

# Revision of 10 CFR 71.63 to Eliminate Double Containment Requirements for Plutonium Shipments



Western Governor's Association  
WIPP Transportation Advisory Group  
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# Discussion Topics

- Elimination of double containment requirements for plutonium shipments.
- Potential Impact on WIPP Packages.
- Status of TRUPACT-III application.

# Current Rule

## 10 CFR 71.63

- Requires Plutonium in excess of 20 curies to
  - be shipped in solid form.
  - be shipped in a package with “double containment.”
- Exempts non-dispersible forms of Plutonium from double containment (metals, metal alloys, reactor fuel elements, vitrified waste).
- Remains in effect until Oct. 1, 2004.

# “Double Containment” Means:

- Separate inner container within outer packaging.
- Inner container and outer packaging are evaluated as a single unit for both normal and accidents conditions.
- Release for both inner container and outer packaging limited to
  - For normal conditions --  $10^{-6} A_2$  per hour.
  - For accident conditions --  $A_2$  per week.

# Revised Rule

## 10 CFR 71.63

- Retains requirement that Plutonium in excess of 20 curies be shipped in solid form.
- Eliminates the requirement for “double containment.”
- Becomes effective on Oct. 1, 2004.

# Basis for Rule Change

## ■ Consistency of Safety Requirements

- Radionuclides of greater hazard do not require double containment.
- Plutonium shipments will still require Type B packages.

## ■ Compatibility with IAEA

- No comparable IAEA requirement.

## ■ Changing Needs

- Original rule based on uncertainties in shipping large numbers of liquid plutonium nitrate and powder packages to support reprocessing.

# Chronology

- Double Containment Rule – 1974.
- Initial TRUPACT- II Approval – August 1989.
- Petition for Rule Change from IEC dated 9/25/1997.
- Public Comment on Petition – July 1998.
- Part 71 Issues Paper and public workshops – 2000.
- Incorporated into Part 71 Rulemaking – April 2002.
- Public Comment on proposed Part 71 – July 2002.
- Final Part 71 Rule issued - Jan. 2004.
- Final Rule in Effect - October 1 , 2004.

