



# U.S. DEPARTMENT OF **ENERGY**

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**IMPROVED ACCESS TO HANFORD SINGLE SHELL TANK  
WILL SPEED RADIOACTIVE WASTE REMOVAL**  
*55-Inch Hole Safely Cut into the Dome of Tank C-107 over the Weekend*

**Richland** - - Installation of the Mobile Arm Retrieval System (MARS) into Hanford single-shell tank C-107 took another step forward on December 19, 2010 when Tank Farms contractor Washington River Protection Solutions (WRPS) and its subcontractors safely cut a 55-inch diameter hole in the top of the tank. The hole was cut through 15 inches of concrete and steel rebar in order to place a new riser for the MARS unit that will be used to remove approximately 247,000 gallons of radioactive and chemical waste.

WRPS is a prime contractor to the Department of Energy's (DOE) Office of River Protection (ORP) and is charged with eliminating the risk to the environment posed by 53,000,000 gallons of radioactive and chemical waste stored in Hanford's 177 underground tanks.

"We spent more than a year planning and preparing for this project to ensure that it would be done safely, while protecting the environment and limiting the exposure to our workers. All of our hard work paid off with the successful completion of this project," said Kent Smith, WRPS Deputy Manager of Retrieval and Closure Operations.

The 55-inch diameter hole is the largest cut into an active DOE radioactive waste storage tank and it creates the access for the largest robotic arm developed to date for removing radioactive and chemical wastes from the tanks. "We have developed robotic arms at Hanford for many years but arms that would fit into the tanks through available risers were too small to do the job. The robotic arms that were robust enough to do the job wouldn't fit into the tanks. The only option to increase retrieval efficiency was to cut a larger access into the tank," said Chris Kemp, Deputy Federal Project Director for ORP.

To cut the hole, WRPS used a conventional technology that employs high-pressure water with a fine grit of garnet to cut evenly and precisely through the concrete and rebar of the tank's dome. The water flowed through the cutting equipment at a rate of approximately three gallons per minute at a pressure of 48,000 psi, cutting 8 inches per hour. Despite winter weather conditions and freezing temperatures, the cut into C-107 took just under 24-hours to complete with no incidents.

"Even though this technology is commonly used in industry it has never been used in quite this way. We brought in AK Services of Boston, a specialty subcontractor that is used to working in

hazardous environments, trained their personnel to our safety standards and provided the support they needed to do the work,” said WRPS C-107 Project Manager Thom Myer.

Months prior to performing the cut, three different types of abrasive were tested, along with different cutting mechanisms. A mixture of water and garnet proved to be the most efficient and posed the least risk to workers, the environment, and the tank itself during the cutting operation. During the cut, air samplers were set up inside the containment tent that surrounded the project and a ventilation system was in constant operation to draw air back into the tank and reduce the potential for contamination to escape.

“I was pleased to observe this work over the weekend. It shows again that challenging work can be done safely at tank farms, and this is another step forward to getting waste out of the single-shell tanks. The progress on installation and use of the MARS equipment is encouraging and will be another tool in the waste retrieval toolbox.” said Nancy Uziemblo Washington State Department of Ecology, Nuclear Waste Program, Tank Farm Oversight and Technology Development

Prior to the start of the cut, the portion of the tank dome to be removed was bolted to a crane to prevent it from falling into the tank when the cut was complete. Once it was cut free, the plug was lifted out of its hole and immediately wrapped in a plastic sleeve to prevent any potential spread of contamination. The plug was then placed in an isolated area where it will be staged for final disposal on the Hanford Site.

Once the plug of concrete and rebar were removed a large riser was carefully set into the hole. The riser has a shield plug bolted to its opening as well as thick gasket material around the outside to seal the hole. Delivery and installation of the MARS retrieval unit is scheduled for late February 2011.

Retrieval of waste from C-107 is planned to begin next summer.

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