FINDING OF NO SIGNIFICANT IMPACT FOR THE ENVIRONMENTAL ASSESSMENT FOR GAP MATERIAL PLUTONIUM – TRANSPORT, RECEIPT, AND PROCESSING

ISSUED BY: United States Department of Energy
National Nuclear Security Administration

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The Department of Energy (DOE), National Nuclear Security Administration (NNSA) has completed the *Environmental Assessment for Gap Material Plutonium – Transport, Receipt, and Processing* (DOE/EA-2024) in support of the Office of Material Management and Minimization (M3). This environmental assessment (EA) evaluates the potential environmental impacts of transporting up to 900 kilograms (1,984 pounds) of plutonium from foreign countries to the Savannah River Site (SRS) for storage and processing pending final disposition.

NNSA's Proposed Action is to transport packaged plutonium by ship from foreign countries to a United States marine port of entry, transfer the packages to a specially designed DOE transporter, transport the materials to SRS, place the plutonium into an approved storage facility, and declad and stabilize some of the plutonium. Analysis of transport in the EA is based on nominal shipments of up to 50 kilograms (110 pounds) and a maximum shipment of up to 350 kilograms (772 pounds) of plutonium.

NNSA's first priority is to seek a foreign solution that does not involve bringing this material to the United States. Final decision on the acceptance of any particular shipment of plutonium from a foreign country to the United States will be contingent on confirmation that the material: 1) poses a threat to national security; 2) is susceptible for use in an improvised nuclear device; 3) presents a high risk of terrorist threat; 4) has no other reasonable pathway to assure security from theft or diversion; and 5) meets the acceptance criteria of the storage facility at SRS and that there is adequate storage capacity to accommodate the material at SRS.

NNSA sent the draft EA to the States of South Carolina and Georgia and solicited their comments during a 15-day review period. The State of South Carolina Nuclear Advisory Council (SCNAC) submitted a response acknowledging that there were no environmental impacts from the proposed action and suggesting that life cycle costs associated with long-term storage of plutonium at SRS be incorporated into the document. Because the EA does not assess long-term storage of plutonium at SRS (as noted by SCNAC, this and associated issues are the subject of other NEPA documents), no changes were made; however, the comments will be forwarded to the appropriate organization within DOE for consideration. SCNAC also suggested directly inserting information from the other NEPA documents into the EA; because these documents are already available, and to avoid making the document overly lengthy, this information was not directly incorporated. No comments were received from the State of Georgia.

NNSA has elected to implement the Proposed Action. Based on the analysis in the EA, NNSA has determined that the impacts of implementing the proposed action are not significant. Further, DOE has determined that this is not a major action significantly affecting the quality of the environment, and thus, does not require the preparation of an environmental impact statement.

FOR FURTHER INFORMATION ABOUT GAP MATERIAL PLUTONIUM, CONTACT:

Mr. Ross Matzkin-Bridger
NA-232/ Portals III Building
U.S. Department of Energy
National Nuclear Security Administration
1000 Independence Avenue, SW
Washington, DC 20585

FOR FURTHER INFORMATION ABOUT DOE'S NATIONAL ENVIRONMENTAL POLICY ACT PROCESS, CONTACT:

Mr. John Weckerle
National Environmental Policy Act
Compliance Officer
Office of General Counsel
U.S. Department of Energy
National Nuclear Security Administration
P.O. Box 5400
Albuquerque, NM 87185

SUPPLEMENTAL INFORMATION:

Background

M3, formerly known as the Global Threat Reduction Initiative (GTRI), is a vital part of the U.S. national security strategy of preventing the acquisition of nuclear materials by terrorists or other organizations for use in weapons of mass destruction (WMDs) and other acts of terrorism. The M3 mission is to reduce the quantity of vulnerable nuclear materials located primarily at civilian sites worldwide. M3's goals are to: (1) convert reactors from using WMD-usable highly enriched uranium (HEU) to using low-enriched uranium (LEU); (2) remove WMD-usable excess nuclear materials; and (3) dispose of WMD-usable nuclear materials.