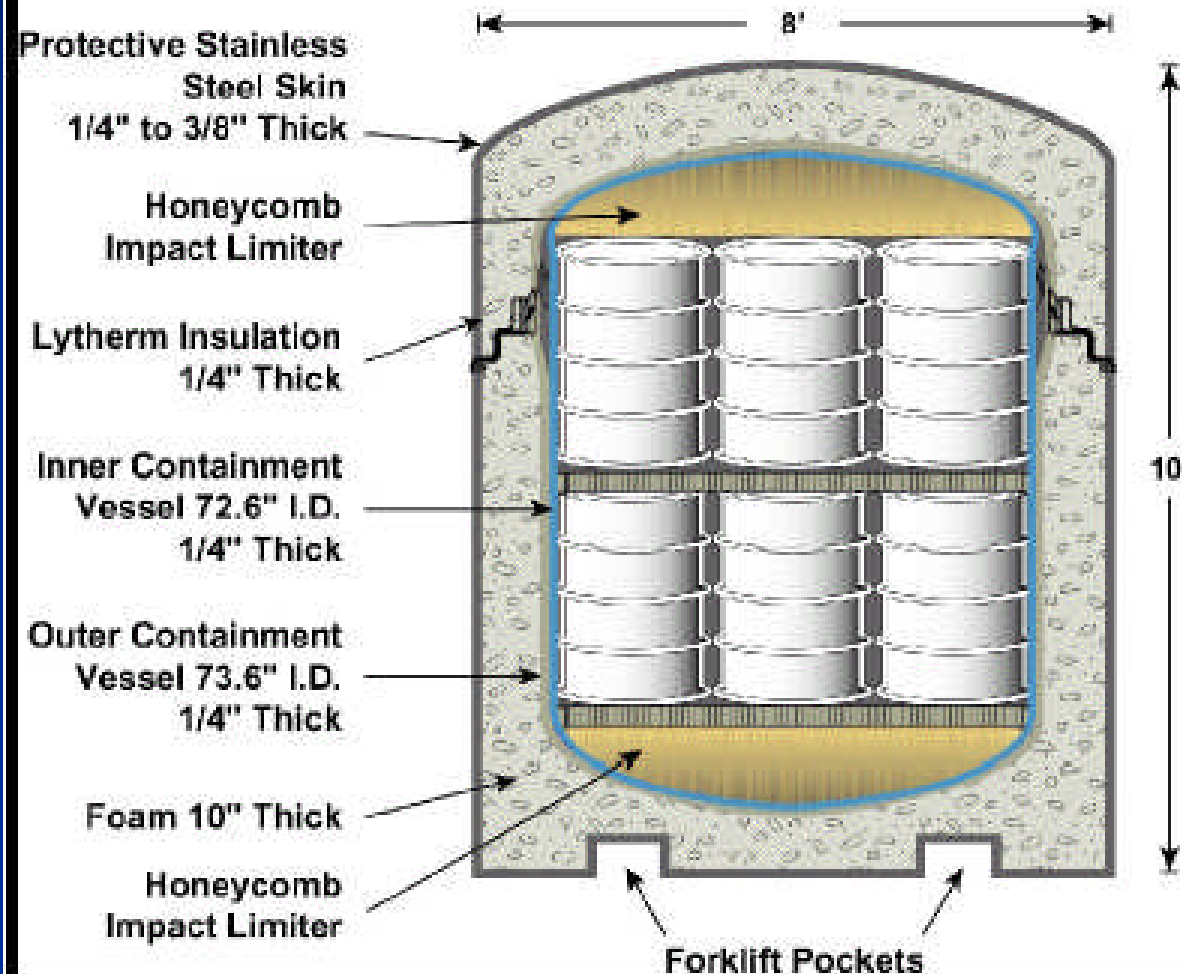
# Potential Impact on WIPP Packages

- TRUPACT- II
  - Double containment is integral part of design.
  - May permit shipper to eliminate leak testing of one set of O-rings.
  - Would need an NRC Approval to change.
- TRUPACT – III
  - NRC Certification would be based on Type B requirements – no double containment.

