FINDING OF NO SIGNIFICANT IMPACT
FUEL PRODUCTION FACILITY
SAVANNAH RIVER PLANT, AIKEN, SC

AGENCY: Department of Energy

ACTION: Finding of No Significant Impact for the construction and operation of a new Fuel Production Facility, Building 225-H.

SUMMARY: The Department of Energy (DOE) has prepared an environmental assessment (EA) for the construction and operation of a new Fuel Production Facility, Building 225-H, at the Department of Energy Savannah River Plant (SRP) near Aiken, South Carolina (DOE/EA-0319). Based upon the analyses in the EA, the DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et. seq. Therefore, the preparation of an environmental impact statement is not required.

BACKGROUND: The project involves the construction and operation of a new Fuel Production Facility, Building 225-H, at the Department of Energy's Savannah River Plant (SRP) near Aiken, South Carolina. The facility will provide for SRP recycling of uranium and eliminate shipments of liquid uranyl nitrate between SRP and the Oak Ridge Reservation (OR), Tennessee. The new facility will be located near the center of the plant site in an SRP chemical separations area adjacent to the source of its feed

materials. The new facility will convert enriched uranyl nitrate solution to uranium oxide with an Onsite Uranium Recycle (OSUR) process. The uranium oxide will then be fabricated into fuel billet cores using a Powder Metallurgy (PM)-based process. The OSUR process will replace a process now used to recover uranium from reprocessed SRP reactor fuel at the OR Y-12 Plant. Presently, the uranium is converted to metal and then returned to SRP for fabrication of reactor fuel in Building 321-M. The PM process will replace the casting and machining process now used at SRP to form fuel billet cores from a U-Al metal alloy. Present SRP and OR facilities for fuel production have been in operation since the late 1950's.

Continued usage of the present OR facilities for fuel processing and conversion would necessitate continuing uranium shipments between SRP and OR. The present SRP facilities contain casting and machining equipment which make incorporation of the PM process difficult and less cost effective. PM allows lower U-232 content in the fuel, extending its ability to be recycled and avoiding the potential need to replace low-U-235 fuel with fresh high-U-235 fuel feed stocks. The new facility will increase SRP reactor productivity, reduce fuel manufacturing costs, reduce waste costs, improve personnel safety, improve security, and eliminate offsite uranium shipments and the risk of transportation accidents, while reducing uranium releases to the environment.

The 15-acre site is located adjacent to existing SRP operating areas, H-Area and S-Area. The H-Area perimeter fence will be moved to include the new fuel production facility. Minor construction impacts will be experienced, but there will be no increase in particulate emissions at the nearest SRP boundary, seven miles away. The peak construction work force of 205 workers will be composed of existing SRP construction workers who will be finishing other projects and will have minimal effects on land use, housing and social services. No significant impacts are expected on ecological resources or archaeological and historic sites.

Once operational, the new facility will employ 186 people, many already employed at SRP. Liquid effluents from operations will be recovered or treated to prevent the release to the environment of hazardous materials (hazardous by characteristic), such as caustic solutions from the PM process and nitric acid from the OSUR process. At SRP, high-level radioactive waste is expected to be generated at the new fuel facility at a rate that is 15 percent lower than present rates. At OR, the annual generation of 10 metric tons of the radioactive waste, calcium fluoride slag, would be eliminated because no reduction to metal would be required for SRP fuel.

The new facility will be a high resistance, reinforced concrete structure with a sealed concrete floor. Equipment in the central processing area will be contained in secondary enclosures or glove

boxes to provide radiation shielding, containment, and filtered ventilation. The process wing will meet the 0.17 g seismic resistance construction requirements. A computer system will provide controls for processing equipment and maintain an inventory of process materials. Safety systems and security systems to be installed will include nuclear incident monitors, fire detection-suppression equipment, hardened entry controls, and electronic and video monitoring to protect Special Nuclear Materials. Building ventilation facilities will include High Efficiency Particulate Air (HEPA) filtration, a process exhaust system, and a 125-foot exhaust stack to reduce releases to the environment.

Routine operation of the new facility will result in the reduction of high-level and low-level radioactive waste, radioactive air emissions, nonradioactive air emissions, and radiation exposure to operations personnel. The new facility will eliminate personnel hazards associated with the molten metal casting process, such as burns from furnace heat. Radioactive airborne releases from the new facility will be extremely small. An estimated 5.1E-05 Ci of uranium and 2.8E-04 Ci of ruthenium will be released annually to the atmosphere at maximum operation. At the plant boundary, the maximum individual dose from annual releases is projected to be 6.3E-05 mrem, which is 0.0025 percent of the U.S. Environmental Protection Agency standard for routine

radiological releases to the atmosphere (40 CFR 61). The most severe credible accident (earthquake) would result in a maximum individual dose (at the SRP boundary) of 1.8E+01 mrem (lungs), well below proposed DOE standards for accidents (DOE Order 6430, Ch.I).

ALTERNATIVES: In the EA, the DOE considered the following alternatives to the proposed action of constructing the new fuel production facility in the H-Area on SRP: no-action, OR facility upgrade, and an alternative site at SRP.

The no-action alternative was determined to be unacceptable because uranium shipments between OR and SRP would continue, operations would not improve, and environmental releases would not decrease. The OR facility upgrade alternative was determined to be undesirable because offsite uranium shipments would continue, recovery costs would remain high, upgrading required for the Y-12 facilities would be extensive, and environmental releases and waste generation would not decrease. The alternative to locate the facility at a different SRP location was determined to be undesirable because onsite uranium shipments would be required and it would not be as efficient as locating the facility next to the source of feed material. This alternative would necessitate shipping uranium from SRP separations facilities to an alternate site with corresponding increases in environmental and accidental risk and costs.

FINDINGS: The proposed Fuel Production Facility does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act. Therefore, an Environmental Impact Statement for the proposed action is not required. This finding is based on the analyses in the EA.

POINT OF CONTACT: Requests for a copy of the Environmental Assessment should be directed to Mr. Steve Wright (803) 725-3957, U.S. Department of Energy, Savannah River Operations Office, Environmental Division, P.O. Box A, Aiken, South Carolina 29801.

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