For plutonium material covered by the Gap Material Removal Program (gap material plutonium), M3's first priority is to seek a foreign solution that does not involve bringing this material to the United States. M3 is working with other countries and commercial entities to identify options for disposition of the plutonium. Efforts will be made to facilitate the return of the plutonium to secure locations in the countries of origin or to transfer it to a foreign commercial facility for processing to a form that is not susceptible to use in a WMD. If no other reasonable pathway is identified to address U.S. national security interests, NNSA proposes to transport the plutonium to the United States in accordance with applicable U.S. and international requirements and manage it in accordance with NNSA plans and procedures for surplus U.S. plutonium. In the *Environmental Assessment for the U.S. Receipt and Storage of Gap Material – Plutonium and Finding of No Significant Impact* (*Gap Material Plutonium EA and FONSI*) (DOE/EA-1771) (DOE 2010a), NNSA determined that a limited quantity (100 kilograms [220 pounds]) of plutonium could be received from foreign countries for interim storage at SRS pending

disposition. The current proposal addresses additional quantities of material that have subsequently been identified as gap material plutonium.

Disposition of these additional quantities of gap material plutonium would be accomplished in the same manner as disposition of U.S. surplus plutonium. NNSA is implementing actions to disposition surplus U.S. plutonium and other fissile materials to reduce the threat of nuclear weapons proliferation. Plutonium declared surplus to U.S. national security needs will be converted to proliferation-resistant forms. Pending disposition, NNSA will ensure safe, secure storage of the plutonium.

Proposed Action

The purpose of M3's Gap Material Removal Program is to work worldwide to provide options for removing and eliminating weapons-usable nuclear materials. NNSA has identified weapons-usable gap material plutonium at facilities in foreign countries that poses a potential threat to national security, is susceptible to use in an improvised nuclear device, and presents a high risk of theft or diversion. The need for the Proposed Action is to ensure an appropriately secure option for management and disposition of gap material plutonium if it is determined that there is no other reasonable pathway to assure security from theft or diversion.

M3 has identified inventories of vulnerable plutonium and the countries in which the material is currently stored. The specific quantities that comprise the 900 kilograms (1,984 pounds) evaluated in this EA and their locations are sensitive and therefore are not included in this EA and this Finding of No Significant Impact (FONSI). M3's first priority is to seek foreign solutions that would secure disposition of the plutonium; therefore, some of the currently identified inventories may not be transported to the United States.

This EA analyzes the potential environmental impacts of the movement of 900 kilograms (1,984 pounds) of plutonium in a dozen shipments from foreign countries to the United States. Detailed information used in the analysis is provided in Chapters 2 and 4 of the EA.

The EA analyzes transportation of gap material plutonium by ship across the global commons to a U.S. seaport (the Joint Base Charleston-Weapons Station). Ocean transport of gap material plutonium would be conducted using chartered, exclusive-use ships,[1] in compliance with international and national transportation standards. The gap material plutonium would then be transported in specially designed transporters from the Joint Base Charleston-Weapons Station to SRS. The analysis includes the potential impacts of transferring gap material plutonium from the ship to the transporters. Activities at SRS to receive the plutonium would include unloading the packages of gap material plutonium, repackaging as needed to meet storage requirements, and moving the packages to a storage location. Processing operations would involve decladding, size reduction, and heating the plutonium for stabilization. After processing, material would be placed in appropriate, approved containers and transferred to the storage area.

[1] *Exclusive-use ships operate as chartered vessels and are not used for the transport of any other cargo other than the plutonium (and potentially highly enriched uranium) they are hired to transport.*

Eventual disposition of gap material plutonium would be in accordance with decisions made for disposition of U.S. surplus plutonium. As discussed in Chapter 1, Section 1.5.2, of the *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)* (DOE/EIS-0283-S2), the 13.1 metric tons (14.4 tons) of surplus plutonium analyzed in the EIS included 0.9 metric tons (0.99 tons, or 900 kilograms) of excess capacity to allow for the possibility that DOE may identify additional quantities of surplus plutonium that could be processed for disposition through the facilities and capabilities analyzed in the *SPD Supplemental EIS*. Therefore, the impacts from activities related to the eventual disposition of the 900 kilograms (1,984 pounds) of plutonium analyzed in this EA have already been evaluated in the *SPD Supplemental EIS*.