# TRUPACT- II



# TRUPACT-II



## Weight

12,705 lbs. empty

19,250 lbs. loaded

## Material

Stainless Steel

Polyurethane Foam

Ceramic Fiber

Insulation



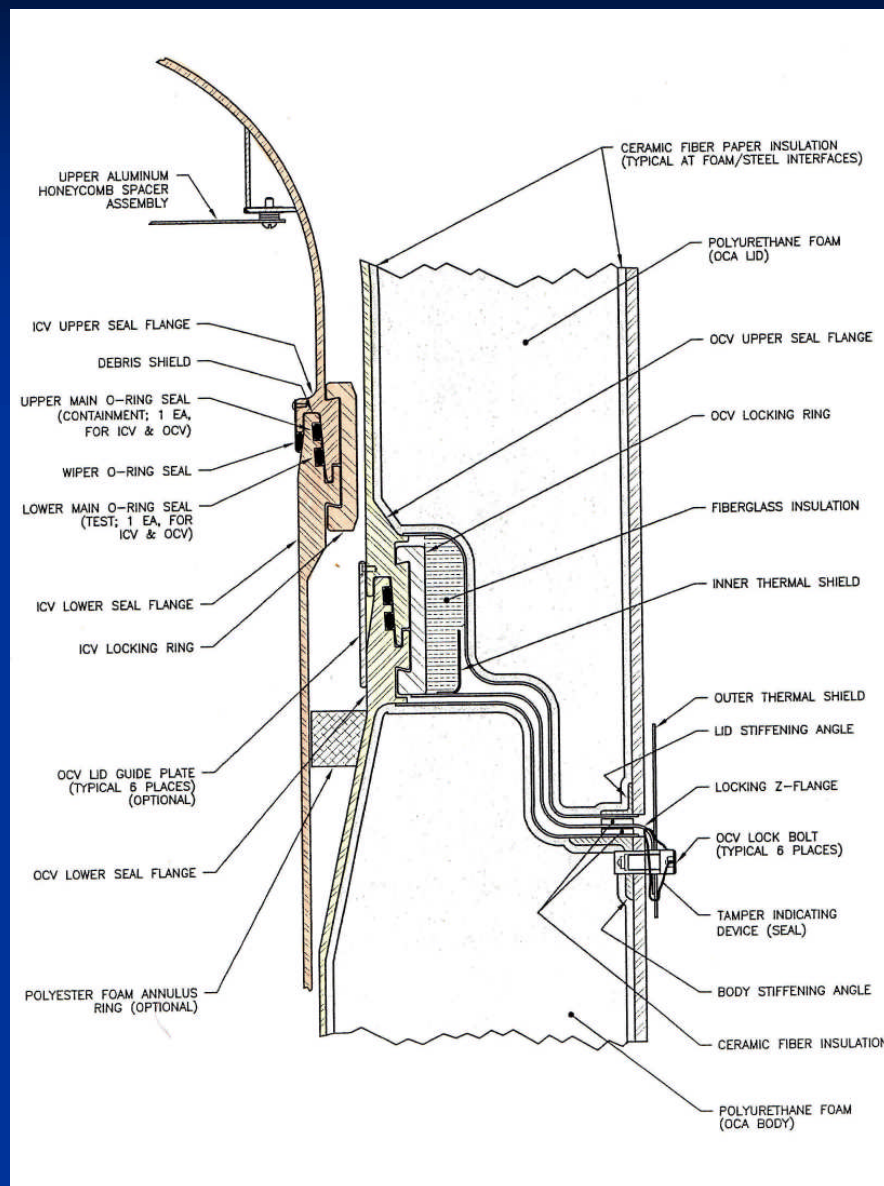
# TRUPACT-II Testing

**Nuclear Regulatory  
Commission-certified  
transportation package**

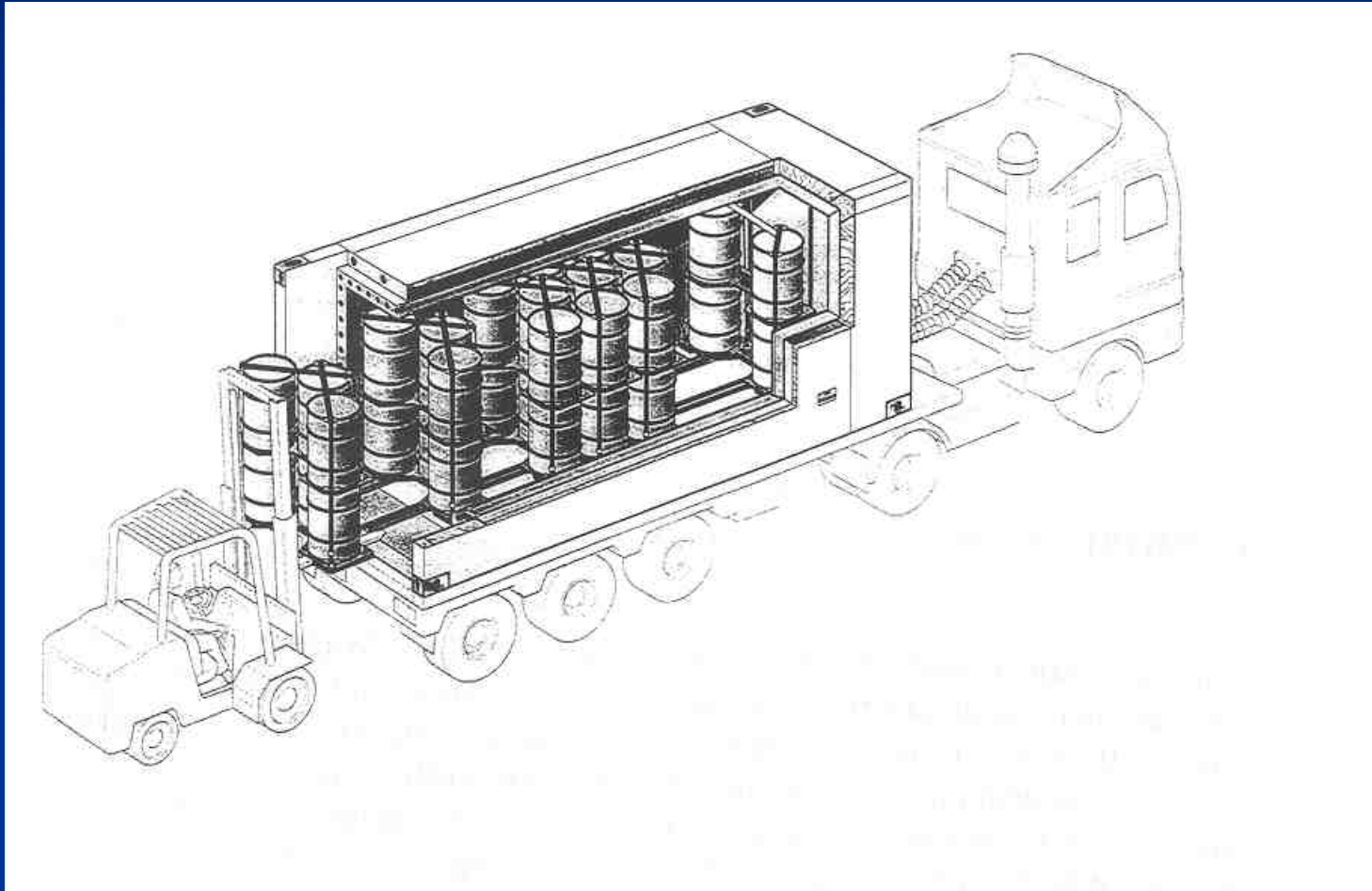


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# TRUPACT-II Packaging Closure Seal Region Details



