

NOTICES

DEPARTMENT OF ENERGY

Office of Deputy Assistant Secretary for Nuclear Waste Management

Double-Shell Tanks for Defense High-Level Radioactive Waste Storage, Savannah
River Plant, Aiken, S.C.

Wednesday, July 9, 1980

***46154** Record of Decision

Decision. The decision has been made to complete the construction of the 14 double-shell tanks and use them to store defense high-level radioactive waste at the Savannah River Plant (SRP).

Background. The SRP, located near Aiken, South Carolina, is a major installation of the Department of Energy (DOE) for the production of nuclear materials for national defense. It began operations in the 1950's and is currently the nation's primary source of reactor-produced defense materials. As a byproduct, the SRP operations produce liquid high-level radioactive waste from the chemical processing of fuel and target materials after irradiation in the SRP nuclear reactors.

The high-level liquid radioactive wastes are presently stored in four different types of tanks (Types, I, II, III & IV). In 1974, SRP began a tank replacement programs to (1) accommodate storage of fresh radioactive wastes as they are generated by production operations and (2) replace all older-design tanks with Type III tanks. The new tanks are intended for storage of the waste until long-term disposal/isolation can be implemented. This program was discussed as the base case (Alternative 4) in the Final Environmental Impact Statement on Waste Management Operations, Savannah River Plant, ERDA-1537 (Sept. 1977).

The Federal District Court for the District of Columbia (Natural Resources Defense Council (NRDC) v. Administrator, ERDA/DOE), directed on September 29, 1979, that a supplemental environmental impact statement be prepared to address design and safety alternatives of the ten waste storage tanks authorized in FY 1976 and FY 1977 projects at SRP. DOE published the final environmental impact statement Double-Shell Tanks for Defense High-Level Radioactive Waste Storage, Savannah River Plant, Aiken, South Carolina, DOE/EIS-0062, in April 1980. Notice of its availability was published in the Federal Register by the Environmental Protection Agency on April 18, 1980 (Vol. 45, No. 77, page 26457). The environmental impact statement goes beyond the court requirement in that four additional tanks authorized in an FY 1978 project are also included. On April 30, 1980, the Federal District Court concluded that DOE had fully complied with the Court's order of September 29, 1979, by writing an environmental impact statement that complied with the National Environmental Policy Act (NEPA). Description of Action. The DOE action is to complete construction and utilize in waste management operations the 14 Type III tanks under consideration in this statement; the 14 tanks are in various stages of construction. The Type III tanks differ from Types I, II, and IV tanks in that the primary tank is heat-treated after field erection to remove residual stress due to welding. The heat treatment is to help prevent stress corrosion cracking that has been experienced in nine Type I and II tanks which were not heat-treated. No leaks have been detected in any of the nine Type III tanks that are now in service.

Other major design improvements in Type III tanks include:

Full height steel secondary vessels, rather than 5-ft pans used in Types I and II tanks.
A single roof support column mounted on the foundation pad rather than on the bottom

of the primary tanks.

Air cooling of the center column and bottom of primary tank.

Bottom-supported cooling coils distributed throughout the tank.

Significant engineered safety features are also incorporated in the design to provide for prompt leak detection, ventilation, emergency power, and protection against natural events.

Description of Alternatives. The alternative to completing construction of the 14 Type III tanks for utilization involve stopping the construction in order to consider the following:

1. Thicker and more chemically resistant tank steel,
2. Cathodic protection, and
3. Better waste retrieval equipment and enlarged tank openings to facilitate waste retrieval.

The no-action alternatives were discussed in ERDA-1537 and are not considered in this document.

Basis for Decision. The high level liquid radioactive waste has been and is stored safely in underground Type III tanks that are engineered to provide reliable storage of the waste. This is accomplished through conservative design of the waste tanks, incorporation of engineered safety features, and proper implementation of a prescribed operational and maintenance program.

Thicker steel is not required because thinning due to general corrosion is not a problem and thicker steel would not prevent stress corrosion. The issue of more chemically resistant plates has, in essence, been adopted via the change to a heat-treated steel and post-fabrication stress relief of the primary tanks. These treatments should also eliminate stress corrosion.

Cathodic protection from corrosion was considered in 1972. The benefits of cathodic protection for waste tanks were judged to be small in comparison with the uncertainties and problems of installing such a system in a tank with widely varying contents; while protection may be afforded in one part of a tank, there may be a deleterious effect in another part of the tank.

Although adequate waste removal techniques have been demonstrated, salt and sludge removal and chemical cleaning tests during 1980 will investigate improved methods and will *46155 demonstrate performance of equipment for waste retrieval.

Enlarged tank openings are not included in these new Type III tanks. The long-shafted pumps that can be used to remove liquid waste, redissolved salt, or sludge slurry from SRP waste tanks are designed to fit into any tank riser two feet or larger in diameter.

These 14 Type III tanks contain nine access risers three feet or larger in diameter which can accommodate these pumps. Pumping of all three waste forms has been successfully demonstrated in existing SRP waste tanks, and the equipment was safely retrieved.

Thus, the design alternatives were rejected because no unique advantages were identified for the alternatives and because there are definite disadvantages (cost, delays, and potential problems) associated with the proposed design alternatives.

Discussion of Environmentally Preferred Alternatives. None of the design alternatives would have any environmental advantage over the tanks as presently designed.

Incorporation of any of the design alternatives would require modification of the tanks under construction and commitment of additional resources. Also, the preferred alternative will result in taking older design tanks out of service earlier and might result in reduced radioactive releases.

Consolidation in Implementation of the Decision. Completion of construction for utilization of the 14 Type III tanks would maintain operational flexibility and enhance environmental protection by removing waste from older design tanks, some with known leaks. In view of the protective operating procedures and surveillance program to be followed throughout the life of the tanks along with the significantly improved design features, it has been concluded that the tanks are adequate for interim storage of the high-level radioactive waste.

For the United States Department of Energy.

Dated: July 1, 1980.

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Deputy Assistant Secretary for Nuclear Waste Management.

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