6450-01-P

DEPARTMENT OF ENERGY

Environmental Assessment for the Acceptance and Disposition of Spent Nuclear Fuel Containing U.S.-Origin Highly Enriched Uranium from the Federal Republic of Germany

AGENCY: Department of Energy.

ACTION: Notice of availability; public meeting.

SUMMARY: The U.S. Department of Energy (DOE) announces the availability of its draft environmental assessment (EA) (DOE/EA-1977) evaluating the potential environmental impacts from a proposed action to receive, store, process and disposition spent nuclear fuel (SNF) from the Federal Republic of Germany at DOE's Savannah River Site (SRS) (Draft German Spent Nuclear Fuel EA).[1] This SNF is composed of kernels containing thorium and U.S.-origin highly enriched uranium (HEU) embedded in small graphite spheres that were irradiated in research reactors used for experimental and/or demonstration purposes. DOE invites public comments on the Draft Spent Nuclear Fuel from Germany EA and is announcing a public meeting.

DATES: The 45-day public comment period extends from the date of publication of this notice in the Federal Register through March 11, 2016. DOE will consider all comments received via email by 11:59PM Eastern Standard Time or postmarked by that date. Comments submitted after that date and time will be considered to the extent practicable.

DOE will hold a public meeting to receive comments on the Draft Spent Nuclear Fuel from Germany EA. The meeting will be held on:

• February 4, 2016, (7:00 p.m. to 9:00 p.m.) at the North Augusta Community Center, 495 Brookside Drive, North Augusta, South Carolina 29841.

[1] This environmental assessment was announced as the *Environmental Assessment for the Acceptance and Disposition of Used Nuclear Fuel Containing U.S.-Origin Highly Enriched Uranium from the Federal Republic of Germany* in DOE's Notice of Intent (NOI) on June 4, 2014 (79 FR 32256). The title has been changed.

ADDRESSES: This Draft Spent Nuclear Fuel from Germany EA is available at the following sites:

http://energy.gov/nepa/office-nepa-policy-and-compliance

http://www.srs.gov/sro/germanheuproj.html

http://www.srs.gov/general/pubs/envbul/nepa1.htm

To request a print copy of the Draft Spent Nuclear Fuel from Germany EA please submit your request to Tracy Williams, NEPA Compliance Officer, U.S. Department of Energy, P.O. Box B, Aiken, South Carolina 29802; or by telephone at (803) 952-8278.

DOE invites Federal agencies, state and local governments, Native American tribes, industry, other organizations, and members of the general public to submit comments on DOE's Draft Spent Nuclear Fuel from Germany EA. Please direct written comments on the Draft Spent Nuclear Fuel from Germany EA to Tracy Williams, NEPA Compliance Officer, U.S. Department of Energy, P.O. Box B, Aiken, South Carolina 29802.

Comments on the Draft Spent Nuclear Fuel from Germany EA may also be submitted by email to *GermanSpentNuclearFuelEA@leidos.com* . DOE will give equal weight to written comments and oral comments received at the public meeting. Requests to be placed on the German Spent Nuclear Fuel EA mailing list should be directed to Tracy Williams at the postal or email addresses above.

FOR FURTHER INFORMATION CONTACT: To request further information on SRS spent nuclear fuel disposition activities or background information on the proposed project, please contact Tracy Williams at the address as listed above.

For general information concerning DOE's NEPA process, contact: Ms. Carol Borgstrom, Director, Office of NEPA Policy and Compliance (GG-54), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585: (202) 586-4600, or leave a message toll-free, at (800) 472-2756; fax (202) 586-7031; or send an email to *AskNEPA@hq.doe.gov*.

This Draft Spent Nuclear Fuel from Germany EA is available on the DOE NEPA Web site at *http://nepa.energy.gov*, and also at the SRS website at http://www.srs.gov/general/pubs/envbul/nepa1.htm**.**

SUPPLEMENTARY INFORMATION:

Background

DOE has prepared the Draft Spent Nuclear Fuel from Germany EA in accordance with Council on Environmental Quality and DOE National Environmental Policy Act (NEPA) implementing regulations at 40 CFR parts 1500 through 1508 and 10 CFR part 1021, respectively. The Draft Spent Nuclear Fuel from Germany EA analyzes the potential environmental impacts of receipt, storage, processing, and disposition of SNF from Germany containing, prior to irradiation, approximately 900 kilograms (kg) of U.S.-origin HEU. The SNF is composed of kernels containing thorium and U.S.-origin HEU embedded in small graphite spheres.

The United States provided the HEU to Germany between 1965 and 1988. The spent fuel was irradiated at the Arbeitsgemeinschaft Versuchsreaktor (AVR) reactor, which operated from 1967 to 1988, and the Thorium High Temperature Reactor (THTR)-300, which operated from 1983 to 1989. These reactors operated as part of Germany's research and development program for pebble bed, high-temperature, gas-cooled reactor technology.

In a February 2012 letter, the State Secretary of the Federal Ministry of Education and Research of the Federal Republic of Germany requested DOE's Under Secretary for Nuclear Security to consider accepting the SNF, and collaboration on the request was initiated in May 2012. In April 2014, DOE, the Federal Ministry of Education and Research of the Federal Republic of Germany, and the Ministry for Innovation, Science and Research of the State of North Rhine-Westphalia on behalf of the North Rhine-Westphalian State Government, Germany, signed a Statement of Intent[2] to cooperate in conducting the preparatory work necessary to support DOE's consideration of the request that it accept the spent fuel from Germany and to use SRS facilities for processing and disposition of the spent fuel. The preparatory work includes conducting studies, technical and engineering work, as well as preparation of this Draft Spent Nuclear Fuel from Germany EA. The Draft Spent Nuclear Fuel from Germany EA and the engineering work

[2] The referenced Statement of Intent is provided in the Draft EA as Appendix A.

will allow DOE to reach an informed decision on the proposed receipt, acceptance, processing and disposition of the spent nuclear fuel from Germany. The Statement of Intent specifies that Forschungszentrum Julich, an interdisciplinary research center funded primarily by the German government, is bearing the cost of the preparatory phase – feasibility studies and NEPA analysis – and if there is a decision to proceed with the project, would also bear the costs associated with acceptance, processing, and disposition of the spent nuclear fuel.

