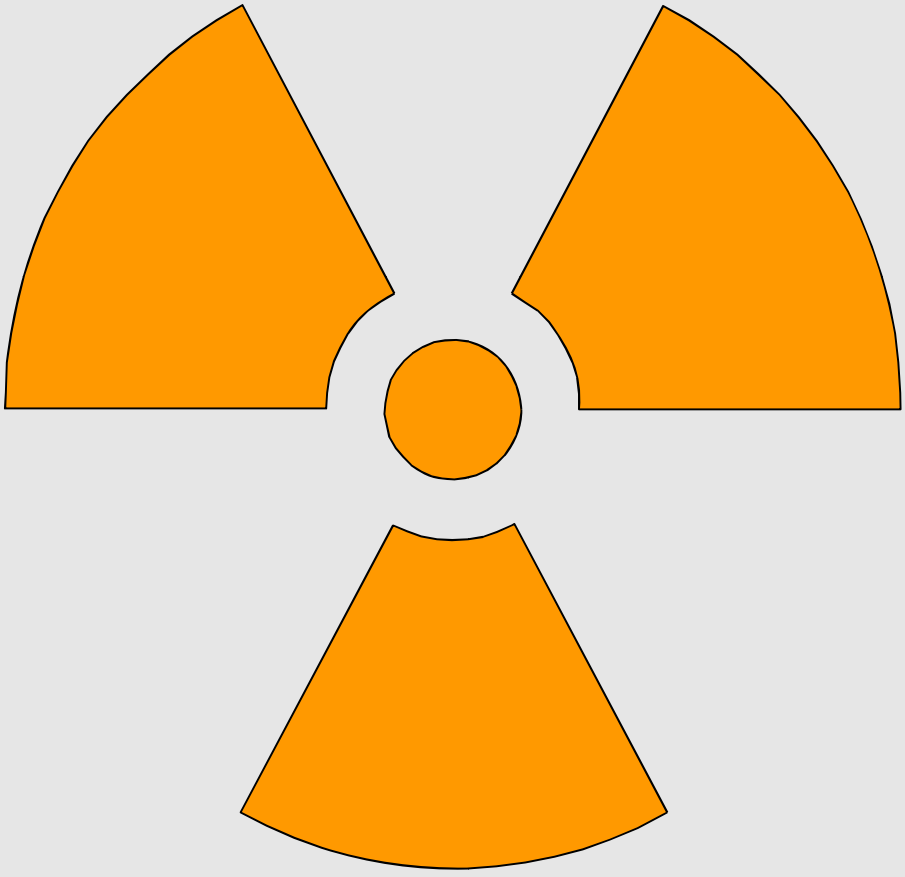
Irradiator Technology
H-315 Session 5

Cobalt 60



Loading

Cobalt Loading

- Order Cobalt
- Confirm delivery date
- Call USNRC (authorities) (Post 911)
- Schedule crane
  - Describe the job (show it)
  - Container weight 12,000 lbs
  - Building height
  - Location of roof plug
- 40-60 ton hydraulic crane
- Wired intercom or good wireless
- 2 slings x 25 ft for container
- 1 sling x 27 ft for container plug
- Vacuum pool 1 week before

Cobalt Loading

- Truck with open top
- Schedule :
  - Truck
  - Crane
  - Nordion , all at same time
- All source handling tools + table ready
  - Clean + lubricate all poles
  - Clean + check work table
  - Check ropes (4)
  - Check all source handling tools:
    - Module tool
    - Hook
    - Wipe holder
    - Horizontal tool
    - Vertical tool
    - Latch opener
    - Socket
    - Magnifier glass (clear ?)
    - Pool lights (spare bulbs)
    - Water bottle, hoses

Cobalt Loading

- Move carriers , clear access
- Check filter for contamination
- Bring into irradiator:
  - Work table
  - Tools
  - Lights
  - Ropes
- Fill water jug with deionized water
- Give TLD's to crane + all operators
- Lower pool water level by 10"-12“
- Nordion must supervise:
  - Crane in position
  - Truck in position
  - Explain job to crane operator
  - Nordion's personnel check container(s)
  - Crane removes 3 roof plugs

SOURCE DOWN !!!

