed to undertake an independent review of any new technology, or application of existing technologies, that DOE proposes to develop, to provide a high degree of confidence that implementation of such a technology would produce a product that will be acceptable for disposal in a geologic repository.

VIII. Use of All Practicable Means To Avoid or Minimize Harm

Implementation of this decision will result in low environmental and health impacts. However, DOE will take the following steps to avoid or minimize harm wherever possible:

A. DOE will use current safety and health programs and practices to reduce impacts by maintaining worker radiation exposure as low as reasonably achievable and by meeting appropriate waste minimization and pollution prevention objectives.

B. DOE will require that the shipping contractors implement a system to keep records of which ships are used to transport foreign research reactor spent fuel and target materials and which ship crew members, port workers and land transportation workers are involved in the shipments. DOE will include a clause in the contract for shipment of the spent fuel and target material requiring that other ship crew members, port workers and land transportation workers be used if any worker in these categories could approach a 100 mrem dose in any year (the regulatory limit set in 10 CFR Part 20 for radiation exposure to a member of the general public).

C. DOE will reduce the risk associated with shipment of the spent fuel by shipping multiple casks per shipment, up to a maximum of eight, whenever possible, thus reducing the total number of shipments.

D. DOE will implement a process of detailed transportation planning, involving States, Tribes and local jurisdictions through which the shipments will pass, to ensure that all organizations that would respond to an accident involving a foreign research reactor spent fuel shipment will be fully prepared and informed prior to any shipment taking place.

E. DOE will conduct the program to identify and develop an improved means of treating and/or packaging the foreign research reactor spent fuel with the intent of providing a technology to be used to prepare the spent fuel for geologic disposal that has less environmental impacts than the technologies that are currently available.

Items A, C, D, and E above will be accomplished under existing business practices in the normal course of implementing the new spent fuel acceptance policy. For item B, DOE will prepare a Mitigation Action Plan under the provisions of DOE's NEPA implementation procedures (10 CFR 1021.331).

IX. Basis for the Decision

The elements of the decision discussed in Section VI above (i.e., the Preferred Alternative with additional stipulations) have been selected based on the following considerations:

A. Management Alternative.

The various management alternatives considered are discussed in Section 2 of the Final EIS. The analyses in Section 4 of the Final EIS demonstrate that the impacts on the environment, involved workers, and the citizens of the United States from implementation of any of the management alternatives or implementation alternatives analyzed (other than beneficial impacts associated with support for United States nuclear weapons nonproliferation policy) would be small and within applicable regulatory limits, and would not provide a basis for discrimination among the alternatives. As a result, the process for selection of the elements of the action to be taken focused on programmatic considerations:

1. DOE, in consultation with the Department of State, concluded that the No Action Alternative and Management Alternative 2, Implementation Alternative 1a (Overseas Storage) would be unacceptable since these alternatives are not consistent with United States nuclear weapons nonproliferation policy objectives.

2. DOE, in consultation with the Department of State, also believes that Management Alternative 2, Implementation Alternative 1b (Overseas Reprocessing) would not provide an incentive for reactor operators to switch to LEU fuel or continue using LEU fuel. Since there is no overseas reprocessing capability for the new, high density LEU fuel developed by the RERTR program, foreign research reactor operators would have to continue using HEU fuel in order to be able to rely on reprocessing as a spent fuel management approach. In addition, reprocessing could result in the continued production of HEU, which could then be made available in civil commerce. Furthermore, the two countries that provide reprocessing require that the resulting wastes be returned to the countries of origin. Many of the countries in which the foreign research reactors are located do not have the technical or regulatory infrastructure to manage these wastes. Finally, the United States would not be able to impose conditions on the reactor operators or reprocessing firms to assure that its nuclear weapons nonproliferation objectives would be met.

