
DEPARTMENT OF ENERGY

Notice of Intent

AGENCY: Department of Energy.

ACTION: Notice of Intent.

SUMMARY: The Department of Energy (DOE) announces its intent to prepare an Environmental Impact Statement (EIS) on the management of a portion of the aluminum-clad spent nuclear fuel {1} at the Savannah River Site. The Department's objective is to identify and implement appropriate actions to safely and efficiently manage all aluminum-clad spent nuclear fuel and targets assigned to the Savannah River Site, including placing these materials in forms suitable for disposition. To this end, this EIS will cover that portion of the aluminum-clad spent nuclear fuel inventory currently in storage at the Savannah River Site, as well as aluminum-clad foreign, domestic and government research reactor aluminum-clad spent nuclear fuel that has been assigned to, but has not yet been received at the Savannah River Site. Approximately 188 metric tons of spent nuclear fuel and targets currently stored at the SRS are not considered within the scope of this EIS because the Department has already decided on the management strategy for these materials. The spent nuclear fuel included in this EIS consists of approximately 62 metric tons heavy metal of spent nuclear fuel: 34 metric tons currently at the Savannah River Site and 28 metric tons, foreign and domestic, to be shipped to the Savannah River Site. This Notice of Intent briefly describes the proposed DOE action and

alternatives, announces the schedule for the public scoping meeting, and solicits public involvement.

{1} Aluminum-clad spent nuclear fuel is nuclear reactor fuel that has been withdrawn from a reactor following irradiation, the constituent elements of which have not been separated. The ``spent nuclear fuel'' consists primarily of the fuel (usually enriched uranium), fission products, and the aluminum structural material that serves as cladding. For the purposes of the SRS Spent Nuclear Fuel Management EIS, spent nuclear fuel also includes uranium/neptunium target materials, blanket subassemblies, pieces of fuel, and debris.

DATES: DOE invites comments on the proposed scope of the SRS Spent Nuclear Fuel Management EIS from the public. Comments must be postmarked or submitted by fax or electronic mail by March 3, 1997 to ensure consideration in the preparation of the draft EIS. DOE will consider late comments to the extent practicable. DOE will conduct an informational workshop and public scoping meeting on January 30, 1997, from 1:00 p.m. to 4:00 p.m. and 6:00 p.m. to 9:00 p.m., at the North Augusta Community Center, 101 Brookside Drive, North Augusta, South Carolina. The purpose of the workshop and scoping meeting is to discuss spent nuclear fuel management issues at the SRS and provide an opportunity for the public to assist the Department in determining the appropriate scope of the EIS. The date, time and location of the workshop and scoping meeting that appear in this Notice will be announced in the SRS Environmental Bulletin and local newspapers well

in advance of the meeting.

ADDRESSES: Questions and comments concerning the SRS Spent Nuclear Fuel Management EIS and comments on the scope of the EIS can be submitted in writing to Andrew R. Grainger, NEPA Compliance Officer, Savannah River Operations Office, P.O. Box 5031, Aiken, South Carolina 29804-5031. Internet addresses are drew.grainger@srs.gov or nepa@barms036.b-r.com. Questions and comments may also be submitted by telephone or fax to the toll-free telephone number 1-800-242-8269.

For general information on the DOE NEPA process, contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Assistance, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585; telephone (202) 586-4600 or leave a message at (800) 472-2756.

SUPPLEMENTARY INFORMATION:

Purpose and Need for Action

DOE needs to safely and efficiently manage all aluminum-clad spent nuclear fuel and targets assigned to the SRS until ultimate disposition. The management alternatives could involve the use of existing, modified, or new facilities or processes, consistent with DOE policies regarding the protection of the environment, public and worker safety and health, nonproliferation, and recent DOE decisions regarding the

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programmatic management of spent nuclear fuel and the decision to accept and manage in the United States foreign research reactor spent nuclear fuel containing uranium enriched in the United States.

