

A real HANDSS on experience

DOE's Idaho National Engineering and Environmental Laboratory (INEEL) is demonstrating a new technology that automates radioactive and hazardous waste sorting and integrates other waste handling functions. This new technology uses state-of-the-art imaging to digitally identify and locate suspicious items, then communicates with a robot to remotely retrieve them.

This INEEL-developed waste sorting module is one of several modules being developed to make up the "Handling and Segregating System for 55-gallon drums" or HANDSS-55. The HANDSS-55 imaging system, that is part

of the sorting module, develops a picture or contour map of the dimensions of items to be removed each time a new drum is opened. Then it adjusts its remote gripper to accommodate the item being removed. This system is unlike other robotic



Miles Walton demonstrates HANDSS-55's capability to remove waste items using the automated and remote sorting equipment developed at the INEEL.

systems that are pre-programmed to perform routine functions in structured environments.

The HANDSS-55 system consists of four modules—sorting, volume reduction, repackaging and system integration and control. The INEEL-developed sorting module automatically opens 55-gallon drums and removes non-compliant items. The volume reduction module shreds the original drum and places it into a 55-gallon canister. Another module repackages acceptable wastes and places them into polyethylene canisters using a bagless transfer method. And, the system integration and control module allows all three modules to function as one seamless system. All these modules will be tested and demonstrated together before being deployed and used at the Savannah River Site in May of 2005.

DOE's TRU and Mixed Waste Focus Area directs the design and development of these modules. The INEEL coordinates the effort and is supported by the Savannah River Technologies Center. HANDSS-55 is funded through DOE's Office of Science and Technology.

Submitted by DOE's Idaho National Engineering and Environmental Laboratory

PNNL RESEARCHER TAPS FUNGI'S POTENTIAL



Dr. Linda Lasure

At a time in the field of science when most research on fungal strains is focused on eliminating organisms—the culprits of several complex, often deadly diseases—Dr. Linda Lasure, staff scientist at DOE's Pacific Northwest National Laboratory, is conducting research that manipulates and fosters growth of certain fungal species

Only a handful of research institutions around the world are working in fungal biotechnology, and none of those are working for the purpose of developing new biomass-to-chemicals processes, making PNNL's research truly unique.

"The filamentous fungi are everywhere; especially where there are woody plants," Lasure said. "We also have many sources of renewable biomass. By subjecting biomass to hungry, specialized fungi and applying new processing techniques, we can successfully convert biomass into intermediates important in manufacturing chemicals and consumer products, while reducing our reliance on foreign oil. The work is exciting and very rewarding," she said.

Lasure, a recognized national and international leader in the field of fungal genetics, directs the biotechnology component of PNNL's Bio-Based Products Initiative, and is focused on extending bioprocessing capabilities while continuing her work in microbial genomics.

"I was drawn to PNNL to conduct research because there is a firm commitment for biologists and chemists to work together to address issues, develop new knowledge and apply that information to convert renewable biomass into useful things," said Lasure. "We're creating a leading-edge capability in filamentous fungi, a largely untapped resource essential to recycling biomass in nature," she said. The research effort includes pursuing techniques for controlling fungal growth, identifying and exploiting novel fungi, and creating new processes via systems biology and proteomics.

Lasure joined PNNL in November 2000, and has more than 30 years of experience in fundamental biological research.

Submitted by DOE's Pacific Northwest National Laboratory