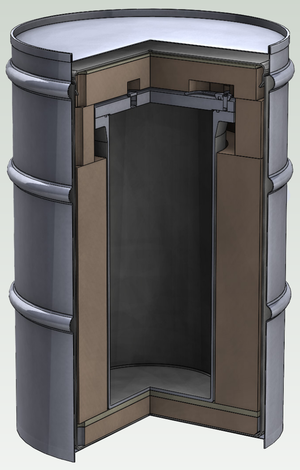
U.S. DEPARTMENT OF ENERGY

Sandia National Laboratories

SAND2015-8233D

# Pipe Overpack Container Fire Testing



The Pipe Overpack Container (POC) was developed at Rocky Flats to transport plutonium residues (waste containing higher levels of plutonium than standard TRU waste) to WIPP for disposal. The pipe overpack container was designed to maintain separation of fissile material (which allowed the total fissile material loading of the TRUPACT-II container to go from 325 grams to 2.8 kg) and to provide shielding from radiation.

## PREVIOUS TESTING

**POCs were used for staging material to be transported and were evaluated for protection against storage accidents. One test was a 30-minute engulfing fire.**

- Four POCs engulfed in the fire
- One 55-gallon drum outer package lid popped off due to internal pressure
- The O-ring seal of the pipe in this package failed due to ensuing high temperature
- This pipe could have released some of its contents

Before



POCs before Fire

After

POCs after fire

POCs fully engulfed in fire

## NEW TESTING

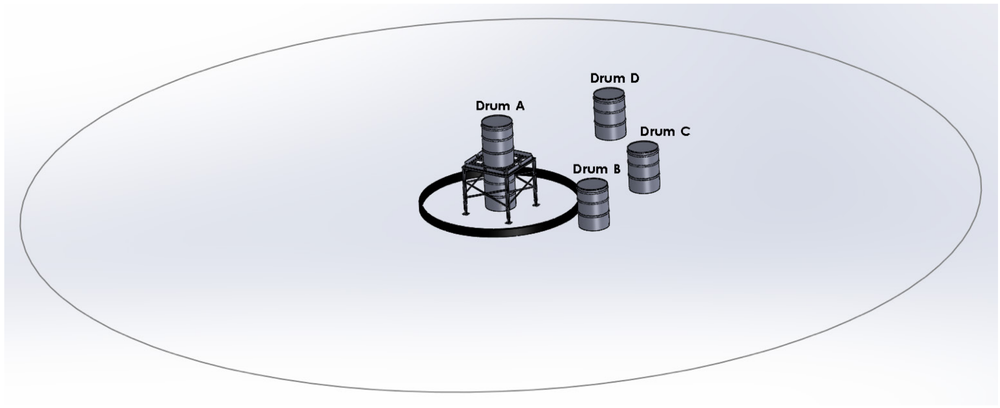
### The current testing will involve two phases

**In Phase I POCs with inert contents will be exposed to a 1-hour fire:**

- Conducted indoors (Sandia's FLAME Facility)
- One drum fully engulfed, three others at various distance from the fire
- Measure temperature of the drum surface, pipe surface, and contents

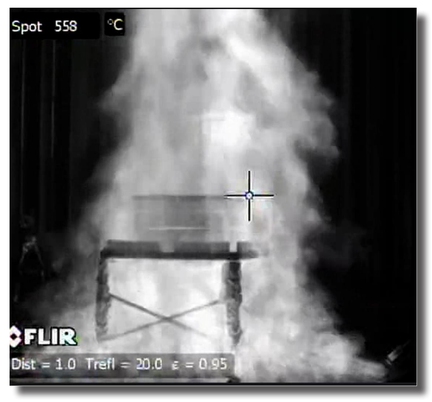
**In Phase II the temperature history from phase one will be applied to a bare pipe with simulated combustible contents:**

- Conducted by using radiant heat lamps in XTF
- Pressure inside pipe will be monitored
- Gas flow rates out of the pipe will be calculated
- The release fraction of radioactive material will be determined




New test setup


Indoor fire test




Infrared view of fire

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