

ALARA success achieved at WRAP

Charlie Taylor, FH

A major ALARA (As Low As Reasonably Achievable) success has been documented at the Waste Receiving and Processing facility with the graduated reduction of radiological controls and procedures required in processing drums of transuranic, or TRU, waste.

A team of WRAP employees in management, operations, radiological control and engineering developed new methods that save time and decrease the burden of wearing personal protective equipment.



TRU waste at WRAP

Transuranic waste consists of ordinary-looking trash contaminated with radioactive material containing radionuclides with an atomic number greater than that of uranium. Since 1970, suspect TRU and mixed-TRU waste containers have been separated from other waste and stored above ground or buried in shallow trenches to be retrieved at a later date.

WRAP went operational in 1999 as the major unit working toward removal of TRU waste from Hanford. Transuranic waste is usually received from the Central Waste Complex and undergoes a stringent certification process that includes radioassay and other analysis.

TRU waste drums that do not meet the acceptance criteria for final disposal require repackaging. If a TRU drum requires repackaging, this operation is completed in the TRU glovebox enclosures located in the process area of WRAP.

The contents are removed, the noncompliant condition is corrected and the material is repackaged in a "one-trip drum," so named because it is not designed for reuse. Only drums that meet the certification standards are shipped to the Waste Isolation Pilot Plant outside Carlsbad, N.M., for disposal.

In the older process, as the one-trip drums were readied for exit from the glovebox, respiratory protection was required for the entire room known as the process area. The drums were disconnected from the glovebox and the drum and exit port seal areas were decontaminated. This was labor-intensive, and the use of respiratory protection made it physically taxing.

Early in the operation of the gloveboxes, a ventilation collar was fabricated and attached to the box at the drum exit ports to reduce the potential for airborne releases. Surveys, monitoring and sample analysis took enough time that the removal of two drums was a full-day evolution.

Last December, a team made up of bargaining-unit and exempt representatives of operations, radiological control, engineering and maintenance finalized a process that, when implemented in four phases, would result in fewer controls and a more efficient process.

Continued on page 12.

ALARA success achieved at WRAP, cont.

Phase one was to continue to perform the exits as before, but with the use of an improved ventilation collar that featured better coverage and a higher flow rate than the previous fixture.

Additional radiation protection information was gathered with the use of breathing zone air samplers and modified contamination surveys. Also, the radiological controls continued to include respirators for all employees in the process-area room.

The effectiveness of the new ventilation fixture was demonstrated. Then, using detailed information from breathing-zone air sampling, the phase-two controls reduced respirator requirements to a posted zone called the Airborne Radioactivity Area, or ARA, around the exit conveyors and the glovebox exit ports.

The third phase discontinued the practice of decontaminating the exit ports and seal areas after each drum exit. This was the activity with the greatest potential risk to personnel from radioactive contamination. Survey information was gathered to ensure drum exits could be performed without the undue risk of spreading contamination to the surrounding Radiological Buffer Area, or RBA.

Once sufficient operational history was gathered on the new set of controls, phase four was implemented. These new controls allow employees to perform the drum exit operation without wearing respirators. To ensure contamination levels are maintained with ALARA in mind, phase-three controls are used to perform a set of drum exits and the exit port and seal area are decontaminated after four sets of drum exits, consisting of eight drums.

The WRAP facility has been able to double its TRU drum processing capability by performing decontamination only periodically or when necessary, installing an improved ventilation fixture, and reducing radiological controls based on the lower risk of spreading radioactive material. Further improvements should allow up to 10 drums a week to be processed.

The process changes have not resulted in a spread of radioactive contamination to the surrounding RBA. The exit activity now requires fewer resources, and the reduction of the required personal protective equipment results in less physical stress for the workers performing the activity. The team effort made this phased reduction of controls a real ALARA success story. ♦