

DEPARTMENT OF ENERGY

Environmental Impact Statement for the Proposed Production of Plutonium-238 for Use in Advanced Radioisotope Power Systems for Future Space Missions

AGENCY: Department of Energy (DOE).

ACTION: Notice of Intent.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA), DOE announces its intent to prepare an environmental impact statement (EIS) for the proposed production of plutonium-238 (Pu-238) using one or more DOE research reactors and facilities. The Pu-238 would be used in advanced radioisotope power systems for potential future space missions. Without a long-term supply of Pu-238, DOE would not be able to provide the radioisotope power systems that may be required for these potential future space missions, and the Department would not fulfill the intended space nuclear power role assigned to the Department in the National Space Policy statement issued on September 19, 1996. This assigned role of maintaining the space nuclear capability is also consistent with the Department's charter under the Atomic Energy Act of 1954, as amended. The Department's space nuclear power role has been recognized for over 35 years in annual appropriations to the Department and its predecessor agencies. This EIS will analyze the potential environmental impacts of establishing a domestic capability to produce Pu-238 including the storage of neptunium-237 (Np-237), fabrication of Np-237 targets, irradiation of targets to produce Pu-238, and the processing of these targets to isolate the Pu-238 and recycle the Np-237. Alternatives to be analyzed for the fabrication of Np-237 targets and for processing the irradiated targets include the use of the Radiochemical Engineering Development Center in Oak Ridge, Tennessee, and the Fuels and Materials Examination Facility at the Hanford Site near Richland, Washington. Alternative facilities for the irradiation of targets for Pu-238 production include the Advanced Test Reactor near Idaho Falls, Idaho, the Fast Flux Test Facility at the Hanford Site, Washington, and the High Flux Isotope Reactor in Oak Ridge, Tennessee. The "No Action" alternative would assess the impacts of not establishing a domestic production source for Pu-238 while preserving the option to purchase Pu-238 from Russia. In addition, a second "No Action" alternative will evaluate the need for preserving Np-237 for potential future

use even if a near-term domestic production capability is not established. The option to purchase Pu-238 from Russia would still remain a viable alternative to domestic Pu-238 production.

DOE invites individuals, organizations, and agencies to submit oral and/or written comments regarding the scope of the EIS, including the environmental issues and alternatives that the EIS should analyze.

DATES: The public scoping period begins with the publication of this Notice in the **Federal Register** (FR) and will continue until November 4, 1998. Written comments postmarked or submitted by fax or electronic mail by that date will be considered in preparation of the EIS. Later comments will be considered to the extent practicable.

DOE will conduct public scoping meetings to assist in defining the appropriate scope of the EIS including the significant environmental issues to be addressed. DOE plans to hold scoping meetings in the vicinity of the proposed alternative sites under consideration (i.e., Oak Ridge National Laboratory, Idaho National Engineering and Environmental Laboratory, and Hanford sites). The date, time, and location will be announced through the local media as soon as determined but at least 15 days prior to the date of the meetings.

ADDRESSES: Please direct comments or suggestions on the scope of the EIS, requests to speak at the public scoping meetings, requests for special arrangements to enable participation at scoping meetings (e.g., interpreter for the hearing impaired), and questions concerning the project to: Colette Brown, Office of Nuclear Energy, Science and Technology (NE-50), U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874, Telephone: 301-903-6924, Facsimile: 301-903-1510, Electronic Mail: Colette.Brown@HQ.DOE.GOV.

FOR FURTHER INFORMATION CONTACT: To request information about this EIS, or to be placed on the EIS document distribution list, please call the 24-hour toll-free information line at 1-800-708-2680. For general information about the DOE NEPA process, please contact: Carol Borgstrom, Director, Office of NEPA Policy and Assistance (EH-42), U.S. Department of Energy, 1000 Independence Ave. S.W., Washington, D.C. 20585-0119, Telephone: 202-586-4600 or leave a message at 1-800-472-2756.

SUPPLEMENTARY INFORMATION:

Background

Under the Atomic Energy Act of 1954, as amended, DOE and its predecessor agencies have been developing radioisotope power systems (RPS) and Radioisotope Heater Units (RHUs) and supplying them to the National Aeronautics and Space Administration (NASA) for more than 30 years. The radioisotope used in these systems is Pu-238. These systems have repeatedly demonstrated their value as enabling technologies in various NASA missions. DOE has projected that, over the next 20 to 25 years, NASA will continue to conduct missions that will require or would be enabled or enhanced by RPS fueled with Pu-238.