3. The sample hybrid alternative (Management Alternative 3) analyzed in the Draft EIS involved partial reprocessing overseas coupled with partial management in the United States. Even though the use of overseas reprocessing would be more limited in

this alternative, many of the concerns raised above with regard to reprocessing would apply. Because of these concerns and uncertainties, DOE and the Department of State do not believe it would be prudent to rely on the use of overseas reprocessing to meet United States' nuclear weapons nonproliferation objectives.

DOE, in consultation with the Department of State, has concluded that a modification of the basic implementation of Management Alternative 1 as specified in the Preferred Alternative balances policy, technical, cost and schedule requirements, and provides the strongest support for United States' nuclear weapons nonproliferation policy objectives because all aspects of the alternative will be under the control of DOE, either directly or through the spent nuclear fuel acceptance contracts with the reactor operators.

B. Management Technology

The alternative spent nuclear fuel management technologies considered are discussed in Sections 2.2.2.7 and 2.6.5 of the Final EIS. The approaches fall into four broad categories, as follows:

Wet Storage. Wet storage is a proven technology, that has been used for decades to safely store research reactor spent fuel from both domestic and foreign reactors. The impacts of continued use of wet storage would be small, and completely within applicable regulatory limits. Furthermore, DOE currently has wet storage facilities in operation at the Savannah River Site and the Idaho National Engineering Laboratory that can be used for storage of foreign research reactor spent nuclear fuel. The water chemistry of the wet storage pools is carefully controlled to minimize the possibility of degradation and allow continued safe operation of the pools.

Dry Storage. Dry storage is also a proven technology that would also have no more than small impacts, completely within applicable regulatory limits. It is the storage medium that is being selected at all commercial power reactor sites where additional storage capacity is being built. Dry storage capacity could be provided at the management sites in time to meet the program's projected needs, if initial spent nuclear fuel receipts were placed into the available wet storage.

Chemical Separation. Chemical separation is also a proven technology, the impacts of which would be small, and completely within applicable regulatory limits. However, DOE is phasing out its chemical separation activities and is currently conducting chemical separations only at the Savannah River Site to stabilize materials for health and safety reasons. Because these chemical separations facilities could be used to treat the foreign research reactor spent nuclear fuel, they provide a contingency to be considered pending availability of an alternate means of treating and/or packaging the spent nuclear fuel prior to ultimate disposition.

New Technologies. In order to prepare the spent fuel for ultimate disposition, some form of treatment and/or packaging may be required. Several promising new technologies, as well as variations of existing technologies, have been proposed and are under evaluation. Relatively simple technologies appear to be feasible, although they require more development work to confirm their viability and the cost of their implementation. This development will take place before DOE makes a decision on implementation of any of the new technologies.

In order to effectively accept and manage the foreign research reactor spent nuclear fuel in the United States, DOE, in consultation with the Department of State, developed the three point strategy for management of aluminum-based spent nuclear fuel discussed in the description of the Preferred Alternative (see Section IV.E.). This strategy draws on the strengths of each of the spent nuclear fuel management technologies discussed above, while avoiding sole reliance on any of them. Due to the relatively more robust nature of the TRIGA spent nuclear fuel, DOE believes that minimal additional development may be needed to prepare it for storage and final disposition. Accordingly, the decision specified in this Record of Decision is to place the TRIGA spent nuclear fuel in existing dry storage facilities at the Idaho National Engineering Laboratory. However, the analysis to determine what treatment, if any, will be necessary to qualify the TRIGA spent fuel for geologic disposal will continue and the appropriate treatment, if any, will be identified and implemented.

DOE will issue a second, separate Record of Decision at approximately the end of 1999 (or sooner if possible) to provide assurance to the States hosting the DOE spent fuel management sites that DOE will place sufficient priority on the new technology development effort, and to ensure that the decision on which spent fuel management approach to adopt for use past the year 2000 receives appropriate scrutiny by Executive Branch agencies, Congress and the public.

C. Duration of the Policy

The alternatives for the duration of the policy that were considered are discussed in Sections 2.2.2.1 and 2.2.2.2 of the Final EIS. In analyzing these alternatives, DOE concluded that the 5-year option is unlikely to provide sufficient time for the reactor operators to arrange for alternative spent nuclear fuel disposal mechanisms, and thus might result in some reactor operators refusing to participate in the program to convert or continue to use LEU fuel. That would substantially undermine the goal of eliminating civil commerce in HEU.