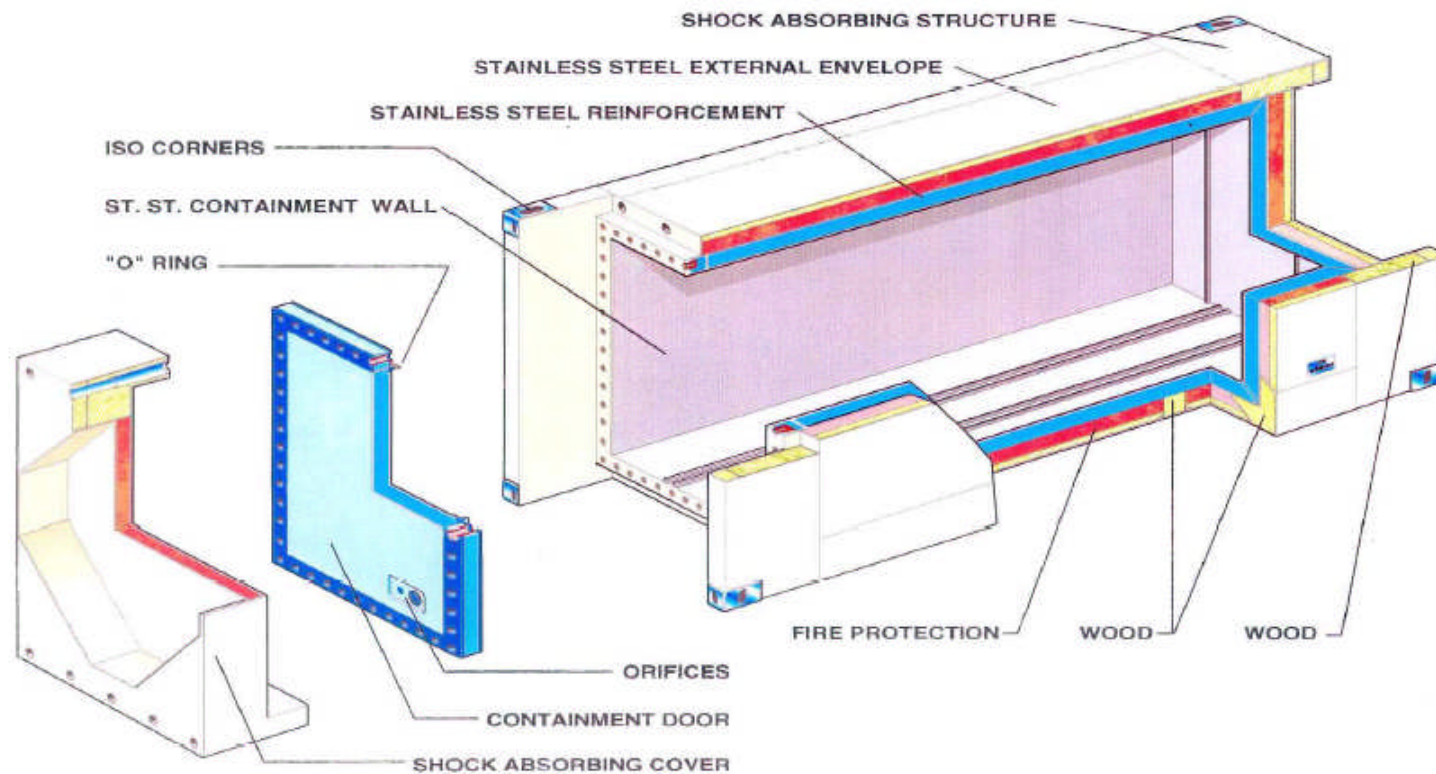
# TRUPACT-III



# TRUPACT-III

- Application submitted March 12, 2004.
- Package evaluation based on computer analysis and half-scale model testing.
- NRC review process to take approximately 12 months.
- Application and NRC review documents publicly available.
- Meetings with the applicant noticed and open to public.