Spent Nuclear Fuel Currently Stored at the SRS

The current SRS inventory of spent nuclear fuel consists of approximately 222 metric tons {2} heavy metal (MTHM, which is the uranium mass, excluding cladding, alloy materials and structural materials). The inventory includes various forms, as follows: (a) SRS spent production reactor fuels consisting of aluminum-clad highly enriched uranium; (b) aluminum-clad targets or slugs containing plutonium or other isotopes; (c) aluminum-clad spent nuclear fuels from offsite domestic and foreign research reactors; and (d) offsite research and test reactor spent nuclear fuels clad in zirconium, stainless steel, or other materials. The SRS spent production reactor fuels, targets and slugs are currently stored under water in the K-, and L-Reactor disassembly basins, while the offsite domestic and foreign research reactor spent nuclear fuel is stored under water in the Receiving Basin for Offsite Fuels. Foreign research reactor spent nuclear fuel is also scheduled to be stored in the L-Reactor disassembly basin.

{2} A metric ton is 1,000 kilograms, equal to about 2,200 pounds.

The spent nuclear fuel and targets that are the subject of the SRS Spent Nuclear Fuel Management EIS will be: that portion of the spent nuclear fuel and targets (34 metric tons) currently stored at the SRS that has been determined to be stable, but whose management pending ultimate disposition has not yet been determined under an environmental impact statement prepared under the National Environmental Policy Act; and approximately 28 metric tons heavy metal of spent nuclear fuel consisting of the foreign research reactor spent nuclear fuel that will be shipped to SRS over the next 13 years, and the DOE and domestic research reactor spent nuclear fuel that will be shipped to SRS for the foreseeable future (i.e., until at least the year 2035).

The proposed action and alternatives considered in this EIS would be consistent with recent Departmental decisions regarding the programmatic management of spent nuclear fuel (Record of Decision, Spent Nuclear Fuel and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programmatic Environmental Impact Statement, 60 FR 28680 (June 1, 1995), and Amendment of Record of Decision, 61 FR 9441 (March 8, 1996), and Departmental decisions to accept and manage foreign research reactor spent nuclear fuel in the United States (Record of Decision, Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, 61 FR 25092, May 17, 1996).

Approximately 188 metric tons of spent nuclear fuel and targets currently stored at the SRS are not considered within the scope of this EIS because the Department has already decided on the management strategy for these materials. These materials were evaluated in the Interim Management of Nuclear Materials (IMNM) EIS (DOE/EIS-0220,

October 1995). In that EIS, DOE considered alternatives for stabilizing spent nuclear fuel and other radioactive materials stored at the SRS that DOE determined could not be safely stored over the next decade in their present condition. Following completion of the IMNM EIS, DOE decided (60 FR 65300, December 19, 1995) to stabilize the Mark-31 targets, 81 failed Taiwan Research Reactor elements, and a failed Experimental Breeder Reactor II element (totaling about 159 MTHM) by dissolving them in the F-Canyon facility and by reducing the plutonium component to metal in the FB-Line facility, after which the resulting materials would be stored. Subsequently, DOE announced its decision (61 FR 6633, February 21, 1996) to stabilize Mark-16 and Mark-22 production reactor spent fuels by processing them and blending down the highly enriched uranium component to low enriched uranium in SRS facilities. Other aluminum-clad targets stored in the reactor basins would be stabilized by dissolving them in the canyon facilities and storing the solutions in the SRS high-level waste tanks for eventual conversion to a glass form in the Defense Waste Processing Facility. The glass logs would then be stored at the SRS until ultimate disposition. While these materials are considered spent fuel, their management is not considered within the scope of the SRS Spent Nuclear Fuel Management EIS because, once stabilized, they will be suitable for disposition under existing DOE programs. Accordingly, no other management alternatives need be considered.

The management and disposition of the 62 MTHM {3} are the subject of this EIS. Table 1 provides information on the spent nuclear fuel inventory currently located at the SRS that the Department plans to evaluate in this EIS.

{3} The 34 MTHM currently stored at SRS do not include about 22 MTHM spent fuel clad in stainless steel or zirconium and stored in the Receiving Basin for Offsite Fuels. This material will be shipped to the Idaho National Engineering Laboratory for management there (60 FR 28680, June 1, 1995).

