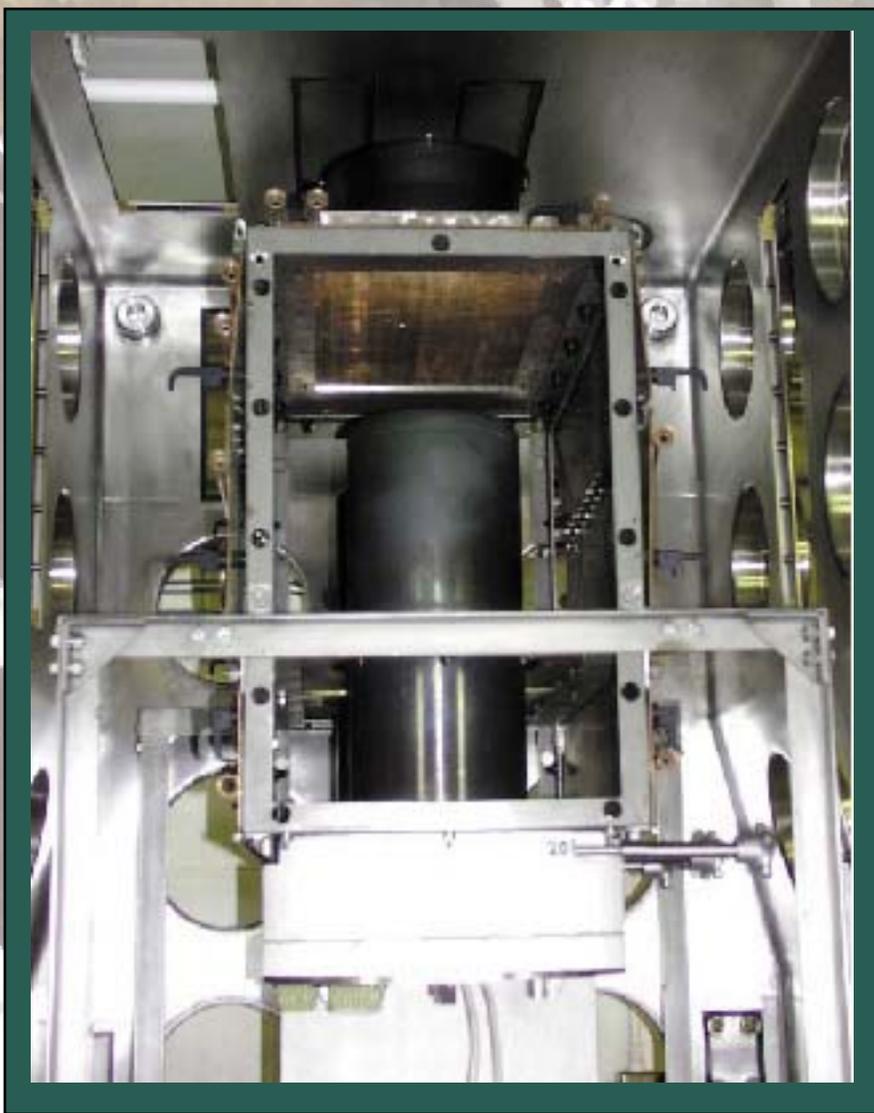


Salt Distillation System

Nuclear Materials Technology Division

Production-scale equipment for salt distillation is currently being tested for use in the Plutonium Facility (TA-55) at Los Alamos National Laboratory. The salt distillation system is designed to treat wastes from pyrochemical operations. This technology will eliminate the waste stream associated with the purification of metal. The equipment is designed for ease of operability and maintainability. The system is integrated into a glovebox located within the plutonium processing area of TA-55. The process of salt distillation is actually a two-step operation. The first step, which is performed on monovalent chloride salts from pyrochemical operations, is the complete oxidation and/or conversion of all actinide species to oxides. This is accomplished with a carbonate compound, typically either potassium or calcium carbonate. The second step is to then distill the monovalent chloride salts away from the metal oxides. The difference in vapor pressure at the operating temperature of the distillation still between the metal oxides and the chloride salts is typically 10-12 orders of magnitude. The salt distillation furnace vessel is operated at 950°C and a vacuum of 1 milli Torr and has achieved nearly perfect separation of salts and oxides.



View of Salt Distillation Equipment Showing the Furnace Chamber



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