# TRUPACT-III Transport Package



# TRUPACT-III

## Half Scale Impacts Tests

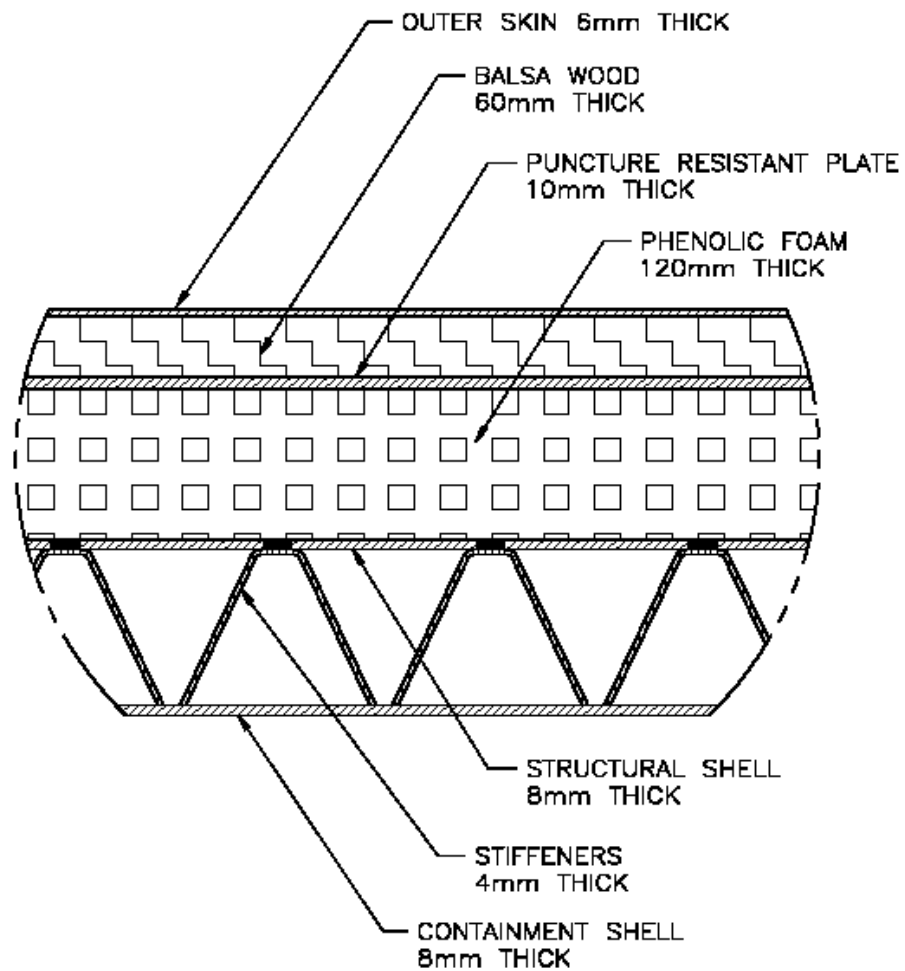


# Simple Comparison between TRUPACT-II and TRUPACT-III

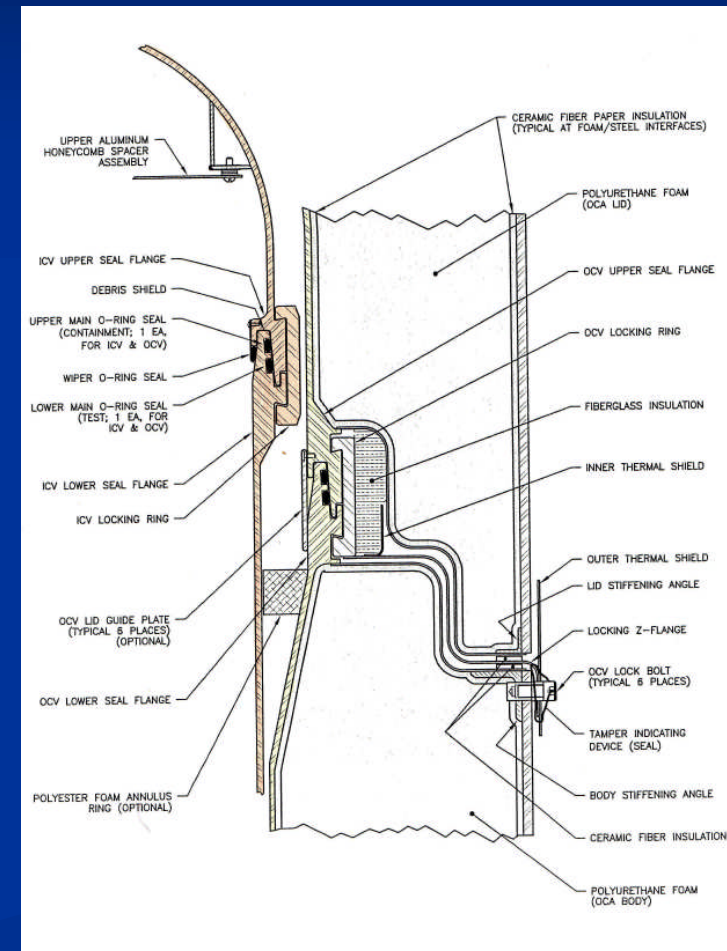
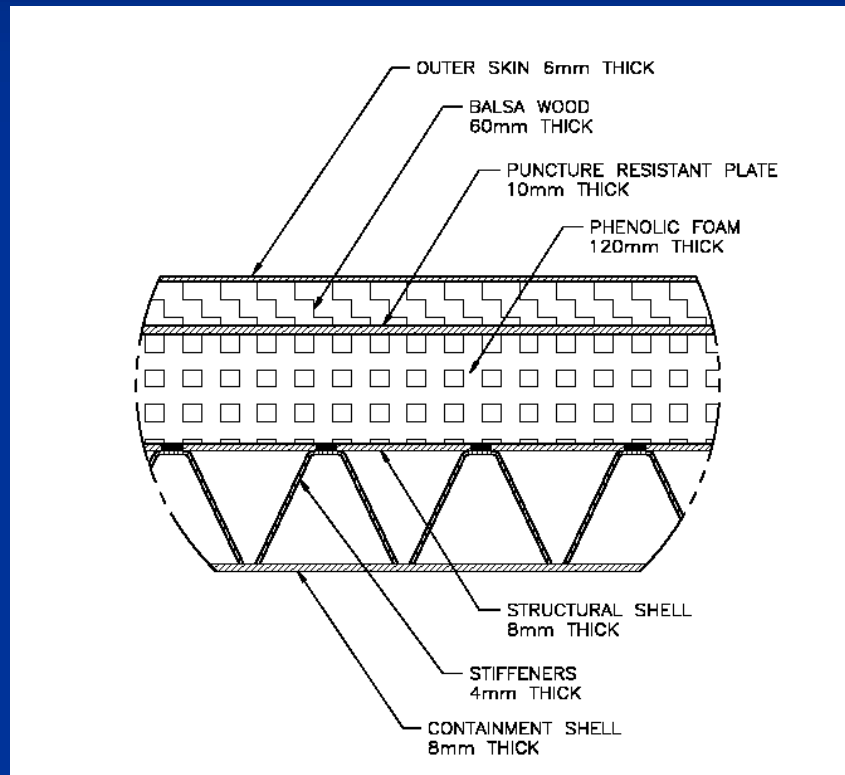
	TRUPACT-II	TRUPACT-III
Package Cross Section	Circular	Rectangular
Seal Type	Bore	Face
Weight, empty	12,700 lbs.	53,500 lbs.
Weight, loaded	19,250 lbs	66,000 lbs.
Payload	6,550 lbs.	12,500 lbs.