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Table 1.-- Existing SRS Inventory of Aluminum-Clad SNF (as of September 30, 1996) to be Evaluated in EIS

Fuel type	Location	Number of items	Units	Metric tons heavy metal
Fuels:				
Mark-14	RBOF {1}	1	Can {2}	<0.001
Taiwan Research Reactor	RBOF	62	Cans	8.7
Experimental Breeder Reactor	RBOF	59	Cans	16.7
Sodium Experimental Reactor	RBOF	36	Cans	2.1
Argonne National Laboratory Janus Reactor	RBOF	19	Assemblies {3}	0.003
Advanced Thermal Source Reactor	RBOF	21	Assemblies	0.003
Massachusetts Institute of Technology Reactor	RBOF	56	Assemblies	0.016
University of Missouri Research Reactor	RBOF	112	Assemblies	0.049
Rhode Island Nuclear Center Reactor	RBOF	70	Assemblies	0.004

University of Michigan Reactor.	RBOF	48	Assemblies.....	0.034
University of Virginia Reactor.	RBOF	44	Assemblies.....	6.062
Nereide (French) Research Reactor.	RBOF	46	Assemblies.....	0.035
Japanese Material Test Reactor.	RBOF	71	Assemblies.....	0.017
French Hot Flux Research Reactor.	RBOF	4	Assemblies.....	0.026
Oak Ridge Research Reactor	RBOF	165	Assemblies.....	0.111
Sterling Forest.....	RBOF	678	Cans.....	0.094
		200	Assemblies.....	0.028
Urgent Relief Receipts....	RBOF	252	Assemblies.....	0.05
Targets:				
Mark-42 targets.....	RBOF	7	Assemblies.....	<0.1
Mark-18 americium-241 targets.	RBOF	65	targets {4}.....	<0.1
Special curium and other targets.	RBOF	114	slugs {5}.....	<0.1
Total.....	.....	.....	.....	About 34 MTHM

{1} The Receiving Basin for Offsite Fuels facility at the SRS.

{2} The term ``can'' indicates that the spent nuclear fuel was placed in an aluminum can, which was then sealed to provide a suitable storage container for the fuel element(s).

{3} The term ``assembly'' refers to the nuclear fuel in its assembled form (i.e., fuel, cladding and handling features are all present). In this case, the term ``assembly'' is synonymous with ``fuel element.''

{4} The term ``target'' refers to uranium or transuranic material, clad in aluminum, that was irradiated in a reactor for the purpose of producing special isotopes, e.g., plutonium-238.

{5} The term ``slug'' normally refers to a disassembled target.

Foreign Research Reactor Fuel Assigned to the SRS. Following completion of the EIS on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, DOE and the Department of State decided to implement a new foreign research

reactor spent nuclear fuel policy by accepting from foreign reactors spent nuclear fuel containing uranium enriched in the United States (Record of Decision, 61 FR 25092. May 17, 1996). Implementation of this policy will result in the acceptance of up to 22,700 foreign research reactor spent fuel elements (about 19.2 MTHM) by the United States. Of this number, about 17,800 are aluminum-clad fuel elements (about 18.2 MTHM) which have been assigned to the Savannah River Site for management. The remaining foreign research reactor spent fuel elements (about 1 MTHM) have been assigned to the Idaho National Engineering Laboratory for management.

In the Record of Decision (61 FR 25092, May 17, 1996) for the EIS on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, DOE decided to implement a three-point strategy for managing these fuel elements. First, DOE has started an accelerated program to identify, develop, and demonstrate one or more non-processing, cost-effective treatment or packaging technologies to prepare the foreign research reactor spent nuclear fuel for disposition. 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. Examples of such treatment technologies could include: press and dilute/poison, melt and dilute/poison, plasma arc treatment, electrometallurgical treatment, glass materials oxidation and dissolution, dissolve and vitrify, direct disposal in small packages, and direct co-disposal with high-level waste.

In conjunction with the examination of new technologies, variations of conventional direct disposal methods would also be explored. After treatment or packaging, the foreign research reactor spent nuclear fuel

treatment or packaging, the foreign research reactor spent nuclear fuel would be managed on site in dry storage. (After such treatment or packaging, the spent nuclear fuel would then be in a condition often referred to as ``road ready,'' meaning that no further packaging or treatment would be required before being transported off-site for continued storage or disposal.) DOE would select, develop, and implement, if appropriate, one or more of these treatment 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.

