

waste to be handled by 1980 has dropped by a factor of about 7—from 36 million gallons to approximately 5 million gallons. Even with the currently projected nuclear power growth rate, the accumulated waste volumes by the year 2000 are estimated at about 80 million gallons, which is comparable to the high activity waste volumes which have been satisfactorily managed by the Commission in its operations to date.

These estimates are based on an assumption that the wastes would be stored as liquids for long terms in underground tanks. However, with the satisfactory development of processes for conversion of high-level liquid wastes to stable solids (now in the engineering demonstration phase), with subsequent long-term storage or disposal in a dry geologic formation such as salt (now in the field testing stage), technology for an alternative waste management system will become available. With adoption of a conversion-to-solids waste management concept, approximately 1 cubic foot of solid waste would be produced per hundred gallons of high-activity waste (per 10,000 MW_e of fuel exposure). Preliminary engineering and economic evaluations indicate a 30-year interim storage of waste solids would be desirable before final disposal; by the year 2000, the rate of production of waste solids for final disposal or long term storage would require about 2.8 acres of salt mine floor space per year. (Additional information on salt disposal is provided under the Section "Long-term Safety of High-Activity Waste Storage".)

During the past year, various task force groups have been involved in an extensive cooperative effort to update the 1962 Report to the President on Civilian Nuclear Power. Included in this effort is a study of nuclear power growth patterns in the U.S. to the year 2020 in order to determine the size and location of fuel reprocessing plants and associated waste management requirements. An up-to-date comprehensive long-range waste management plan is also being developed, taking into account the latest power projections and fuel reprocessing plant size and locations, in order to determine the number and size of permanent high-activity waste storage sites which may be required. It is planned that reports of these studies will become available to industry and the public upon their completion.

In a related question, some concern has been expressed on the decommissioning of power reactors and the associated disposition of the reactor site, if this should be required. Nuclear power plants are currently being built using a design life basis of forty years. If, for some reason, it is decided to retire the plant, procedures for dismantling the plant would be subject to Commission approval and would be required to meet the Commission's standards for protection of the worker and the general public. Decommissioning alternatives, which require evaluation, include varying degrees of "moth-balling" the plant, i.e., decontaminating, dismantling and removing the facility (in whole or in part) and burial in place or at an approved disposal facility. Procedures for these operations must be submitted to the Commission in accord with its regulations, to assure that adequate safety measures will be taken in the course of decommissioning the reactor, and with respect to any sources of radiation that may thereafter remain at the site. Experience is being gained in moth-balling plants, such as the Hallam Nuclear Power Facility in Nebraska and the Carolinas-Virginia Tube Reactor in South Carolina, which indicates that power reactors can be decommissioned safely.

TRANSPORTATION OF RADIOACTIVE MATERIALS

The principal hazards which must be guarded against during the transport of radioactive or fissile material are accidental criticality (nuclear chain reaction) and release of radioactive material or radiation because of loss of containment or shielding as a result of impact or exposure to a severe fire. These hazards are avoided by specifying the shipping conditions, carefully controlling the quantity of fissile material which may be shipped in a single container, and by designing and fabricating the shipping containers to withstand a series of hypothetical accident conditions, including severe impact and fire. Each shipment, including container design, must meet the requirements of various regulatory agencies, including the AEC and the Department of Transportation.

The shipping experience of AEC contractors and licensees has been exceptionally good. During the transportation of this material there has been no death or injury due to the radioactive nature of this material.