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Changing the World's Energy Future

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Abstract:

DOE manages over 300 types of SNF, most of which are located at the INL site. The Idaho Cleanup Project and INL are collaborating on the Road-Ready Capability Demonstration Project, which will develop and demonstrate the designs, technology, processes, and regulatory framework for packaging DOE SNF for “road-ready dry storage”. Road-ready dry storage is a SNF management concept in which SNF is packaged into dry, sealed canisters that are then placed in onsite storage in anticipation of later transp.

In support of establishing a large-scale road-ready dry storage program at the INL site, the demonstration will package a select amount of DOE-managed SNF into DOE Standard Canisters. The closure process for the DOE Standard Canisters will include fuel and basket loading, welding, inspection, leak testing, and, if needed, repair. As a follow-up to previous discussions on the design of the DOE Closure Leak Test Assembly, this report describes recent fabrication and testing efforts performed at INL.

DOE Standard Canisters are sealed by two sequential gas tungsten arc welds, both of which are performed by remotely operated and semi-autonomous welding systems. The first weld is a circumferential pipe weld that completes the assembly of the canister body and lid assembly. The second and final closure weld connects the vent plug to the vent port. After the second weld is performed on the vent port, the welds are helium leak tested using an evacuated envelope technique. In addition to the commercially available vacuum and leak detector systems, the DOE Standard Canister Closure Leak Test Assembly was designed for both remote and manual operation. This report describes the fabrication and performance testing associated with the inside-out technique.

INL staff designed and tested systems to accomplish these tasks. Hardware fabrication occurred at INL facilities. Forthcoming work will cover such areas as design optimization, integration with existing systems, and implementation in demonstration operations.