

**FINDING OF NO SIGNIFICANT IMPACT
FOR THE
TRANSPORTATION OF HIGHLY ENRICHED URANIUM
FROM THE RUSSIAN FEDERATION
TO THE Y-12 NATIONAL SECURITY COMPLEX**

ISSUED BY: United States Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY:

The United States (U.S.) Department of Energy (DOE) proposes to transport highly enriched uranium (HEU) from Russia to a secure storage facility in Oak Ridge, TN. This proposed action would allow the United States and Russia to accelerate the disposition of excess nuclear weapons materials in the interest of promoting nuclear disarmament, strengthening nonproliferation, and combating terrorism. The HEU would be used for a non-weapons purpose in the U.S. – as fuel in research reactors performing solely peaceful missions.

The amount of HEU to be transferred under the proposed action would be, on average, 166 kilograms (366 pounds) per year over a period of 10 years. The entire shipping campaign would be conducted under very high security. The Russian Federation would be responsible for packaging the material in appropriate packages that meet international and U.S. safety standards. The Russian Federation would also be responsible for transporting the material to a point of transfer, which could be in Russia or a cooperating European country. The U.S. would then take possession of the material and assume responsibility for its security and transport. The proposed action is to transport the HEU by U.S. military aircraft from Russia or a cooperating European country to the McGhee Tyson Air National Guard Base near Knoxville, TN, then by Safe Secure Transport/SafeGuards Transportation (SST/SGT) to the Y-12 National Security Complex (Y-12 Complex) in Oak Ridge, TN.

DOE has prepared an environmental assessment (EA) for this proposed action, the *Environmental Assessment for the Transportation of Highly Enriched Uranium from the Russian Federation to the Y-12 National Security Complex (DOE/EA-1471)*. Two action alternatives to the proposed action were evaluated in the EA: 1) air transport to Dover Air Force Base near Dover, DE, then SST/SGT transport to the Y-12 Complex and 2) ship transport to a mid-Atlantic military port, then SST/SGT transport to the Y-12 Complex. Based on the analysis in this EA, DOE has elected to implement either the proposed action or the alternative of air transport to the Dover Air Force Base. 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.

A draft of the EA was sent to the States of Tennessee and Delaware for review. Comments received from the State of Tennessee were considered in finalizing the EA.

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SUPPLEMENTAL INFORMATION:

Background

The proposal to remove weapons-usable fissile material from the Russian stockpile and apply it to a peaceful purpose is one action in a long line of continuing efforts to support the common interest of the United States and Russia in guaranteeing the irreversibility of nuclear disarmament, strengthening nonproliferation, and combating terrorism by accelerating the disposition of excess nuclear weapons materials. The *Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Disposition of Highly Enriched Uranium Extracted From Nuclear Weapons* (HEU-LEU Agreement) was signed on February 18, 1993. This agreement, which remains in force until 2013, was developed to further arms control and nonproliferation efforts of the United States and the Russian Federation. The HEU-LEU Agreement provides for the United States purchase of low enriched uranium (LEU) derived from 500 metric tons (551 tons) of HEU extracted from Russian nuclear weapons.

In September 2002, Secretary of Energy Spencer Abraham and Russian Minister of Atomic Energy Alexander Rumyantsev issued a Joint Statement regarding a number of initiatives that could lead to further reductions of HEU inventories. One of these initiatives involves using Russian HEU to fuel selected U.S. research reactors. A supplement to the HEU-LEU Agreement is being negotiated for this purpose. The proposed action or an alternative analyzed in this EA is necessary to implement this initiative.

Proposed Action

Under the proposed supplement to the HEU-LEU Agreement regarding fuel for research reactors, the U.S. would purchase 166 kilograms (366 pounds) of HEU per year, on average, over a 10-year period, from the Russian Federation. The HEU would come from existing Russian stock. The Russian Federation would be responsible for ensuring that the chemical and isotopic composition of the material conforms with agreed-to technical specifications such that it would be usable as fuel for the research reactors and would meet the Y-12 Complex acceptance criteria for storage. A procurement contract

implementing the supplement to the HEU-LEU Agreement would allow U.S. employees or contractors to observe the packaging of HEU into containers for shipment and the sealing of the containers.