Should a new treatment or packaging technology not be ready for implementation by the year 2000, the second part of the strategy would involve use of F-Canyon to chemically separate some foreign research reactor spent nuclear fuel elements while the F-Canyon facility is operating in order to stabilize ``at-risk'' materials (i.e., materials that pose a health or safety concern) in accordance with the Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 94-1. DOE would use the F-Canyon to process only that quantity of foreign research reactor fuel that could be accommodated by the available canyon capacity. Current schedules show that this activity could take place after the year 2000. As part

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of the assessment and analysis of this contingency, DOE committed to commission or conduct an independent study of the nonproliferation and other implications of processing spent nuclear fuel from foreign

research reactors. The results of this study will be applicable to all the spent nuclear fuel within the scope of the SRS Spent Nuclear Fuel Management EIS and will be incorporated into a final decision on spent nuclear fuel management at SRS.

The third part of the strategy for managing foreign research reactor spent nuclear fuel is embodied in a program of closely monitoring such fuel placed in wet storage at the SRS. DOE is presently unaware of any technical basis for believing that the foreign research reactor spent nuclear fuel cannot be safely stored until one or more of the new packaging or treatment technologies becomes available. Nevertheless, if health and safety concerns involving any of the foreign research reactor spent fuel materials are identified prior to development of an appropriate treatment or packaging technology, DOE would use the F-Canyon to process the affected spent nuclear fuel materials, while F-Canyon is operating to stabilize the at-risk materials.

DOE and Domestic Research Reactor Fuel to be Shipped to SRS. Following completion of the Programmatic Spent Nuclear Fuel and Idaho National Engineering Laboratory Environmental Restoration and Waste Management EIS, DOE decided that the SRS will be the management site of aluminum-clad fuel that is currently in or may become a part of DOE's inventory (DOE reactor fuel, excluding spent fuel at the Hanford site, university and other domestic research test reactor fuel, and fuel from foreign research reactors) (Record of Decision, 60 FR 28680, June 1, 1996) and Amendment to the Record of Decision, 61 FR 9441, March 8, 1996). This decision will result in the shipment of about 4,500 aluminum-clad spent fuel elements to the SRS from the Idaho National Engineering Laboratory and up to 9,600 aluminum-clad spent fuel elements from domestic DOE and research reactors (for a total of about

10 MTHM). Table 2 provides information on the expected future receipts of spent nuclear fuel at the SRS that the Department plans to evaluate in this EIS.

Table 2.--Expected Future Receipts of Spent Nuclear Fuel at the Savannah River Site

Source	Number of elements	MTHM
Domestic Research Reactors	9,600	6.2
Foreign Research Reactors	17,800	18.2
Idaho National Engineering Laboratory	4,500	3.8
Total	About 31,900 elements	About 28.2 MTHM

Alternatives:

DOE will evaluate several alternatives for the management of both the aluminum-clad spent nuclear fuel currently stored at the Savannah River Site and the foreign and domestic research reactor spent nuclear fuel that is expected to be shipped to the Savannah River Site in the future. Each of the following alternatives will be considered for the spent nuclear fuel currently in storage and that is expected to be shipped to the SRS.

Continued Wet Storage (No Action)

The no action alternative would continue storage of spent fuel in the Receiving Basin for Offsite Fuel and the L-Reactor disassembly basin. Future receipts of domestic and foreign fuel would be stored at these locations. This alternative also involves continuation of the

enhanced monitoring program and water chemistry management activities at the basins to ensure the safe storage of spent fuel. Under this alternative, DOE would also use the F-Canyon (or H-Canyon) facility to process those fuel elements that are determined to present health and safety vulnerabilities during wet storage, in accordance with the Records of Decision for the Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel EIS (61 FR 25092, May 17, 1996) and the Interim Management of Nuclear Material EIS (60 FR 65300 and 61 FR 6633, December 19, 1995 and February 21, 1996 respectively). Because each alternative evaluated in this EIS involves some period of wet storage prior to implementation, the potential for processing fuels which are determined to present health and safety vulnerabilities is applicable to all the alternatives. DOE notes that processing for health and safety reasons is already authorized under existing analyses.

New Processing/Packaging Technologies

This alternative would include evaluating one or more cost-effective treatment or packaging technologies as described in the Record of Decision (61 FR 25092, May 17, 1996) for the Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel EIS. Most of these technologies would employ packaging or processing activities that would not separate fissile material from fission products. In the SRS Spent Nuclear Fuel Management EIS, DOE will evaluate the potential impacts of the application of these technologies to the spent nuclear fuel that is the subject of this EIS for the purpose of placing these materials in forms

suitable for geologic disposal.

