

## Temporary Shielding Plug for Tank Risers

The Temporary Shielding Plug has proven to be a safe, effective improvement to the process of modifying large diameter risers extending from the roof of underground radioactive liquid waste storage tanks at the Hanford Nuclear Reservation in Washington state. Its use has significantly reduced worker radiation exposure and eliminated the possibility of explosion from flammable gasses occasionally contained in the tanks.

Modifications to each 42 inch diameter tank riser required cutting and welding of the riser material on the interior and exterior riser walls. Since the riser provides direct access to the interior of the tanks, a temporary shielding plug was designed to seal the riser and block off the work area from the radiation and explosive hydrogen arising from the liquid waste in the tank. The plug contained a seal assembly that included a rubber bladder, a rubber shield to protect the bladder, six inches of steel plate shielding and two inches of water shielding. The device also included a gas monitor to detect the presence and to measure the level of hydrogen in the work area. The seal prevented hydrogen from reaching the work area and allowed the cutting and welding to be performed using standard methods. The use of these plugs adheres to the practice of ALARA (As Low As Reasonably Achievable), relative to environmental and personnel exposures, and prevents foreign material from entering the tank.

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