The EA analyzes transporting up to two years' worth, or 332 kilograms (732 pounds), of HEU at a time. The proposed action includes the use of any of three shipping containers, depending on their availability. The containers range in payload from 7 kilograms (15.4 pounds) up to 14 kilograms (30.9 pounds) of HEU. All of these containers are certified Type B packages that would meet the International Atomic Energy Agency Safety Standard Series no. TS-R-1, *Regulations for the Safe Transport of Radioactive Material*.

The location at which the U.S. would take possession of the material has not yet been determined, but it could be St. Petersburg, another location in Russia, or a location in Europe. The specific location will be the subject of negotiation among the involved countries, but the EA analyzed an air travel distance sufficient to accommodate any of these locations. The EA evaluates impacts associated with transportation of the HEU within the U.S. and on the global commons, those areas of the Earth outside the jurisdiction of any nation (e.g., the ocean). The U.S. intends to secure permission for overflight of any countries that must be traversed if an aircraft is used to transport HEU to the U.S. Packaging of the material and transportation to the location at which the U.S. would take possession would be the responsibility of the Russian Federation. The EA does not evaluate the impacts of actions taken in Russia or from the overflight of any other foreign nations.

The proposed action is to use U.S. military C-17 aircraft to transport the HEU. Depending on the departure and arrival points, it may be necessary to refuel the aircraft once during each flight. KC-135 tanker aircraft operated by the U.S. military would perform the in-air refueling operation. C-5 or C-141 aircraft could also be used. All three of these aircraft have adequate payload capacity and cargo holds capable of accommodating the required number of HEU containers.

The proposed action is to transport the HEU by air to McGhee Tyson Air National Guard Base in Tennessee. Alternative 1 involves an alternative aerial port of entry: Dover Air Force Base in Delaware. Alternative 2 involves transport by ship to a representative mid-Atlantic military port. From any of these port(s) of entry, the HEU would travel by trucks with special security measures to the Y-12 Complex in Tennessee.

The proposed action involves the use of existing infrastructure in the way of airfields, ports, handling equipment, and roadways. The EA does not analyze in detail the potential impacts to biological, cultural, geological, or water resources or to socioeconomics. Since there would be no construction or processing of any sort, there would be no land disturbance that could potentially affect biota, cultural resources, or geologic media. No water would be withdrawn or discharged to surface water or groundwater. The proposed action would not have any appreciable effect on socioeconomic conditions at any of the analyzed locations. All work would be accomplished making temporary use of existing personnel. The duration of the personnel involvement would be a relatively small portion of any given year, avoiding the need to add to the workforce.

DOE expects to store the HEU for 1 to 2 years. Following any preparation necessary to make it compatible with fabrication equipment, Y-12 Complex personnel would send it from the Y-12 Complex in Oak Ridge, TN to the BWX Technologies facility in Lynchburg, VA, where it would be fabricated into

reactor fuel. Following fabrication, the fuel would be transported to the research reactors¹ for use. Managing the HEU at the Y-12 Complex, transporting it from the Y-12 Complex to the BWX Technologies facility, fabricating the HEU into fuel, transporting the fuel to the reactors, and operating the reactors are all ongoing actions whose environmental impacts have been addressed previously.

Resolution of Comments Received

A draft of the EA was sent for comment to the States of Tennessee and Delaware. In response to comments received from the State of Tennessee after reviewing a draft, the following changes were made to the EA:

- Reference to “pre-processing” HEU at the Y-12 National Security Complex has been eliminated to avoid the impression that there is significant processing work being performed. The text now refers to preparing the HEU so that it is compatible with the equipment at the fuel fabrication plant and notes that the preparation work is addressed under other NEPA documentation (i.e., the *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex*).
- The discussion of the aircraft landing accident has been revised to make it clear that the analysis assumes failure of all of the containers and to explicitly state the amount of material that is released to the atmosphere.
- The ground transportation accident analysis discussion has been revised to state that it was assumed that the vehicle transporting the HEU travels at 55 miles per hour regardless of whether it is traveling in a rural, suburban, or urban setting. This replaces an inaccurate statement implying the maximum speed limit is 55 miles per hour.