Cobalt Loading

- Nordion must supervise:
  - Container surveyed + cleared
  - Remove base bolts + fire shield
  - Remove truck top cover if any
  - Tools needed:
    - Fire shield 2 x 9/16"
    - Top air vent 11/16"
    - Container plug main bolts 1-5/16"
    - Bottom drain 1-1/8"
    - Base bolts 2 x 1-1/8"
- Nordion personnel:
  - Remove fire shield with helper
  - Contamination tests
  - Main plug bolts finger tight
  - Hook container to crane (3 slings)
- Operator + crane helper on roof
- Nordion personnel empties container
- Put back base bolts, fire shield
- Assist preparing empty container

Cobalt Loading

- Underwater unload of shipping container
  - Container survey, surface + T.I.
  - Surface contamination test
  - Remove fire shield + base bolts
  - Source in container contamination test
  - Roof plug removal - Irradiator shut down!!
  - Container hook up
  - Bolts finger tight
  - Container at water level, remove but 2 bolts
  - Container to bottom of pool
  - Remove last 2 bolts
  - Lift shield plug
  - Lift source container
  - Put back shield plug
  - Lift back in truck
  - Drain
  - Secure, put back fire shield
  - Labels, documents, records

Cobalt Loading

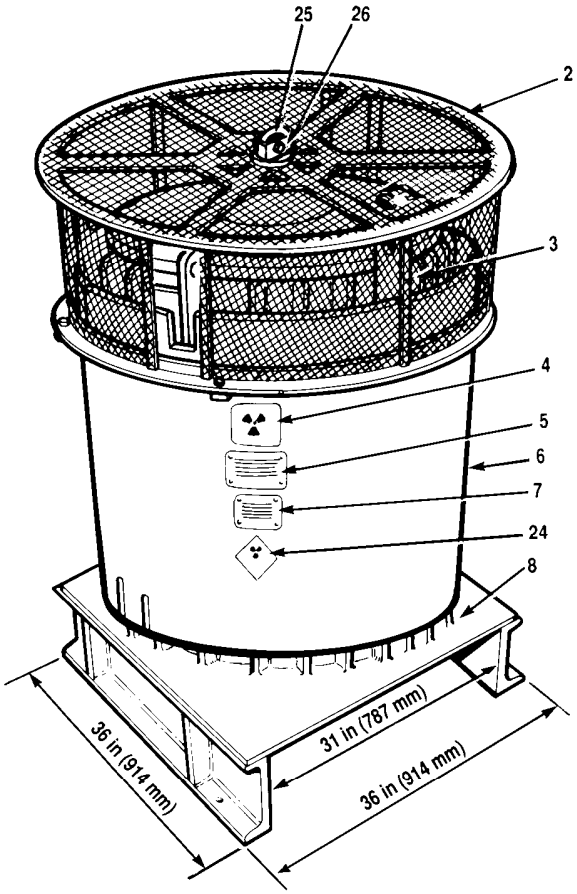
- Highlights of underwater source loading
  - Lower table
  - Place source cage(s) on table
  - Move module to table
  - Open module latch
  - Remove, add, reposition or temporarily store pencils
  - Identify each new pencil serial number
  - Close source module latch
  - Store temporarily or reposition source module
  - Repeat for all modules
  - Remove work table
  - Wipe source in rack
  - Wipe all source handling tools
  - Wipe work table
  - Documents/records as you go