Purpose and Need for Action

DOE's purpose and need for the receipt, storage, processing, and disposition of the SNF from Germany is to support the U.S. policy objective to reduce, and eventually to eliminate, HEU from civil commerce. This action would further the U.S. HEU minimization objective by returning U.S.-origin HEU from Germany to the United States for safe storage and disposition in a form no longer usable for an improvised nuclear device, a radiological dispersal device, or other radiological exposure device.

Proposed Action and Alternatives

In the Draft Spent Nuclear Fuel from Germany EA, DOE considers a No Action Alternative as required under NEPA, and two action alternatives for acceptance and disposition of the graphite-based SNF currently stored in Germany. Under the No Action Alternative, the SNF would not be transported to the United States for management and disposition.

The two action alternatives differ in processing technology and location at SRS where the processing would occur. Under both of the proposed action alternatives, the SNF would be transported from Germany and processed at SRS for final disposition as a proliferation-resistant waste form. The proposed action alternatives are identified by the respective SRS processing location. The H-Area Alternative (so named because most activities would involve H-Area facilities) includes three processing options (Vitrification Option, Low-Enriched Uranium Waste Option, and Low-Enriched Uranium/Thorium Waste Option) that use H-Canyon to differing extents; the L-Area Alternative (so named because the alternative would involve mostly L-Area facilities) would implement melt and dilute processing in L-Area. Existing and planned SRS infrastructure and facilities would be used to process the spent nuclear fuel from Germany.

The shipping campaign from Germany would involve about 30 shipments over approximately a 3.5-year period to transport 455 CASTOR[3] casks containing the SNF from Germany aboard chartered ships across the Atlantic Ocean to Joint Base Charleston-Weapons Station near Charleston, South Carolina. From Joint Base Charleston-Weapons Station, the CASTOR casks would be transported to SRS on dedicated trains.

Processing steps would involve separating the HEU kernels from their graphite matrix, then processing the kernels through either H-Canyon and the SRS Liquid Nuclear Waste Facilities, or through a new melt and dilute process that would be installed in L-Area. The HEU kernels are embedded in a graphite (carbon) matrix which must be removed for the HEU kernels to be processed. Two methods for removing the graphite surrounding the fuel kernels (referred to as carbon digestion), a molten salt digestion process and a vapor digestion process, are evaluated in this EA.

H-Area Alternative

Under the H-Area alternative, three options for dissolving the kernels after carbon digestion are evaluated:

- The vitrification option provides for dissolution of the kernels in H-Canyon with direct transfer of the entire dissolver solution to the existing Liquid Nuclear Waste Facilities. Under this option, the high-activity fraction of the dissolver solution would be dispositioned as vitrified high-level radioactive waste and the low-activity fraction as low-level radioactive waste saltstone.
- The low-enriched uranium waste option provides for dissolution of the kernels in H-Canyon followed by solvent extraction in H-Canyon to separate the uranium. The resulting uranium solution would be down blended and grouted (i.e., solidified by mixing with cement) to meet acceptance criteria for disposal as low-level radioactive waste. The remainder of the dissolver solution would be processed through the Liquid Nuclear Waste Facilities into high- and low-level radioactive waste as indicated for the vitrification option.

[3] CASTOR is the name given to a dry-storage cask for storage and transport of radioactive material.

- The low-enriched uranium/thorium waste option provides for dissolution of the kernels in H-Canyon followed by solvent extraction in H-Canyon for separation of the uranium and thorium. The resulting uranium/thorium solution would be down blended and grouted to meet acceptance criteria for disposal as low-level radioactive waste. The remainder of the dissolver solution would be processed through the Liquid Nuclear Waste Facilities into high- and low-level radioactive waste as indicated for the vitrification option.

L-Area Alternative

Under the L-Area Alternative, the kernels would be down-blended and converted to a uranium-aluminum alloy in a melt and dilute process in L-Area. The resulting ingots would be stored in concrete overpacks on a pad in L-Area. Unlike the H-Area processing methods, the kernels would not be dissolved prior to final processing.

NEPA Process

All comments on the Draft Spent Nuclear Fuel from Germany EA received during the public comment period will be considered and addressed in the Final Spent Nuclear Fuel from Germany EA. DOE will address comments submitted after the close of the public comment period on the Draft EA to the extent practicable. Following the public comment period, and based on the EA and consideration of all comments received, DOE will either issue a Finding of No Significant Impact (FONSI) or announce its intent to prepare an environmental impact statement (EIS). If DOE determines that a FONSI is appropriate, both the Final EA and FONSI will be made available to the public.

If DOE determines that an EIS is needed, either during preparation of the Final Spent Nuclear Fuel from Germany EA or after completing the EA, DOE would issue in the Federal Register a Notice to prepare an EIS. In that case, the June 2014 public comment process would serve as the scoping process that normally would follow a Notice of Intent to prepare an EIS.

Issued in Washington, D.C. on January 15, 2016.

Edgardo DeLeon
Director, Office of Nuclear Materials Disposition.
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