On the other hand, the analysis determined that there was insufficient benefit to be gained from extending acceptance of all foreign research reactor spent fuel containing HEU into the indefinite future because such an approach would be unlikely to provide sufficient incentive for other countries to proceed expeditiously with development of alternative arrangements for disposal not involving the United States.

The approach selected provides the incentive needed to gain the reactor operators' cooperation, while specifying a definite cut-off point. This alternative provides sufficient lead time to allow the reactor operators to make other arrangements for disposition of their spent nuclear fuel, and provides sufficient time to accept all spent nuclear fuel containing HEU enriched in the United States.

D. Amount of Material to Manage

The alternative amounts of material that might be covered by the proposed policy are described in Sections 2.2.1.3 and 2.2.2.1 of the Final EIS. DOE, in consultation with the Department of State, concluded that management of spent nuclear fuel only from countries that do not have high income economies would strongly encourage the resurgence of the use of HEU in the high-income economy countries, as well as opening the United States, fairly or unfairly, to charges that it was not living up to commitments under the Treaty on the Non-Proliferation of Nuclear Weapons. Management of only spent nuclear fuel containing HEU would penalize those reactors that have already converted to the use of LEU fuel, and would provide an incentive for reactors to continue to use HEU fuel, or switch back to its use.

DOE, in consultation with the Department of State, concluded that management of all of the aluminum-

based and TRIGA foreign research reactor spent nuclear fuel currently in storage or projected to be discharged during the policy period, and target material containing uranium enriched in the United States, will provide the best support for United States' nuclear weapons nonproliferation policy. Implementation of this approach will provide an opportunity for removal of all United States origin HEU from civil commerce and will provide an incentive for the continued conversion to and use of LEU as fuel for foreign research reactors, in place of HEU.

DOE added the stipulation specifying that target material will be accepted only from foreign research reactors whose operators who formally agree to switch to use of LEU targets, when such targets become available, to provide an additional incentive for the reactor operators to make the switch to LEU targets.

E. Marine Transport

The alternative approaches to marine transport of foreign research reactor spent nuclear fuel are discussed in Section 2.2.1.5 of the Final EIS. The analyses in the Final EIS demonstrate that the impacts to the environment, workers, or the public from transport of the spent nuclear fuel using any of these types of ships would be small, and within applicable regulatory limits. The analyses do not identify any difference in the small impacts that would result from the use of purpose-built vs. general purpose ships. In addition, ''military transports'' are in fact the same type of ship as chartered commercial cargo ships and are crewed by civilians, use of ''military transports'' would not actually result in any difference in impacts. DOE, after consultation with the Department of State, believes that use of actual warships would be unnecessary from a security standpoint.

The approach selected by DOE, after consultation with the Department of State, (use of chartered or commercial ships) provides maximum flexibility for marine transport.

DOE has decided to specify the additional stipulation on reduction of the number of shipments as a means of responding to public concerns regarding the risk of the shipments and to reduce shipping costs.

F. Ground Transport

The ground transportation alternatives (i.e., truck, rail and barge) are discussed in Section 2.2.1.7 of the Final EIS. The analyses in the Final EIS demonstrate that the impacts to the environment, workers, or the public, from any of these modes of ground transport (counting barge as a mode of ''ground transport'') would be small and within the applicable regulatory limits. Furthermore, the differences in potential impacts between the truck, rail and barge alternatives were not significant.

Both the truck and rail transportation options have been used successfully to transport foreign research reactor spent nuclear fuel in the past. Truck transport was the predominant mode used for over twenty years, until the old ''Off-Site Fuels Policy'' lapsed in 1988. Rail was the mode used for both shipments under the Environmental Assessment of Urgent-Relief Acceptance of Foreign Research Reactor Spent Nuclear Fuel. Since neither of the ports of entry (see item H below) can reasonably provide barge transport to either of the management sites, barge transport was not included in the preferred alternative.