# TRUPACT-III

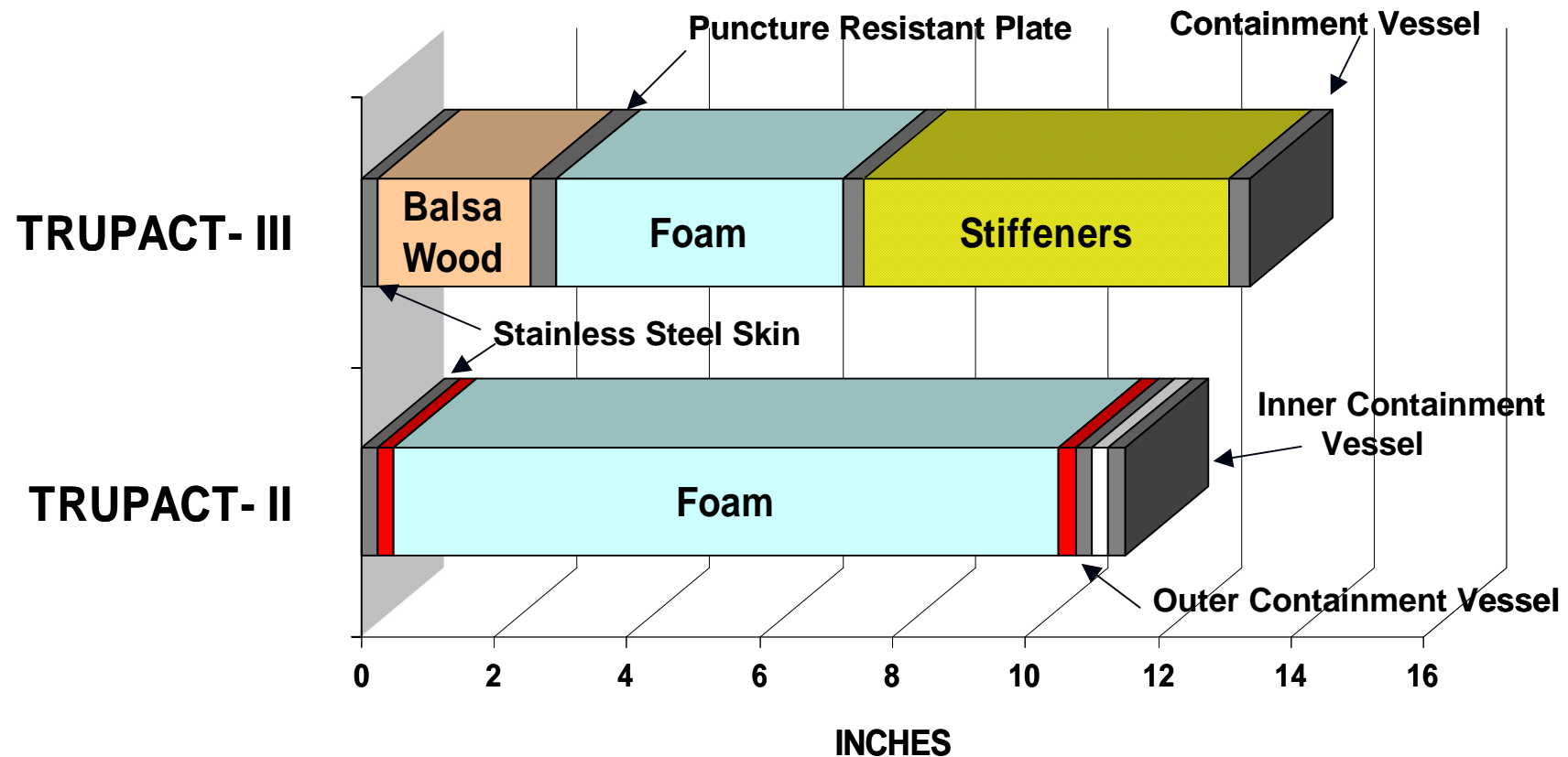
## Wall Cross Section



# Typical Wall Thicknesses for TRUPACT-II and TRUPACT-III

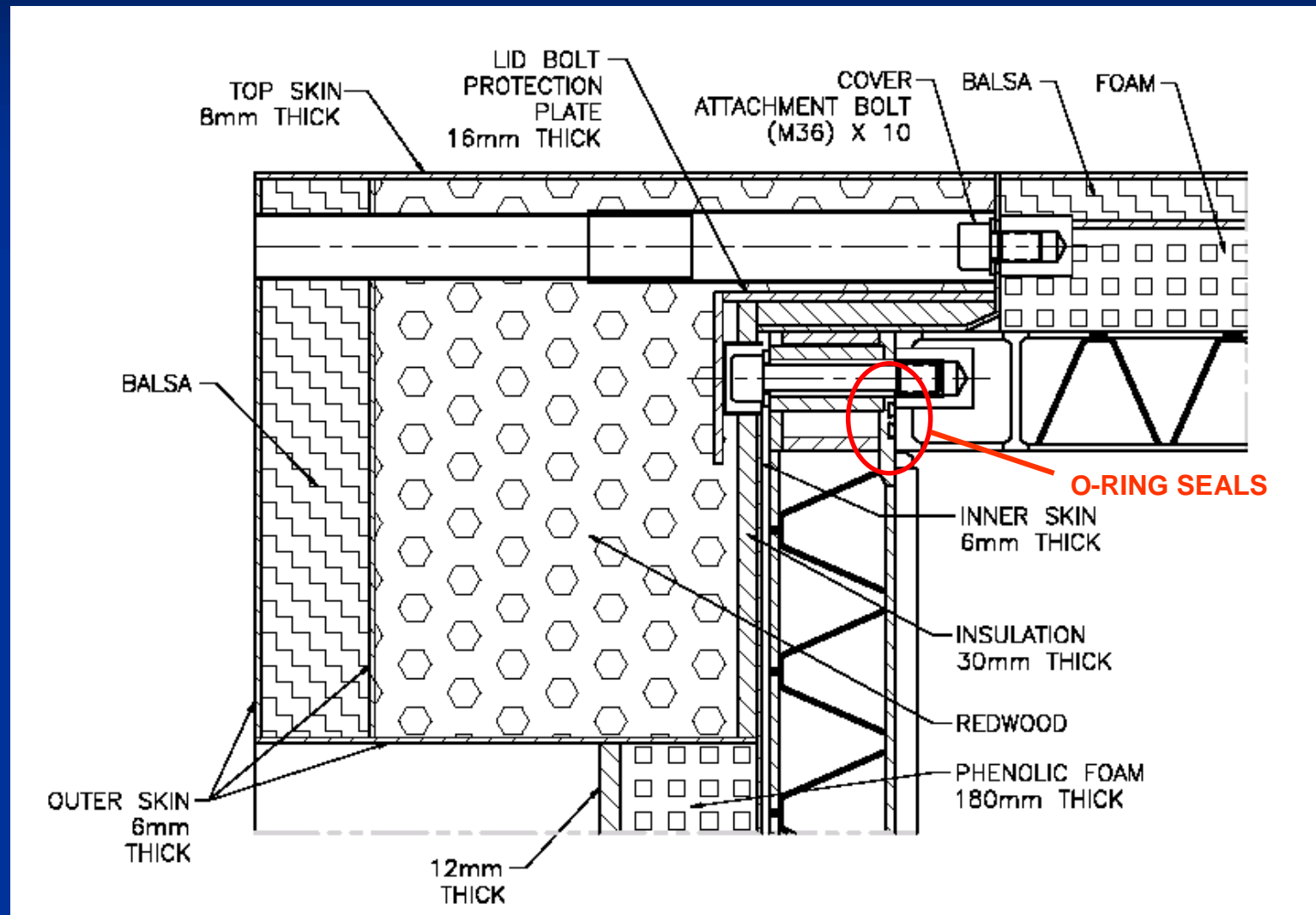