Under the National Space Policy issued by the Office of Science and Technology Policy in September 1996, and in accordance with its nuclear charter under the Atomic Energy Act of 1954, as amended, DOE has responsibility to assure that it maintains the capability to provide the nuclear infrastructure, including the Pu-238, needed to support these missions. The Intersector Guidelines section of the National Space Policy states that "The Department of Energy will maintain the necessary capability to support space missions which may require the use of space nuclear power systems." Historically, the reactors and chemical processing facilities at DOE's Savannah River Site (SRS) have been used to produce Pu-238 by the irradiation of targets containing Np-237. The irradiated targets were moved from the reactor site to a chemical processing facility where the targets were processed and the Pu-238 was recovered as an oxide powder. The remaining Np-237 was recovered for recycle into additional targets. The Pu-238 oxide powder was then shipped to facilities for producing pellets that were in turn shipped to another DOE site to make the RPS unit. As a result of the downsizing of the DOE nuclear weapons complex due to end of the Cold War, the reactors used to produce Pu-238 at SRS have been shut down. The radiochemical processing facilities at SRS are also planned to be shut down in the near future after existing supplies of radioactive materials no longer needed to support DOE's missions have been processed into a form suitable for long-term storage or disposal.

In 1992, DOE signed a contract to purchase Pu-238 from Russia allowing the U.S. to purchase up to 40 kilograms (kgs) of Pu-238. Under this contract, DOE purchased 9 kgs of Pu-238, and in 1997, extended the contract for another five years. This option, therefore,

continues to be viable. However, it is unclear whether this option will continue to be reliable or viable once the existing contract has expired. The political and economic climate in Russia creates uncertainties about the reliability of this source of Pu-238 to satisfy potential future NASA space mission requirements. Therefore, DOE proposes to reestablish a reliable domestic capability for producing Pu-238 to satisfy these foreseeable space mission requirements. Since the facilities previously used at SRS are no longer available for the production of Pu-238, DOE needs to evaluate other existing DOE reactors and chemical processing facilities for target irradiation and separation of Pu-238. The environmental impacts of purchasing Pu-238 from Russia have already been evaluated and are documented in the Environmental Assessment of the Import of Russian Plutonium-238 (DOE/EA-0841, June 1993) prepared by DOE's Office of Nuclear Energy, Science and Technology.

Purpose and Need for the Agency Action

In accordance with its responsibilities under the National Space Policy issued in September 1996 and consistent with its charter under the Atomic Energy Act of 1954, as amended, DOE is proposing to establish a reliable domestic supply source for Pu-238 to meet the radioisotope-fueled power requirements for future space missions. A near-term decision is needed for two primary reasons. First, the existing inventory of Pu-238 which is available for space missions (approximately 9 kgs, primarily material purchased from Russia) will be exhausted by about 2004. Though additional firm missions cannot be specified at this time, over a planning horizon of the next 20 to 25 years, some future space missions will require Pu-238-fueled RPS. A Pu-238 production rate of 2–5 kgs/year would be sufficient to meet these projected long-term user requirements. Second, the production of Pu-238 begins with the irradiation of Np-237 targets. The United States' only inventory of Np-237 is currently being stored at SRS in an aqueous nitrate solution and will require processing to an oxide form prior to fabrication into targets for irradiation. The environmental impact of converting this material to an oxide form has been addressed in DOE's Office of Environmental Management EIS on the Interim Management of Nuclear Materials at the Savannah River Site (DOE/EIS-0220, October 1995). Unless the Np-237 is used in the production of Pu-238, the Department

will establish plans for the future disposition of this material.

Alternatives to be Evaluated

The EIS will analyze a range of reasonable alternatives for the proposed production and processing of 2–5 kgs per year of Pu-238. "Production" includes the irradiation of Np-237 targets in reactor(s); "processing" includes a Np-237 storage capability and a target fabrication and processing capability (before and after irradiation). Transportation of Np-237 to and from the reactor site for storage and/or processing will also be addressed in this EIS. The alternatives identified for analysis have been selected on the basis of availability of facilities and technical feasibility for accomplishing the proposed production of Pu-238.

