

Benefits of ARG-US "Smart Drum" Technology

ARG-US RFID
enhances package
safety and security
while reducing the
need for manned
surveillance, resulting
in efficient operations
and cost savings.



▲
Smart Drum
24/7 monitoring & tracking
with ARG-US RFID

Contact:

Yung Y. Liu
Senior Nuclear Engineer,
Section Manager
Argonne National Laboratory
yyliau@anl.gov
630.252.5127

Paul Blanton
Program Manager
Savannah River National Laboratory
paul.blanton@srnl.doe.gov
803.725.3738



EM Environmental Management
safety • performance • cleanup • closure
DOE PACKAGING CERTIFICATION PROGRAM

Argonne National Laboratory is a U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC. dis_SmartDrumBroch_072014rc

Smart Drum Technology



Overview

Coupled with and enhanced by Argonne National Laboratory's patented ARG-US radio frequency identification (RFID) monitoring and tracking technology, a tagged 9979 drum-type packaging designed and patented by SRNL becomes a "Smart Drum." The ARG-US RFID system and the 9979 drums are available commercially through our licensed partners Evigia Systems and Paragon D&E, respectively.

Benefits of ARG-US RFID "Smart Drum" Technology

ARG-US RFID enhances package safety and security while reducing the need for manned surveillance, resulting in efficient operations and cost savings.

ARG-US RFID Tags

- ▶ A suite of modular sensors monitors key parameters – standard stock sensors includes those for monitoring temperature, humidity, seal (tamper-indicating), and shock; specialty sensors include those for gamma and neutron radiation, which can be incorporated according to the deployment environment.
- ▶ Patented battery management system ensures long-life operation — up to 10 years without battery replacement.
- ▶ On-board memory stores content manifest, event history, and sensor data.
- ▶ Any violation of pre-set sensor thresholds prompts an instantaneous alert/alarm to system operator.
- ▶ Tags enable continuous monitoring via local network and secure website.

▼ ARG-US Tag



Gamma Dosimeter (top) and Neutron Detector

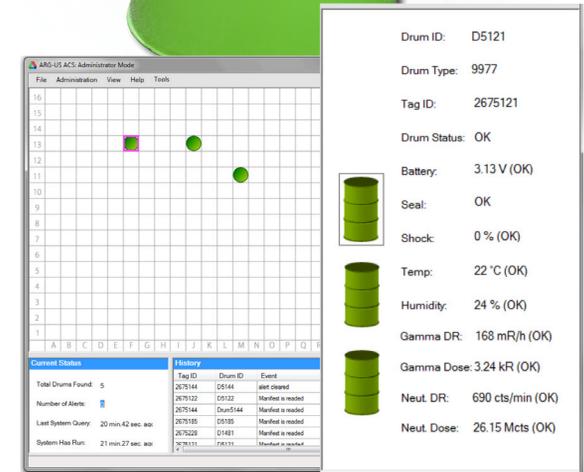
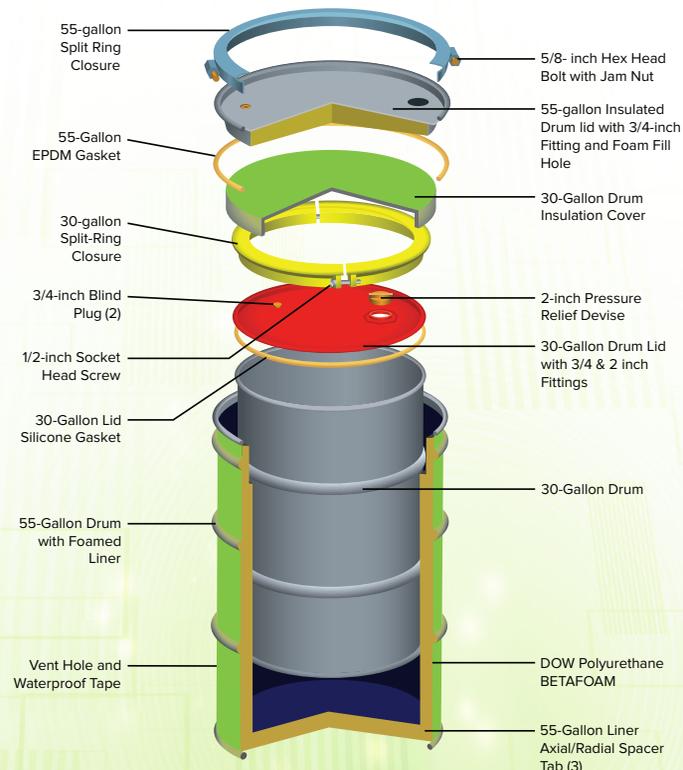
Motherboard and Antenna

10-year Battery

The 9979 Package

The 9979 package is a robust drum designed and certified by the U.S. Department of Energy for the packaging and shipment of Type A quantities of fissile material.

- ▶ The package consists of a 55-gallon overpack drum enclosing a 30-gallon drum that serves as the confinement boundary for the package's radioactive contents.
- ▶ A robust split-ring closure device fabricated from 16-gauge steel is used to close the 30-gallon drum and the 55-gallon overpack drum.



▲ SmartDrum technology monitoring software – ARG-US OnSite

Summary

- ▶ With attachment of an ARG-US RFID tag, the 9979 package becomes a Smart Drum.
- ▶ Continuous monitoring and tracking of package via sensors reduces exposure of personnel to radiation and the need for manned surveillance.
- ▶ Robust alert system transmits alarms instantaneously when any sensor threshold is violated.
- ▶ Coupled with ARG-US TransPort and/or CommBox (patent pending), the "Smart Drum" technology provides chain of custody and end-to-end coverage of "high-risk" materials during storage and transportation.