# Typical Wall Thicknesses for TRUPACT-II and TRUPACT-III

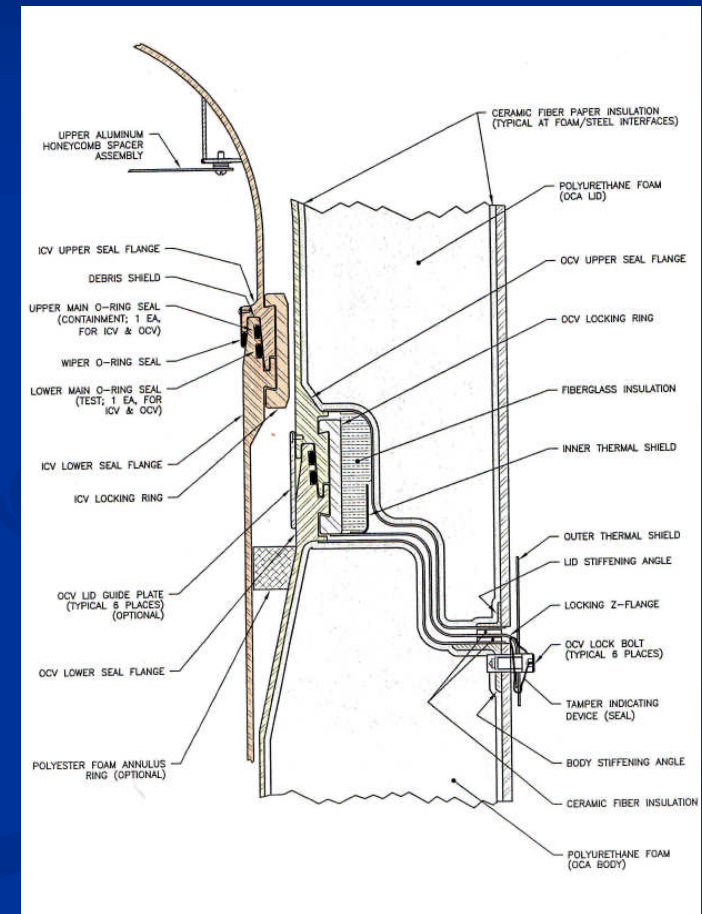
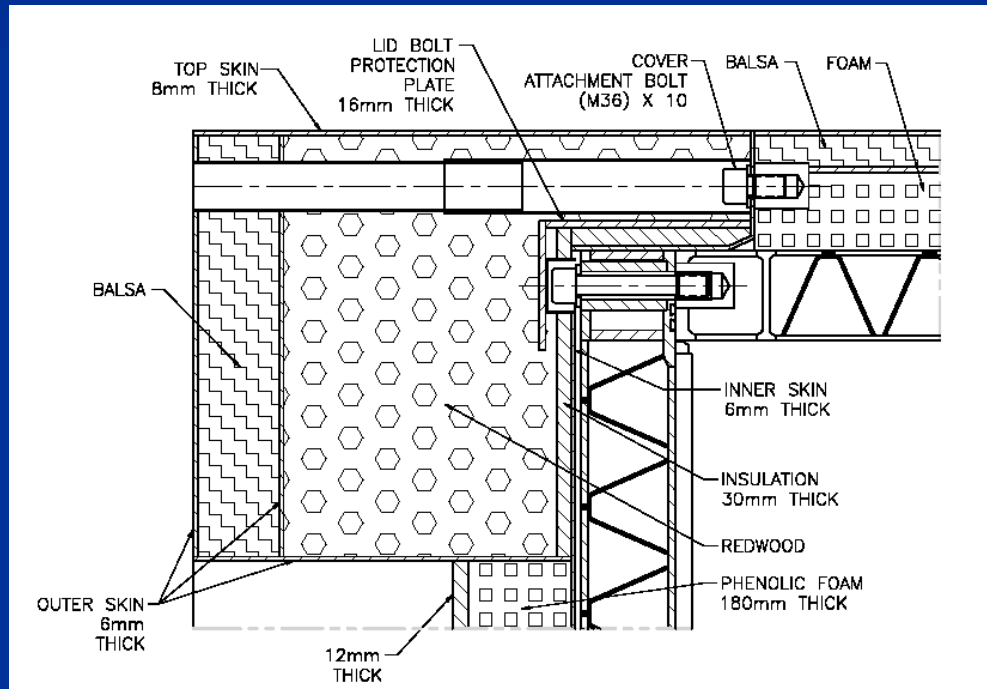