The Final EIS demonstrates that the spent fuel and target material could be safely transported overland within the United States by either truck or rail, and DOE has decided that either transportation mode may be used. However, there appears to be a strong preference by some members of the public in the port areas for the use of rail. Therefore, in response to this preference, DOE has decided that it will seek to use rail for shipments from the ports of entry to DOE facilities at the Savannah River Site in South Carolina and the Idaho National Engineering Laboratory in Idaho as a general matter, subject to further discussions with the States, Tribes and local jurisdictions along the proposed transportation routes.

G. Title Transfer Location

The alternative points at which DOE might take title to the spent nuclear fuel and target material are discussed in Sections 2.2.1.4 and 2.2.2.4 of the Final EIS.

The point at which title will be transferred has no effect on the physical processes that would take place, and thus will not have any effect on the impacts on the environment, workers, or the public. The Price-Anderson Act would provide liability protection in the unlikely event of a nuclear accident in the United States, whether or not DOE has taken title to the spent nuclear fuel at the time of such an accident. As a result, DOE, after consultation with the Department of State, concluded that the selection of the title transfer location could be made solely on programmatic considerations.

Acceptance of title at the foreign research reactor sites could make the United States Government liable for any accident that might occur in the country of origin, or on the high seas. DOE has been unable to identify any advantage to the United States of taking title outside the United States. Taking title at the limit of United States territorial waters would make the title transfer depend solely on when the ship enters United States waters, which could be difficult for DOE to control in certain circumstances (e.g., during a storm). Acceptance of title when the foreign research reactor spent nuclear fuel actually enters the land mass of the United States (the approach selected) provides the most certainty for implementation. The approach selected ensures that liability for accidents during the transportation process outside the United States will remain with the reactor operators, while reinforcing in the minds of the public that the United States Government will be accountable in the unlikely event of an accident within United States territory.

H. Ports of Entry

The alternative ports of entry considered are discussed in Sections 2.2.1.6 and 3.2 of the Final EIS. The analyses in the EIS demonstrate that the impacts on either the environment, workers, or the public due to use of any of the potential ports of entry analyzed would be small and within applicable regulatory limits.

Although any one or all of the ten ports of entry described in the Final EIS would be acceptable ports of entry, DOE, in consultation with the Department of State, concluded that foreign research reactor spent nuclear fuel marine shipments to the United States should be made via the military ports (selected from among those analyzed in the Final EIS and found acceptable) in closest proximity to the spent nuclear fuel management sites (i.e., the Charleston Naval Weapons Station and the Concord Naval Weapons Station). DOE will seek to transport multiple casks per ship to keep the total number of shipments as small as possible, as well as to reduce risks and costs.

Use of military ports will provide additional confidence in the safety of the shipments due to the increased security associated with the military ports. This could also require much of the spent nuclear fuel to be shipped via chartered ships because commercial ships do not schedule stops at military ports. Use of chartered ships will increase the cost of shipping spent nuclear fuel. This additional cost will be borne by the reactor operators for

shipments from high-income economy countries, and by the United States for reactor operators from other countries. The additional cost will be kept to a minimum by shipping as many casks as possible on each ship (up to a maximum of eight per ship).

I. Management Sites

The question of which sites should be used for management of all of DOE's spent nuclear fuel was addressed in the Programmatic SNF&INEL Final EIS, including consideration of the potential receipt of the foreign research reactor spent nuclear fuel. The initial Record of Decision for the Programmatic SNF&INEL Final EIS (60 FR 28680, June 1, 1995), specifies that any aluminum-based foreign research reactor spent nuclear fuel accepted in the United States will be managed at the Savannah River Site; and that the remaining foreign research reactor spent nuclear fuel will be managed at the Idaho National Engineering Laboratory. This decision was not affected by the second Record of Decision for the Programmatic SNF&INEL Final EIS (61 FR 9441, March 8, 1996). The site for management of the target material was left to be decided under the Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (i.e., the Final EIS). All of the target material currently in DOE's possession is managed at the Savannah River Site. The approach selected (i.e., management of target material at the Savannah River Site) is not inconsistent with the decision specified in the Records of Decision for the Programmatic SNF&INEL Final EIS.

