

*INL's work for the National Spent Nuclear Fuel Program has become the DOE's model for safely packaging spent nuclear fuel for storage, transport, and disposal.*



## Standardized Spent Nuclear Fuel Canister

Throughout Department of Energy complexes and the commercial nuclear industry, a need exists to increase safety and mitigate potential impacts of handling spent nuclear fuel and hazardous/radioactive waste in case of unforeseen events. The Idaho National Laboratory (INL) has developed a unique type of canister to safely handle, store, and transport spent nuclear fuels and hazardous radioactive waste. Canisters can be adapted to various needs by using different liners and materials.

### Overview

The U.S. nuclear industry and its associated infrastructure continue to generate spent nuclear fuels and hazardous/radioactive waste that must be stored prior to shipment to an authorized disposal facility. Without engineered protection during interim storage or transportation to disposal sites, an increased risk exists that these materials could be released to the environment during an accident or intentional action. Such events could pose threats to people and the surrounding environment and produce severe adverse economic consequences.

### INL Solutions

To safely contain spent nuclear fuel during interim storage and transportation, and to facilitate eventual repository disposal, the INL developed the standardized spent nuclear fuel canister for the Department of Energy. This canister was designed to minimize fuel handling during interim storage, transportation, and final disposal operations. (See illustration on reverse page.)

To maximize the integrity and safety of a canister during a potential drop or sudden impact, the canister design incorporates an energy-absorbing

skirt. This feature deforms on impact to protect the canister heads and shell that enclose the radioactive material or waste. This durable, robust canister design can withstand operational loads and accidental drops without breaching or allowing contents to escape. The overall integrity of the canister was demonstrated through a variety of drop tests at varying impact angles, followed by helium leak testing. Tests included drops from the 30 feet onto a flat unyielding surface as well as drops onto steel posts to simulate puncture hazards.

*Continued on back*

science



**For more information**

**Technical Contacts:**

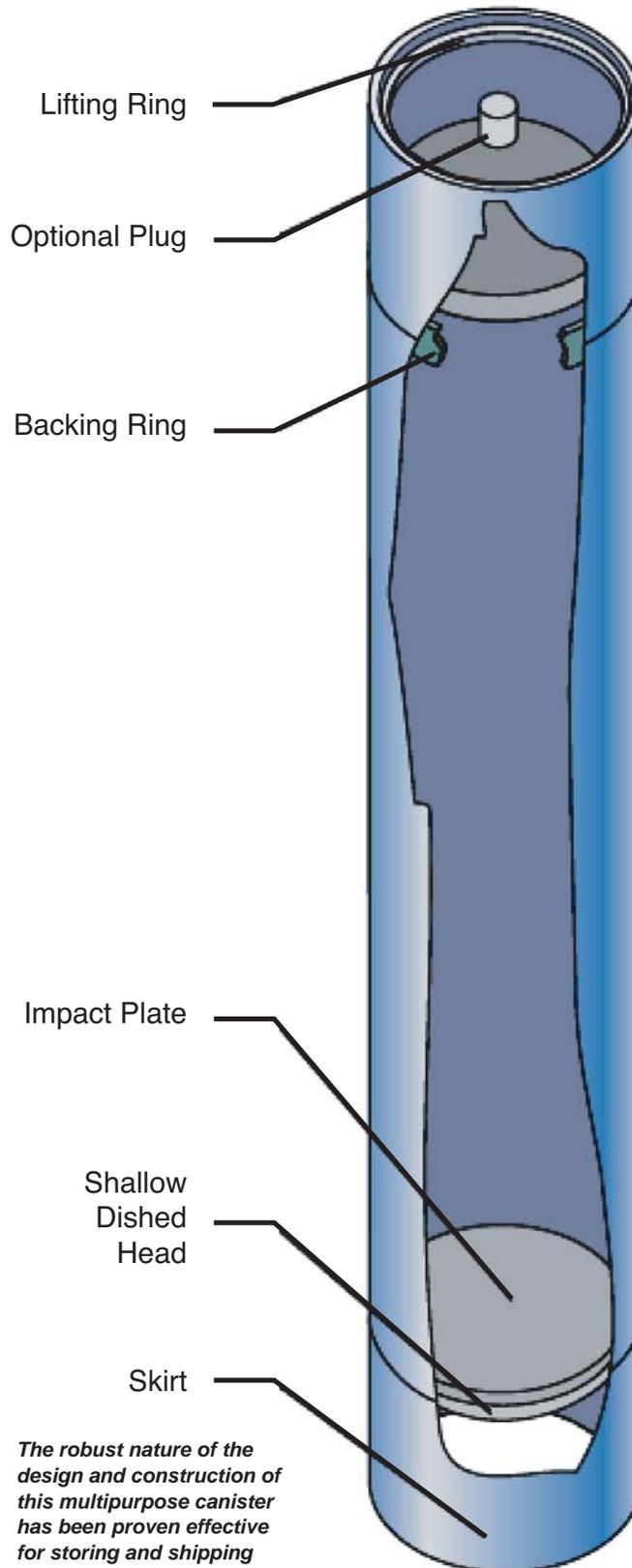
**D. Keith Morton**  
 (208) 526-1274  
 Fax (208) 526-4311  
 Dana.Morton@inl.gov

**Spencer Snow**  
 (208) 526-8510  
 Fax (208) 526-4311  
 Spencer.Snow@inl.gov

**Management Contact:**

**Sandra Birk**  
 (208) 526-1866  
 Sandra.Birk@inl.gov

INL is a U.S. Department of Energy  
 national laboratory operated by  
 Battelle Energy Alliance



*The robust nature of the design and construction of this multipurpose canister has been proven effective for storing and shipping spent nuclear fuel and can be adapted to handle hazardous materials.*

The testing results demonstrated that the canisters were “leaktight” with leak rates less than  $10^{-7}$  standard cubic centimeters/second.

**Business Products**

This canister was designed to be welded, but various closure systems including threaded nozzles or bolted lids with seals can be incorporated, depending on the material or waste to be inserted.

**Benefits**

Benefits of the canister include:

- Proven, robust design
- No-breach capability demonstrated for severe accidental drops
- Engineering and testing capabilities available to demonstrate product functionality
- Easily adaptable design for customer needs and design specifications.

**Customer Service**

INL’s Science and Engineering Division have expertise to fulfill customer-specific requests by providing engineering and testing to develop and demonstrate acceptable variation in size, materials, access, closure or handling.