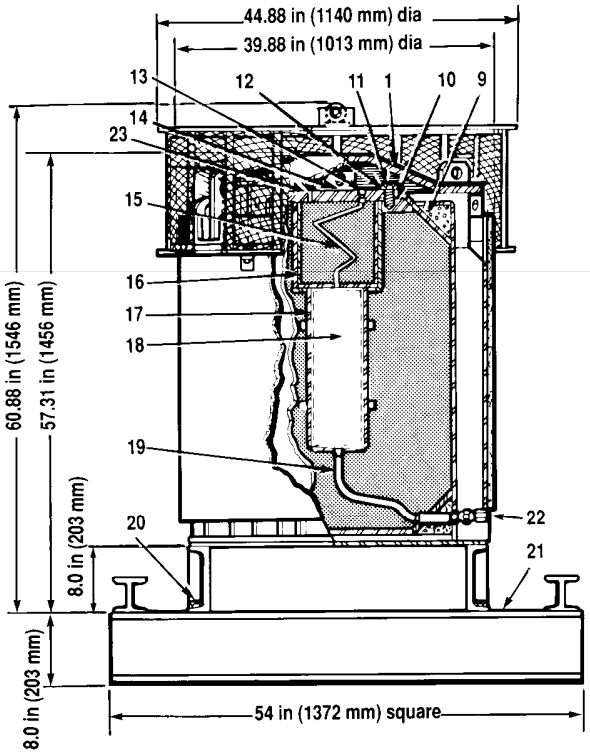
Source Loading Video

F-168 Type B(U) Transport Package

Parts List

1. Upper Fireshield
2. Heat Screen
3. Retaining Brackets (4) for Upper Fireshield
4. Radiation Caution Plate (2)
5. Nordion Identification Plate (2)
6. Fireshield (Removable) Laminated Construction:
   2 x 0.25 in (6.3 mm) Steel + 1 in (25.4 mm) Kaowool. O.D. 39.88 in (1013 mm)
7. Warning Plate "CAUTION - HEAT EMITTER - DO NOT STORE IN INSULATED OR REFRIGERATION CONTAINER OR INSULATED SPACE" (2)
8. Transite - Steel Encased
9. Vermiculite Packing
10. Gasket (Neoprene)
11. 7/8—9 × 2 in long Hex Bolt (8)
12. Wire Seal
13. 3/8 in NPT Pipe Plug (2)
14. Plug Lift Lug
15. Vent Tube
16. Plug
17. Cavity: 18.87 in × 6.37 in Dia. (479 mm × 162 mm Dia.)
18. Radioactive Contents and Carrier
19. Drain Tube
20. 3/4—10 × 2 in Hex Bolt for Skid (4)
21. Removable Shipping Skid, 54 in (1372 mm) square
22. Nipple and Drainline Cap
23. Shield Plate with 3/8—16 Bolts (3)
24. Category Label (2)
25. Eye Bolt
26. Eye Bolt Cover