Environmental Impacts

The analysis in the EA shows that the proposed receipt of gap material plutonium from foreign nations and storage and processing in the United States entails little or no risk to human health or to the quality of the environment. To provide a reasonable analysis that bounds the potential impacts of the actual shipments, the EA analyzes the potential environmental impacts for up to 12 shipments. The maximum size of any one shipment is assumed to be 350 kilograms (772 pounds) and the remaining shipments are assumed to be up to 50 kilograms (110 pounds) each.

For the Proposed Action, the EA evaluates the potential impacts of ship transport across the global commons, transfer from the ship to specially designed transporters, ground transport to SRS, and receipt, storage and processing at SRS. The analysis demonstrates that no latent cancer fatalities would occur among ships' crews, workers unloading containers from ships, ground transportation personnel, or the public. To ensure that doses to workers and crew involved with the transportation of the plutonium are maintained within applicable limits, NNSA would extend the mitigation plan in place for the Foreign Research Reactor Spent Nuclear Fuel Acceptance Program to also cover gap material plutonium. Under this plan, NNSA would require radiation surveys of packages before shipment and use of this data to ensure that estimated doses to any persons involved in ship transport of gap material plutonium would comply with applicable radiation safety requirements.

The EA evaluates the probability of a severe port accident that would result in the release of plutonium, and determined that probability to be 5×10^{-9} per ship arrival in port. This is smaller than the probability that DOE considers for analysis of maximum reasonably foreseeable accidents (1×10^{-7}, or 1 chance in 10 million); therefore, the consequences of this accident were not evaluated in this EA.

The incremental radiological impacts of managing the 900 kilograms (1,984 pounds) of gap material plutonium at SRS would be a small fraction of the impacts previously analyzed for managing 50,000 kilograms (approximately 110,000 pounds) of U.S. surplus plutonium. The likelihood of an intentional destructive act associated with transport of gap material plutonium to SRS would be minimized by the security measures that would be taken to reduce knowledge of and access to the shipments.

External Review and Comments

NNSA sent the draft EA to the States of South Carolina and Georgia and solicited their comments during a 15-day review period. The State of South Carolina Nuclear Advisory Council (SCNAC) submitted a response acknowledging that there were no environmental impacts from the proposed action and suggesting that life cycle costs associated with long-term storage of plutonium at SRS be incorporated into the document. Because the EA does not assess long-term storage of plutonium at SRS (as noted by SCNAC, this and associated issues are the subject of other NEPA documents), no changes were made; however, the comments will be forwarded to the appropriate organization within DOE for consideration. SCNAC also suggested directly inserting information from the other NEPA documents into the EA; because these documents are ready available and to avoid making the document overly lengthy, this information was not directly incorporated. No comments were received from the State of Georgia.

DETERMINATION:

The Proposed Action is to transport up to 900 kilograms (1,984 pounds) of gap material plutonium by ship to the United States, transport the material in specialized transporters to SRS, place the plutonium into an approved storage facility, and declad and stabilize some of the plutonium. NNSA will extend the existing mitigation plan in place for the Foreign Research Reactor Spent Nuclear Fuel Acceptance Program to the receipt of gap material plutonium to ensure that potential doses to workers and crew involved with the transportation of the plutonium are maintained within acceptable limits. The potential environmental impact associated with the transport, storage and processing of the gap material plutonium entail minor impacts and low risks, and do not constitute a major federal action significantly affecting the quality of the human environment within the context of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321), the Council on Environmental Quality NEPA regulations (40 CFR 1500-1508), and the Department of Energy NEPA implementing regulations (10 CFR 1021). Therefore, based upon the analysis of the EA, an environmental impact statement is not required.

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Anne M. Harrington
Deputy Administrator
For Defense Nuclear Nonproliferation
National Nuclear Security Administration
United States Department of Energy