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**DOE signs Record of Decision selecting Hot Isostatic Pressing Technology for Treatment of High Level Waste**

The U.S. Department of Energy (DOE) has signed the Record of Decision (ROD) for the treatment of high level waste calcine at the Department's Idaho Site, meeting a legal commitment to the State of Idaho for a decision no later than the end of 2009.

DOE today announced its decision to treat high-level waste (HLW) calcine using an industrially mature manufacturing process known as hot isostatic pressing (HIP). DOE selected this technology to treat roughly 5,750 cubic yards of highly radioactive waste generated from the reprocessing of spent nuclear fuel to recover uranium. Reprocessing of spent nuclear fuel was terminated by a DOE policy decision in 1992.

HIP allows for a significant volume reduction over vitrification, is more suitable for the dry heterogeneous calcine material, and has cost and schedule benefits over other alternatives. The decision to select HIP over other reasonable alternatives was based on the ability of this process to produce a waste form that meets the comparable waste acceptance criteria as vitrification into borosilicate glass, which is the method of treatment decided for liquid HLW at the Savannah River Site in South Carolina and the Hanford Site in Washington.

In the HIP process, calcine and treatment additives are mixed and then loaded into thin wall canisters that are welded shut. These canisters are placed in a pressure vessel which is heated to "melt" the calcine mixture while being pressurized with argon gas. The net effect is production of a waste form that will meet or exceed any disposition criteria likely to be established for HLW by DOE. If an ultimate disposition criterion does not require further treatment of calcine (i.e., utilizing the treatment additives to produce a ceramic waste form), this HIP process will be used without treatment additives to reduce the volume of material to be dispositioned, at significant cost savings. The HIP technology and facilities could also be used for other waste treatment or other missions once the calcine treatment campaign is completed.

DOE and the State of Idaho reached a legal agreement in 1995 known as the Idaho Settlement Agreement that, among other things, provides for DOE to treat high-level waste calcine to a form that allows for ultimate disposition out of the State of Idaho. This treatment must be accomplished by a target date of the end of 2035. Issuing the ROD by the end of 2009 is an interim requirement in the Settlement Agreement. The Settlement Agreement also requires DOE to submit an associated application for a RCRA Part B permit application to the State of Idaho by December 2012. "The Department is committed to meeting its obligations to the State of Idaho in a timely manner," stated Ines Triay, head of DOE's Office of Environmental Management.

Roughly nine million gallons of liquid HLW was generated between 1952 and 1991 at the Idaho Nuclear Technology and Engineering Complex (known prior to 1998 as the Idaho Chemical Processing Plant). This acidic waste was stored in eleven 300,000 gallon stainless steel tanks and fed to a high temperature process which converted the liquid to a dry granular powder similar in form to laundry detergent. This process, known as calcination, accomplished a seven to one volume reduction and reduced the risk to the Snake River Aquifer by elimination of wet storage. The calcine powder was then pneumatically transferred to cylindrical stainless steel tanks, known as bins, which are further contained within large shielded and reinforced concrete cylindrical vaults. Six shielded vaults hold 43 bins and are referred to as bin-sets. They were designed by engineers to provide safe storage for several hundred years.

Seven of the 300,000 gallon tanks formerly containing HLW have been taken out of service and filled with grout. Of the four remaining tanks, three contain roughly nine hundred thousand gallons of liquid sodium bearing waste (SBW) that was planned to be calcined before a decision was made to cease calcining in 2000. In a previous ROD, published in December 2005, DOE decided that this remaining liquid waste will be treated using the steam reforming technology in a facility known as the Integrated Waste Treatment Unit (IWTU), which is currently under construction. The IWTU will convert the liquid SBW to a dry carbonate granular waste-form similar to calcine and package it by the end of 2012, in accordance with the Idaho Settlement Agreement. Upon completion of this mission, the remaining four 300,000 gallon tanks will be taken out of service and grouted. The HIP process used for calcine treatment could provide for further treatment or volume reduction of the dry SBW, if required.