Dry Storage

This alternative assesses the potential impacts associated with the construction and operation of a facility (Transfer and Storage Facility) to receive, characterize, condition, package, and dry store SNF prior to shipment to a geologic repository for disposal. DOE would evaluate dry storage for managing existing stable spent nuclear fuel inventories as well as future receipts.

Conventional Processing

This alternative would involve processing spent nuclear fuel in the existing chemical separation facilities. For foreign research reactor spent fuel, this alternative would be applicable only to address health and safety concerns, as described above. For stable non-foreign research reactor SNF, DOE would evaluate the potential environmental impacts associated with processing, even where not required for health or safety concerns. This alternative could result in the separation of some fissile materials (generally, highly enriched uranium) from the spent nuclear fuel, which would be blended down to low-enriched uranium prior to removing the material from the processing facility complex. Low-enriched uranium is not weapons-grade nuclear material. Some amount of plutonium-239 would also be separated.

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However, there would be no plutonium-239 separated from the vast majority of the fuel, even in instances where plutonium-239 may be present. Plutonium-239 separation would only occur in cases where it was required in order to ensure criticality safety in high-level waste tanks and the subsequent high-level waste vitrification process. In any case, no effort would be made to maintain the purity of the plutonium-239. DOE would process the plutonium to metal for storage in accordance with the DOE standard for storage of plutonium prior to the application of International Atomic Energy Agency (IAEA) safeguards. Any separated plutonium-239 would be placed under IAEA control when such controls are instituted.

Identification of Environmental and Other Issues

DOE has identified the following issues for analysis in the EIS. Additional issues may be identified during the scoping process, and DOE specifically solicits comments on the appropriateness of these issues for consideration in the EIS.

1. Public and worker safety: radiological and nonradiological impacts of the alternatives, including potential effects on workers and the public from the normal operation and accident conditions.

2. Impacts to plants, animals, and habitat, including impacts to wetlands, and threatened and endangered species and their habitat.

3. The consumption of natural resources and energy including water, natural gas, and electricity.

4. Socioeconomic impacts to affected communities from the operations labor force and any required construction labor force, and

support services, in the SRS region of influence.

5. Potential disproportionately high or adverse human health or environmental impacts on minority and low-income populations.

6. Transportation of spent nuclear fuel to the Savannah River Site.

DOE believes that these impacts are adequately addressed in other environmental impact statements and intends to incorporate the analysis by reference into this EIS.

7. Impacts on cultural resources, historic, archaeological, scientific, or culturally important sites.

8. Status of compliance with all applicable Federal, state, and local statutes and regulation; required Federal and state environmental consultations and notifications; and DOE orders on waste management, waste minimization initiatives, and environmental protection.

9. Potential impact on U.S. nonproliferation policy, especially as the actions considered may produce weapons usable fissile materials that may need to be safeguarded.

10. Cumulative impacts from the proposed action and other past, present, and reasonably foreseeable actions at the Savannah River Site.

11. Potential irreversible and irretrievable commitments of resources.

Related Documents

The following documents, which are available for review at DOE Reading Rooms, contain information related to the issues to be addressed in the SRS Spent Nuclear Fuel EIS.

U.S. Department of Energy. 1995. Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory

Environmental Restoration and Waste Management Programs Final Environmental Impact Statement, DOE/EIS-0203F. Idaho Operations Office, Idaho Falls, ID, April 1996.

U.S. Department of Energy. 1996. Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, DOE/EIS-0218F. Assistant Secretary for Environmental Management, Washington, D.C. February 1996.

U.S. Department of Energy. 1995. Final Environmental Impact Statement, Interim Management of Nuclear Materials, DOE/EIS-0220. Savannah River Operations Office, Aiken, South Carolina. October 1995.

U.S. Department of Energy. 1995. Facility Utilization Strategy for the Savannah River Site Chemical Separations Facilities. Savannah River Operations Office, Aiken, South Carolina. December 1995.

U.S. Department of Energy. 1994. Environmental Assessment of Urgent-Relief Acceptance of Foreign Research Reactor Spent Nuclear Fuel, DOE/EA-0912. Washington, D.C. April 1994.

Issued in Washington, D.C., this 23rd day of December 1996.

Peter N. Brush,

Principal Deputy Assistant Secretary, Environment, Safety and Health.

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