

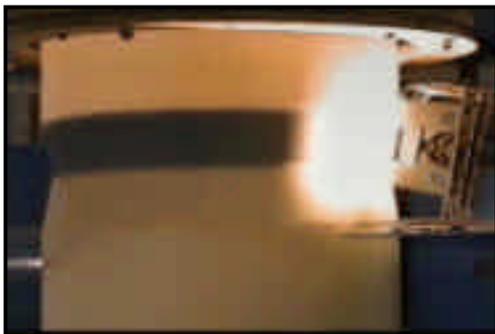


## UPCOMING ROBOTICS DEPLOYMENT: Automation of Waste Verification and Segregation Process

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**The Problem:** All mixed waste within the Department of Energy complex will be either treated or sent to a waste repository such as the Waste Isolation Pilot Plant (WIPP). Whether treated or placed in a waste repository, the contents of the waste containers must meet stringent Waste Acceptance Criteria (WAC). These criteria may necessitate removal of items that are noncompliant. Additionally, the methods for characterizing the waste container contents must themselves be verified. Characterization processes such as real-time radiography must be validated by physically unpacking the container and comparing actual contents to the predicted contents.

**The Technology:** The Handling and Segregating System (HANDSS-55) is a collaborative effort between the Transuranic and Mixed Waste Focus Area (TMFA) and Robotics Crosscutting Program. HANDSS-55 will provide verification and repackaging of mixed TRU wastes for shipment to WIPP. HANDSS-55 comprises four modules: (1) the Waste Sorting Module, (2) the TRU Waste Repackaging Module, (3) the Process Waste Reduction Module, and (4) the System Integration and Control Module. The Waste Sorting Module includes the automated drum and liner opener, the sorting table, and the vision system for



removal of noncompliant items. The TRU Waste Repackaging Module seals the compliant waste into polyethylene canisters using infrared welding and maintains a contamination barrier between the glovebox and the environment. The Process Waste Reduction Module shreds the old drum and high-density polyethylene liner. The System Integration and Control Module includes both the software and hardware that integrate the modules and provides overall system control. The modules will be transferred to the Western Environmental Technology Office in Butte, Montana, for system integration and demonstration.

**The Deployment:** The HANDSS-55 System will be deployed at the Savannah River Site (SRS) for the visual inspection, sorting, segregating, and repackaging of  $^{239}\text{Pu}$  and  $^{238}\text{Pu}$  contaminated waste, and, potentially, remote handled wastes currently stored in 55- and 83-gallon drums. The final designs for the modules will be completed in FY 2001, and development of the modules will proceed through FY 2002. Individual module testing will start in FY 2002, with integrated system demonstration completed in FY 2003. Setup and transfer of the HANDSS-55 to SRS will be during FY 2004.

**The Benefit:** No baseline capability exists to sort, segregate, remove prohibited items, and repack  $^{239}\text{Pu}$  and  $^{238}\text{Pu}$  waste or any remotely handled waste. The HANDSS-55 technology is required to process legacy waste to meet WIPP/WAC requirements at SRS. SRS Estimates life cycle cost reduction of at least \$16 million for timely transfer of waste to WIPP.

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