These changes were made to improve the clarity and accuracy of the document. They did not result in any changes to the analysis of the environmental impacts.

Environmental Impacts

The analysis in the EA shows that the proposed transfer of HEU from Russia to the United States entails little or no risk to the quality of the environment or to human health. This is true independent of the port of departure from Russia or Europe and the aerial port of entry into the United States, i.e., the proposed action of landing at the McGhee Tyson Air National Guard Base or the alternative of landing at the Dover Air Force Base. It is also true independent of the choice of containers or the choice of aircraft. The HEU would be transported in Type B containers that meet both United States and International Atomic Energy Agency standards. There would be an average of one shipment per year, which would represent a very small increase in the number of airplanes crossing the Atlantic Ocean every year. The necessary ground transportation to the Y-12 Complex also represents a very small increase in the normal amount of truck traffic and associated risks of a traffic accident.

The radiological risks to the public and workers from normal operations and accident conditions under the proposed action and the two action alternatives would be very small. Assuming the transport of 332 kilograms (732 pounds) in a single shipment, under the proposed action of air transport to the McGhee Tyson Air National Guard Base, the increased risk of a latent cancer fatality (LCF) in the population would be 1.8×10^{-7} . The largest population risk of developing an LCF associated with

¹Fuel will be provided to the following research reactors: the National Bureau of Standards Research Reactor, National Institute of Standards and Technology, Gaithersburg, MD; the Massachusetts Institute of Technology Research Reactor, Cambridge, MA; the University of Missouri Research Reactor, Columbia, MO; and the High Flux Isotope Reactor, Oak Ridge National Laboratory, Oak Ridge, TN.

radioactive materials released from an accident, an aircraft crash during landing, is 2.6×10^{-10} . For the alternative of landing at the Dover Air Force Base, the risk of developing an LCF from normal operations and accident conditions would be 5.1×10^{-6} and 1.8×10^{-10} , respectively. These population risk numbers are much less than 1, indicating that no increases in latent cancer fatalities in the population would be expected as a result of these activities.

The impact on a maximally exposed member of the public would be greater for ground transportation than it would be for normal or accident conditions at an airfield. Regardless of the alternative, the maximally exposed individual member of the public would experience an increased chance of developing an LCF equal to 1.4×10^{-10} , or less than one chance in a billion, for normal ground transportation operations. Under severe traffic accident conditions, the radiological risk to the maximally exposed individual, regardless of the alternative, would be 1.8×10^{-13} , or less than 1 chance in a trillion.

DOE estimates that the greatest risk to the public is the risk of a traffic fatality during ground transportation. The estimated traffic fatality risk is 2.2×10^{-6} for the proposed action and 6×10^{-5} for the alternative involving transport from Dover Air Force Base.

Worker radiological risk for the proposed action would be 3.8×10^{-7} for a member of the air transport crew and 2.6×10^{-7} for a member of the ground transport crew. For the alternative of landing at the Dover Air Force Base, the radiological risk to a member of the air transport crew is slightly less, 3.4×10^{-7} , and the risk to a member of the ground transport crew is larger, 7.1×10^{-6} . Under either the proposed action or the Dover Air Force Base alternative, the dose to a worker transferring packages of HEU from the aircraft to the SST/SGT would be about 6×10^{-6} . For each of these cases, the risk of a latent cancer fatality is less than 1 in 140,000.

DETERMINATION:

The proposed action is to transfer 166 kilograms (366 pounds) of HEU per year, on average, over a 10-year period from Russia to the United States. The proposed action of air transport to the McGhee Tyson Air National Guard Base and the alternative of air transport to the Dover Air Force Base, followed by ground transport to the Y-12 Complex, have been analyzed for as much as 332 kilograms (732 pounds) in a single trip. Both the proposed action and the alternative entail minor impacts and low risks and do not constitute a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act. Therefore, based upon the analysis in the EA, an Environmental Impact Statement is not required.

Issued this 15 day of JANUARY 2004, in Washington, D.C.



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