No Action Alternative #1

Under this alternative, DOE would maintain the status quo. No domestic Pu-238 production capability would be established. DOE would rely on its existing Pu-238 inventory to meet the power requirements of near-term space missions and on additional Pu-238 purchases from Russia to enable future space missions. The Department would dispose of the Np-237 currently stored at SRS.

No Action Alternative #2

Under this alternative, no domestic Pu-238 production capability would be established. However, to fulfill DOE's responsibility to maintain the RPS supply infrastructure, including the capability to produce Pu-238, DOE will evaluate the alternative of transferring the Np-237 (converted to an oxide form) from SRS to a new storage site for possible future Pu-238 production. This alternative would preserve the Np-237 for potential future use. DOE would rely on additional purchases of Pu-238 from Russia for future space missions.

Alternative Sites for Irradiation

Advanced Test Reactor (ATR) at the Idaho National Engineering and Environmental Laboratory (INEEL): Under this alternative, DOE would irradiate targets (fabricated from Np-237 currently stored at SRS) in the ATR to produce up to 2–5 kgs/year of Pu-238. ATR is an operating test reactor with a main programmatic mission to support the Naval Reactor Fuels Program. Not impacting the primary mission of the reactor would be a prerequisite of applying this alternative.

Fast Flux Test Facility (FFTF) at the Hanford Site: Under this alternative, DOE would irradiate Np-237 targets in FFTF to produce up to 2–5 kgs/year of

Pu-238 FFTF is currently in a standby mode and is being evaluated for potential production of tritium and medical isotopes and for other missions. Operating FFTF for the Pu-238 mission alone would not be economic; however, if a decision is made to restart FFTF for other purposes, it would be a reasonable alternative for Pu-238 production. A decision on the future of FFTF is anticipated during the timeframe of this EIS.

High Flux Isotope Reactor (HFIR) at the Oak Ridge National Laboratory (ORNL): Under this alternative, DOE would irradiate Np-237 targets in HFIR to produce 1 to 2 kgs/year of Pu-238. The use of HFIR for production of small quantities of Pu-238 is compatible with the primary neutron scattering and transuranic radioisotope production mission of that reactor. However, current estimates are that Pu-238 production would need to be limited to a rate of 1 to 2 kgs/year. Production of more than this amount would disrupt experimental programs currently being conducted in the HFIR core. Therefore, use of this irradiation facility would have to be supplemented by additional facilities to meet the projected demand.

Alternative Sites for Storage of Np-237, Fabrication of Targets, and Processing of Irradiated Targets

Radiochemical Engineering Development Center (REDC) at ORNL: Under this alternative, DOE would use REDC to perform all the processing activities, including Np-237 storage and target fabrication and post-irradiation processing to extract the Pu-238, and to recycle the unconverted Np-237 into new targets. REDC is located in the same complex as HFIR.

Fuels and Materials Examination Facility (FMEF) at the Hanford Site: Under this alternative, DOE would use FMEF to perform all the processing activities, including Np-237 storage and target fabrication and post-irradiation processing to extract the Pu-238, and to recycle the unconverted Np-237 into new targets. FMEF, which is located near FFTF, could be modified to install all required support facilities for the Pu-238 program. In its Surplus Plutonium Disposition Draft Environmental Impact Statement (July 1998), DOE is also analyzing the use of FMEF as a reasonable alternative for the siting of surplus plutonium disposition facilities, and this analysis could impact the use of FMEF as a reasonable alternative to perform these chemical processing operations.

Preliminary Environmental Analysis

The following issues have been tentatively identified for analysis in the EIS. This list is neither intended to be all inclusive nor is it a predetermination of potential environmental impacts. The list is presented to facilitate comments on the scope of the EIS. Additions to or deletions from this list may occur as a result of the public scoping process.

