

MOBILE HOT CELL:

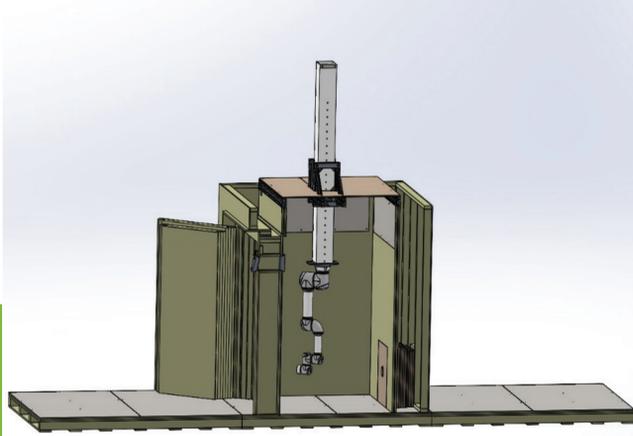
Idaho National Laboratories- Mobile Hot Cell Packaging, Fixturing, and Deployment Design

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(1) THE PROJECT:

A Hot Cell is a radiological containment device where radioactive materials can be manipulated safely
 Recovery of radioactive sources
 Robot Arm to manipulate radioactive sources, placed on the Z-Mast
 Mobile, international shipping
 Each shell weighs nearly 20,000 LBS



(2) PROJECT GOALS

- Purpose:**
- Safe delivery of the Mobile Hot Cell (MHC) to a variety of countries
 - Mobile Hot Cell can be used to permanently contain radiation sources, preventing bad actors from obtaining this radiation
- Deliverables:**
- Loading and unload procedure for all items
 - Develop method of tying down and securing all components
 - Develop physical protection for MHC
 - Create 3D model and 3D Printing of all items to develop and validate packing processes
 - Ensure loadout meets all shipping codes and international standards while providing relevant documentation

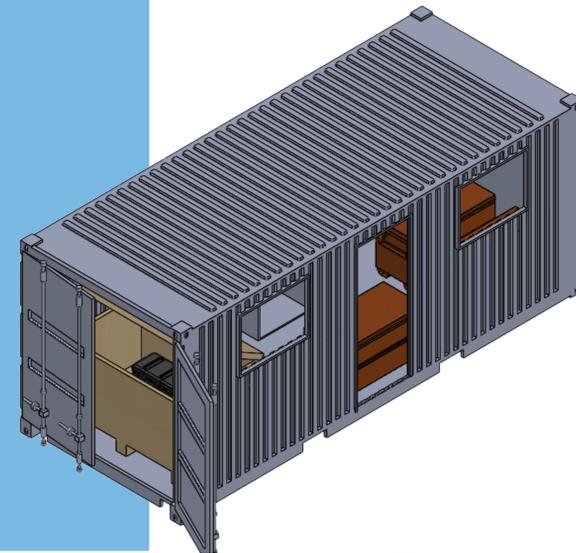
SECURING EQUIPMENT

- Fabric Webbing Ratchet Straps
- 2": 3,333 lbs, MBS 10,000 lbs.
- 4" 6,670 lbs, MBS: 20,000 lbs.
- Anchor Points
- Tiedown Rings
- WLL: 2,000 lbs.
- MBS: 6,000 lbs.
- Tiedown Bar
- Custom Designed Fixtures



(3) LOADING AND UNLOADING

- Components are placed to keep the center of mass centered
- Unloaded and loaded through a Telehandler crane
- Site layouts are setup to maximize efficiency as well as functionality in a variety of circumstances
- Many containers contain custom designed fixturing to support unique components
- Containers are designed to be shipped with minimal adjustment, and flexibility



(4) SECURING AND TIEDOWNS

- Containers have large wooden crates with smaller boxes
- Secure smaller components in foam boxes
- Flexibility allows these crates to be used on site
- Electricity
- Foldout workstation
- Internal Padding



(5) DOCUMENTATION AND PERFORMANCE REVIEW

Full analysis and justifications
 Technical report for workers with instructions a alternative plans
 Flexibility emphasized
 Deployment procedures across foregin countries with unsecured radtioactive sources
 Team members met or exceeded all client requieiments

Requirements	Target	Performance
All MHC components will fit within shipping containers	9' X 18' each	Components will fit inside containers
Number of shipping containers	7 containers	7 containers
Weight of components	52,000 lbs.	All containers are under 42,000 lbs.
Center of gravity of containers	4'3" X 4' (+- 6") (x-direction) (front of container) 4'3" X 10' (+-21") (side of container)	Within defined parameters
Deployment Time	6 hours	3.5 hours
Components withstand the accelerations of travel	.8g-1.6g	.6g-2g