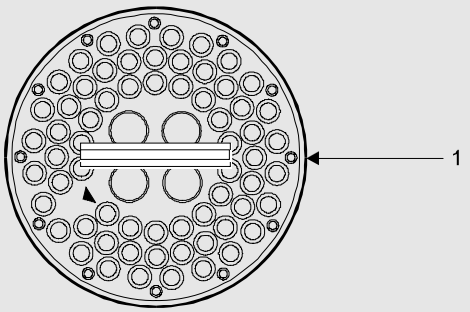


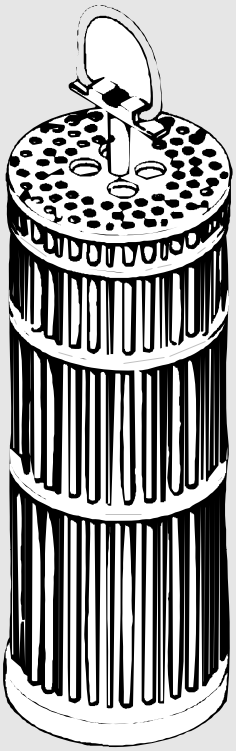


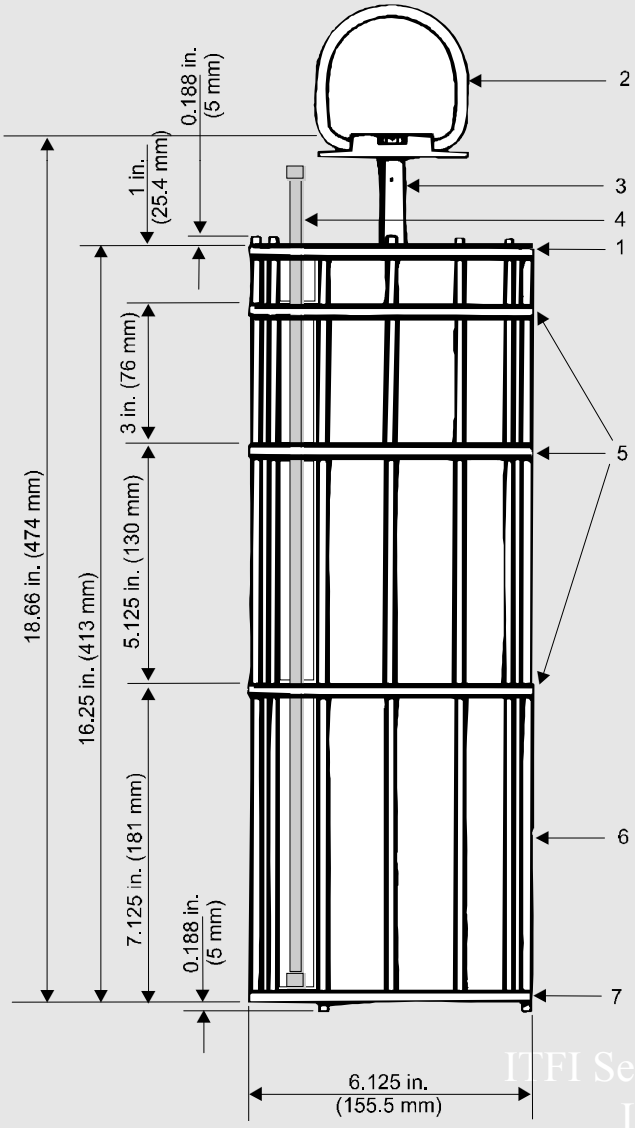
Notes

1. AECB Certificate CDN/2012/B(U)
2. Meets IAEA Type B(U) Requirements
3. Steel encased lead shielding: 10.5 in (266 mm)
4. Gross Weight: 12,000 lb (5445 kg)
5. Plug Weight: 390 lb (177 kg)
6. Projected Floor Loading: 593 lb/ft^2 (2900 kg/m^2)
7. Radionuclides carried:
   1. Cobalt-60
   2. Antimony-124
   3. Cesium-137
8. Labels may be positioned as illustrated, or 45° to that shown
9. Heat screen used only for air and non-exclusive use shipments

F234 Source Capsule Carrier







Notes:

1. Material stainless steel 316
2. Welded construction
3. Carrying capacity 64 C-188
4. Used in the F-168 transport packaging
5. Total weight: 9 lbs (4.1 Kg)

Parts List:

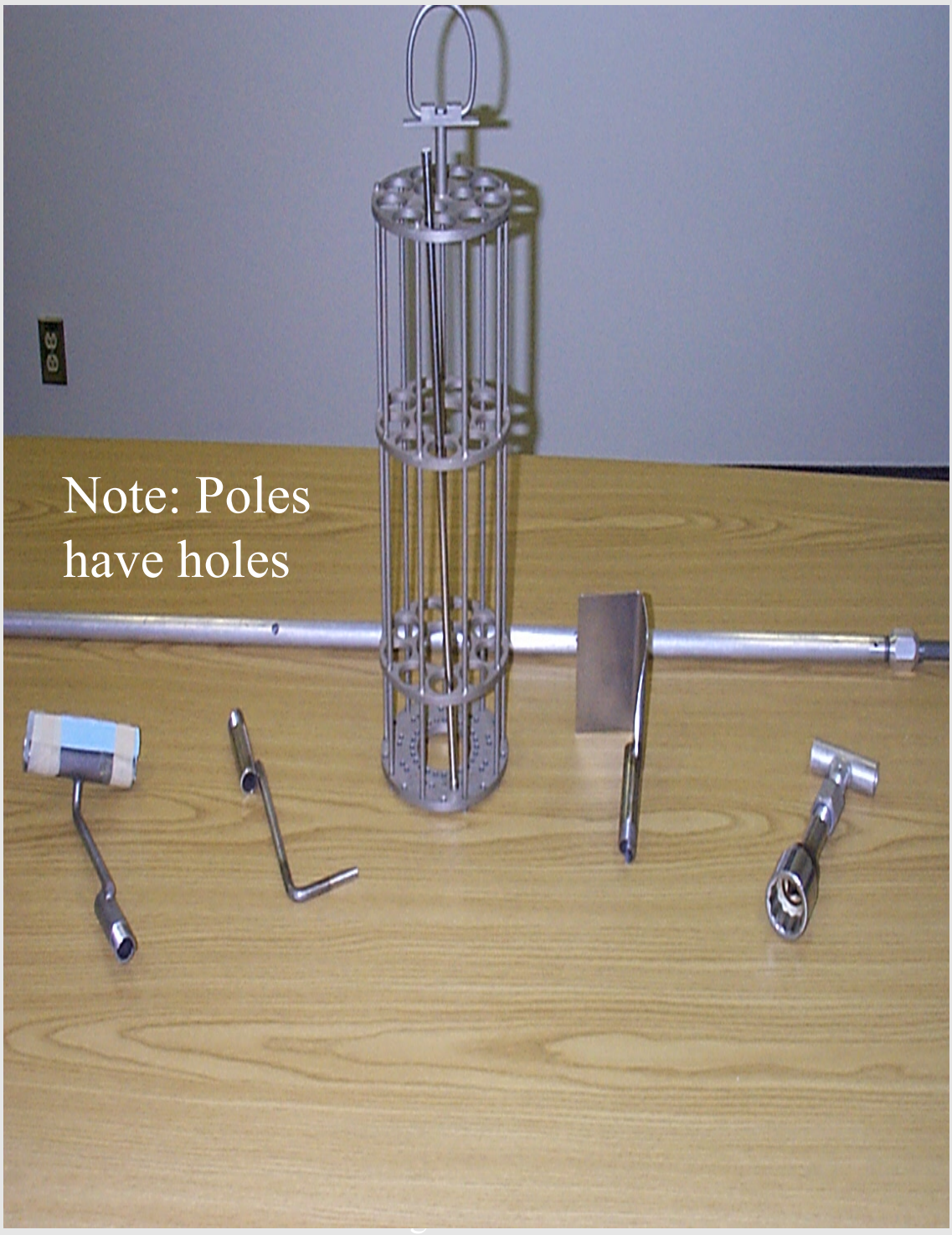
1. Top plate 0.25 in. thick (6 mm)
   1st row = 24 holes
   2nd row = 23 holes
   3rd row = 17 holes
   All holes 0.47 in. dia. (12 mm)
2. Swivel type lifting handle 0.25 in diameter (6 mm)
3. Centre post: Above top plate 0.5 in. dia. (13 mm)
   Below top plate 0.25 in. dia. (6 mm)
4. C-188 capsule assembly, ref. drawing A05244
   17.77 in. long (451 mm)
5. Spacer plates: 0.25 in. thick (6 mm)
6. Support rods: 0.25 in. thick (6 mm) [12]
7. Base plate 0.25 in. thick (6 mm)
   1st row = 24 holes 0.256 in. dia. (7 mm)
   2nd, 3rd rows = 24 holes 0.25 in. dia. (6 mm)
   4th row = 18 holes 0.25 in. dia. (6 mm)

ITFI Session 5 Cobalt
Loading

Source Handling Tools

Loading

Source Handling Tools



Source Handling Tools

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