- Health and Safety: potential public and occupational consequences from construction, routine operation, transportation, and credible accident scenarios.
- Waste Management/Pollution Prevention: types of wastes expected to be generated, handled, and stored; pollution prevention opportunities and the potential consequences to public safety and the environment.
- Hazardous Materials: handling, storage, and use; both present and future.
- Background Radiation: cosmic, rock, soil, water, and air and the potential addition of radiation.
- Water Resources: surface and groundwater hydrology, water use and quality, and the potential for degradation.
- Air Quality: meteorological conditions, ambient background, sources, and potential for degradation.
- Earth Resources: physiography, topography, geology, and soil characteristics.
- Land Use: plans, policies, and controls.
- Noise: ambient, sources, and sensitive receptors.
- Ecological Resources: wetlands, aquatic, terrestrial, economically/recreationally important species, and threatened and endangered species.
- Socioeconomic: demography, economic base, labor pool, housing, transportation, utilities, public services/facilities, education, recreation, and cultural resources.
- Natural Disasters: floods, hurricanes, tornadoes, and seismic events.
- Unavoidable Adverse Impacts.
- Natural and Depletable Resources: requirements and conservation potential.
- Environmental Justice: any potential disproportionately high and adverse impacts to minority and low income populations.

Scoping Meetings

The purpose of this Notice is to encourage public involvement in the EIS process and to solicit public comments on the proposed scope and content of the EIS. DOE will hold public

scoping meetings near ORNL, INEEL, and Hanford to solicit both oral and written comments from interested parties. The date, time, and location will be announced through the local media as soon as determined but at least 15 days prior to the date of the meetings.

In order to facilitate an understanding of the program's objectives, DOE personnel will be available at the scoping meetings to explain the program to the public and answer questions. DOE will designate a facilitator for the scoping meetings. At the opening of each meeting, the facilitator will establish the order of speakers and will announce any additional procedures necessary for conducting the meetings. To ensure that all persons wishing to make a presentation are given the opportunity, each speaker may be limited to five minutes, except for public officials and representatives of groups, who will be allotted ten minutes each. DOE encourages those providing oral comments to also submit them in writing. Comment cards will also be available for those who prefer to submit their comments in written form. Speakers may be asked clarifying questions, but the scoping meetings will not be conducted as evidentiary hearings.

A toll free telephone number has been established to receive public comments. Interested parties may call (800) 708-2680 and leave a detailed message with their comments.

DOE will make transcripts of the scoping meetings and project-related materials available for public review in the following reading rooms:

U.S. Department of Energy, Freedom of Information Public Reading Room, Forrestal Building, Room 1E-190, 1000 Independence Avenue, S.W., Washington, D.C. 20585, Telephone: (202) 586-3142

Oak Ridge Operations Office, DOE Oak Ridge Public Reading Room, U.S. Department of Energy, 200 Administration Road, Room G-217, P.O. Box 2001, Oak Ridge, TN 37831, Telephone: (423) 576-1216 or (423) 241-4780

Richland Operations Office, DOE Public Reading Room, 2770 University Drive CIC, Room 101L, P.O. Box 999, mail stop H2-53, Richland, WA 99352, Telephone: (509) 372-7443

Idaho National Engineering and Environmental Laboratory, DOE-Idaho Operations Office Public Reading Room, 1776 Science Center Drive, Idaho Falls, ID 83415, Telephone: (208) 526-0271

NEPA Process

The EIS for the proposed Production of Plutonium-238 for Use in Advanced Radioisotope Power Systems for Space Missions will be prepared in accordance with the National Environmental Policy Act of 1969, the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and DOE's NEPA Regulations (10 CFR Part 1021).

A 45-day comment period on the draft EIS is planned, and public hearings to receive comments will be held approximately 3 weeks after distribution of the draft EIS. The draft EIS is expected to be issued during Spring 1999. Availability of the draft EIS, the dates of the public comment period, and information about the public hearings will be announced in the **Federal Register** and in the local news media when the draft EIS is distributed.

The final EIS, which will consider the public comments received on the draft EIS, is expected to be published during Fall 1999. No sooner than 30 days after the U.S. Environmental Protection Agency's notice of availability of the final EIS is published in the **Federal Register**, DOE will issue its Record of Decision and publish it in the **Federal Register**.

Signed in Washington, D.C., this 29th day of September 1998.

Peter N. Brush,

Acting Assistant Secretary Environment, Safety and Health.

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DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

RIN 1904-AA67

Proposed Agency Information Collection Activities; Comment Request

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, Pub. L. 104-13 (44 U.S.C. 3506(c)(2)(A)), the Office of Codes and Standards (OCS) in the Office of Energy Efficiency and Renewable Energy (EE) invites the general public and other Federal agencies to comment on the proposed information collection. OCS is soliciting