The analyses in the Final EIS demonstrate that the impacts to either the environment or the public through use of any of the sites for management of the foreign research reactor spent nuclear fuel and target material would be small, and well within applicable regulatory limits.

J. Financing Arrangement

The alternative financing arrangements are discussed in Sections 2.2.1.2 and 2.2.2.3 of the Final EIS. The financing arrangement selected will have no effect on the physical processes that will take place, and thus will not have any direct environmental effects. However, it could affect how many foreign research reactor operators elect to ship spent nuclear fuel to the United States. For instance, if DOE and the Department of State were to charge a full cost recovery fee to all reactors, some of the reactors in high-income countries and many, if not all, of the reactors in other countries would not have the financial resources to participate. This would reduce the amount of spent fuel to be accepted and also reduce the potential environmental impacts that would be associated with shipment and management of the spent fuel, but would result in an increased risk of diversion of highly enriched uranium into a foreign nuclear weapons program. On the other hand, if the United States subsidized all of the reactors, the United States would bear the full financial burden, even for reactors that can afford to pay their fair share.

DOE, in consultation with the Department of State, concluded that, to encourage that reactor operators in countries with other-than-high-income-economies to participate in the program, the United States should subsidize receipt of their spent nuclear fuel. DOE and the Department of State also concluded that DOE should strive to recover as much of the cost of managing the spent nuclear fuel as possible from high-income economy countries. DOE concluded that it will announce the fee policy in a **Federal Register** notice (separate from this **Federal Register** notice announcing the Record of Decision), so that the fee policy may be changed from time to time as necessary to reflect changes in cost or new information that may be relevant to the policy.

Such an approach will recover as much as possible of the United States' expenses for management of spent nuclear fuel from high-income economy countries (without encouraging any of them to resort to reprocessing of their spent nuclear fuel), will encourage participation by other countries, and will provide a mechanism through which to account for changes in cost and future definition of program details.

X. Conclusion

DOE, in consultation with the Department of State, has decided to implement a new foreign research reactor spent fuel and target material acceptance policy, as specified in the Preferred Alternative contained in the Final EIS, subject to the additional stipulations noted in Section VII and including the mitigation activities identified in Section VIII. This new policy is effective upon being made public, in accordance with DOE's NEPA implementation regulations (10 CFR § 1021.315). The goals of this policy are to support the United States' nuclear weapons nonproliferation policy calling for the reduction, and eventual elimination, of HEU from civil commerce, and to encourage foreign research reactors to switch from HEU fuels to alternative LEU fuels developed under the RERTR program. In reaching this decision, DOE has considered the concerns expressed by the Department of State, the Nuclear Regulatory Commission, the Arms Control and Disarmament Agency, the National Security Council, and the International Atomic Energy Agency concerning the need for such a policy. A critical result of implementing this policy will be the continued viability and vitality of the RERTR program because foreign research reactor operators will have a continued incentive to participate. Similarly, implementation of programs similar to the RERTR program in Russia, the other newly-independent states of the former Soviet Union, China, South Africa, and other countries, and the establishment of a world-wide norm discouraging the use of HEU depends on a commitment by the United States to action such as that embodied in the new foreign research reactor spent fuel and target material acceptance policy. At the same time, the impacts on the environment, workers, and the public from implementing the acceptance program are estimated to be small and well within applicable regulatory limits.

The decision process reflected in this Notice complies with the requirements of the National Environmental Policy Act (42 U.S.C. 4321 et seq.) and its implementing regulations at 40 CFR Parts 1500–1508 and 10 CFR Part 1021.

Issued in Washington, D.C., this 13th day of May, 1996.

Hazel R. O'Leary,

Secretary of Energy.

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