

## Another high-hazard cell deactivated at WVDP

WESTVALLEY -The Department of Energy (DOE) and its prime contractor at the **West Valley Demonstration Project**, completed the deactivation of the Ventilation Wash Room, which housed a ventilation "scrubber" that removed airborne particulates resulting from fuel reprocessing operations that ceased in 1972.

During deactivation, the scrubber was prepared for removal and will be removed during the future demolition of the Main Plant Process Building.

"The safe execution operations of this work is due to the combination of extensive planning, deliberate speed, and using worker feedback throughout the deactivation," said Steve Bousquet Department of Energy federal project director for the demolition. "The **WVDP** team continues its strong commitment to safely protecting its workers, the public, and the environment while reducing legacy risks at the site."

Deactivation of this cell included the removal of a 26-inch diameter ventilation duct that carried exhaust from past operations at the MPPB. This activity involved 28 cuts and the removal of 19 sections of the ventilation duct from the wash room. Finally, workers demobilized equipment, removed debris, and applied fixatives to the cell.

Incorporating feedback from workers led to a safe deactivation of the VWR, which included the idea to perform the work remotely to keep potential exposure to radiation as low as reasonably achievable (ALARA).

The operators core bored multiple penetrations into the wash room to allow the placement of a diamond wire saw outside the cell. Short entries were made into the cell to adjust the location of the diamond wire prior to each cut of the ventilation duct.

Through this approach, operators were able to limit potential exposures, in keeping with ALARA principles. Contingency plans were also included in the work instruction package to provide an effective and immediate response to a differing condition, providing operators with pre-approved instructions should conditions change.

"Working in the VWR was physically challenging when you include radiological and industrial hazards, layers of protective clothing, limited mobility and COVID protocols," said Tom Dogal, facility disposition manager. "This crew used lessons learned to enhance safety, improve efficiency, and reduce exposure to job-related hazards. They put their collective knowledge into practice."

During fuel reprocessing activities in the 1960s and '70s, several other areas within the main plant, including the product purification and chemical process cells, and a fuel receiving and storage facility - sent exhaust to the VWR through the ductwork. The exhaust was then directed to a ventilation exhaust cell where it was filtered before being discharged to the plant's stack.

## WVDP worker feedback leads to safe deactivation, path forward for demolition



*Photo provided*

Workers completed the deactivation of the Product Purification Cell-South and have applied fixative for contamination control as part of the deactivation process. The cell had previously contained high levels of contamination from former fuel reprocessing operations.

WESTVALLEY -The Department of Energy and **West Valley Demonstration Project** recently completed the deactivation of the Product Purification Cell-South (PPC-S), which contained high levels of contamination from former nuclear fuel reprocessing operations.

This effort has contributed to an overall reduction in radiological hazards that will support the demolition of the Main Plant Process Building, a DOE priority for 2022.

The PPC-S measures 5-by-16-by-57 feet and during nuclear fuel reprocessing was used to house the vessels associated with plutonium separation, concentration, material controls and batching for shipping.

Due to its configuration, this cell was a potentially oxygen-deficient confined workspace that required additional planning and work controls, including a trained and ready confined space rescue team.

"Safety is our priority throughout any and all work activities at the site," said Stephen Bousquet, federal project director for the Main Plant Process Building demolition. "This led to an impressive decontamination effort that involved a confined workspace, requiring layers of protective clothing and numerous industrial and radiological hazard controls."

After decades of deactivation work in the main plant, the PPC-S remained the largest source of radioactive material. Due to the source material and the configuration of the cell, the PPC-S provided unique challenges.

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After reviewing several different methods for deactivation and working with Radiological Engineering, a decision was made to utilize liquid nitrogen at  $-320^{\circ}$  at pressures up to 60,000 psi to provide an aggressive, yet safe, cleaning application.

Decontamination was accomplished by removing at least 1/8 inch of the surface and safely collecting the material in a vacuum system for disposal. One of the unique benefits of the technology was that it did not create a secondary waste stream.

A team visited the technology owners' shop to evaluate the operation of the liquid nitrogen technology prior to its implementation. A base model was leased, which included an operation skid, shroud, and decontamination wand.

The site workers designed several mockups which were used to train employees on the system. This extensive use of mock-ups led to several improvements in safety, work controls and equipment. This included a secondary shroud which was built in-house to provide additional worker protection and control.

An in-cell mast climber was used to allow employees to safely access all areas of the 57-foot-tall cell, which resembled an elevator shaft. In addition to the primary and secondary shrouds of the liquid nitrogen decontamination system, portable ventilation units were used to provide appropriate air exchanges to ensure a safe work environment.

Even with all of these controls, operators were still required to perform work in air-supplied bubble suits with air-supplied respirators.

Work plans were developed using previous site experience and corporate experience, industry best practices and lessons learned from similar deactivation projects to anticipate and mitigate potential adverse events. This also included work controls to reduce radiation exposure to workers during deactivation and waste packaging.

"This accomplishment demonstrates the importance that planning, work control, and worker feedback have when it comes to high-hazard work activities," said Tom Dogal, facility disposition manager. "Working closely with employees, management, and DOE, feedback was used to further improve processes and safety controls during the deactivation. It was this employee engagement that led to a safe, compliant and successful outcome."