# TRUPACT-III

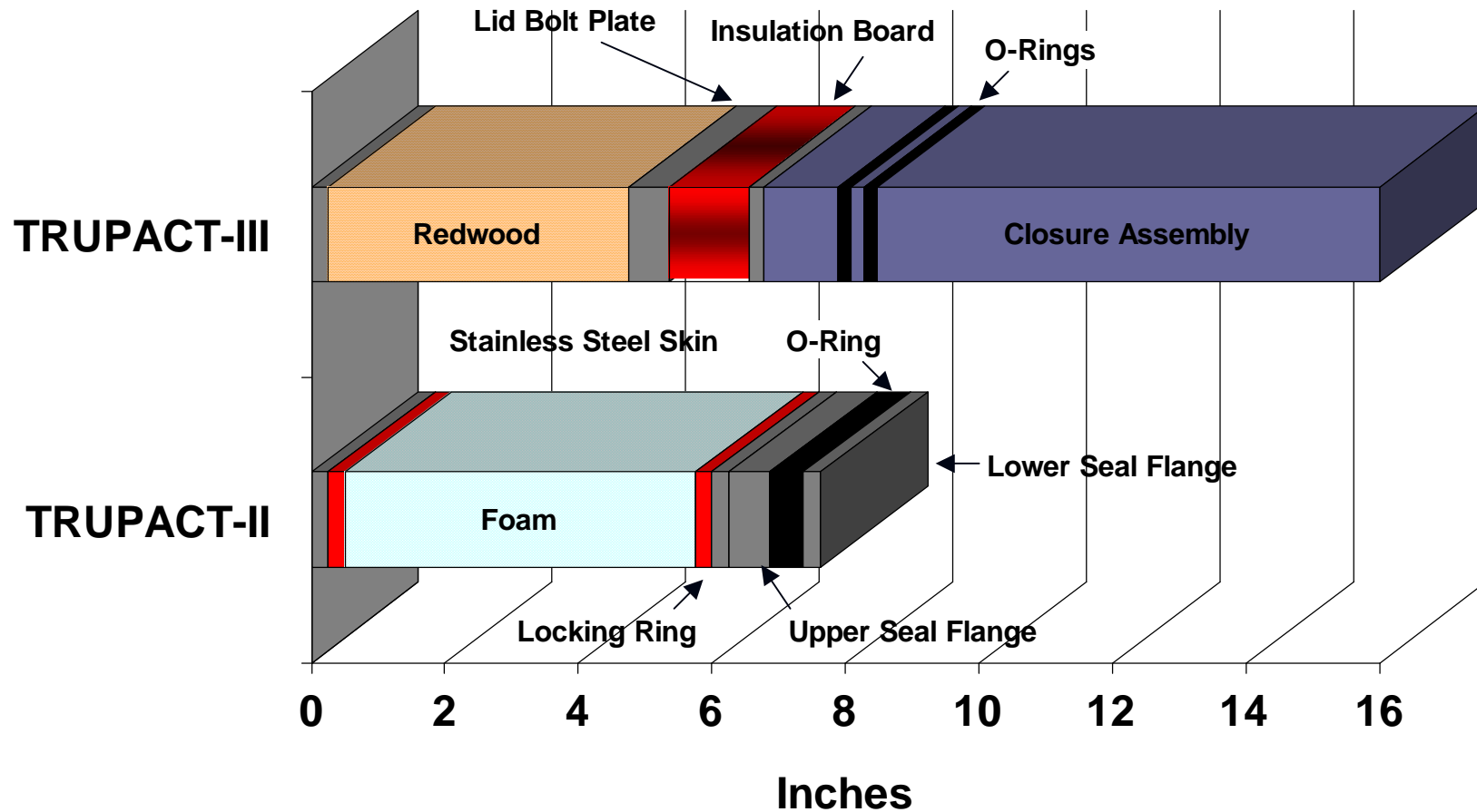
## Closure Seal and Impact Limiter



# Wall Thicknesses for TRUPACT-II and TRUPACT-III (Seal Region)



# Wall Thicknesses for TRUPACT-II and TRUPACT-III (Seal Region)



# Final Thoughts

- Elimination of double containment for Plutonium is based on consistency of safety standards, IAEA compatibility, and changing needs.
- Type B “single containment packages” provide a very high degree of safety against transportation accidents.