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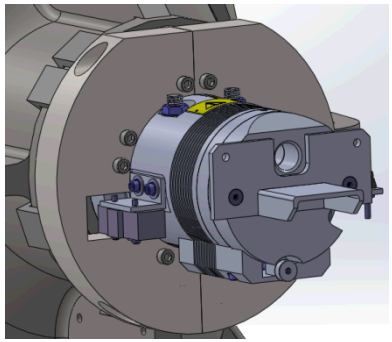

Hardening the Teletherapy Irradiator

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U.S. DEPARTMENT OF ENERGY | NNSA

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Outline

- Teletherapy Irradiators
- Need for Hardening Irradiator
- In-Device Delay Kit
- Roles
  - National Nuclear Security Agency
  - Sandia National Laboratories
  - Best Theratonics
  - Agents
- Process and Key Dates

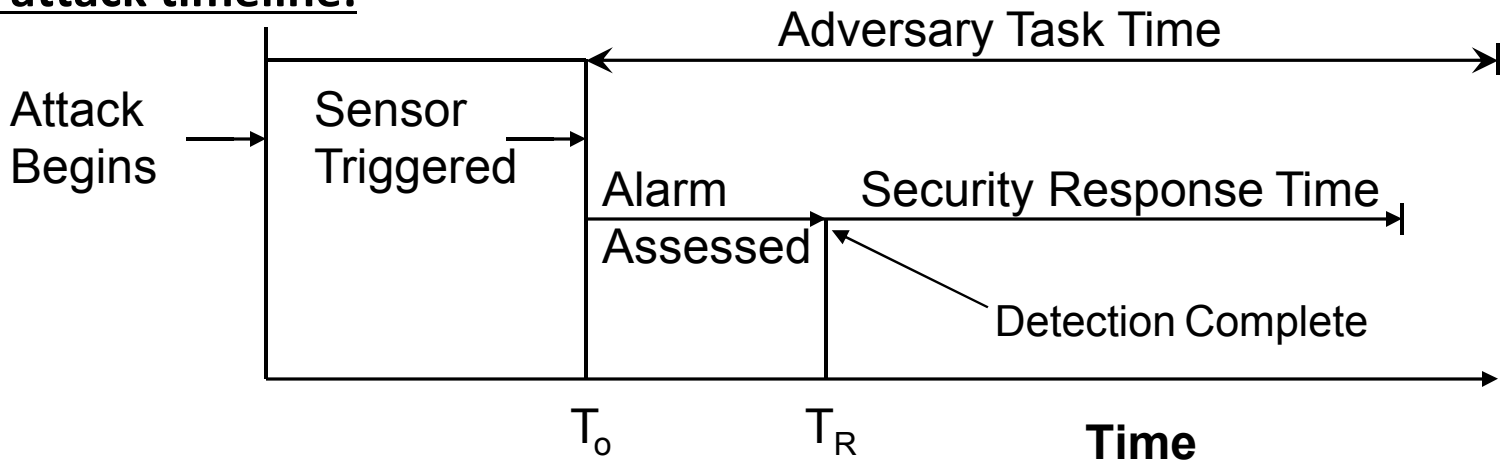
Physical Protection System Elements

Three key elements:

1. Intrusion Detection and Assessment
2. Access Delay
3. Security Force Response

Radiation safety measures rarely provide delay!

Basic attack timeline:

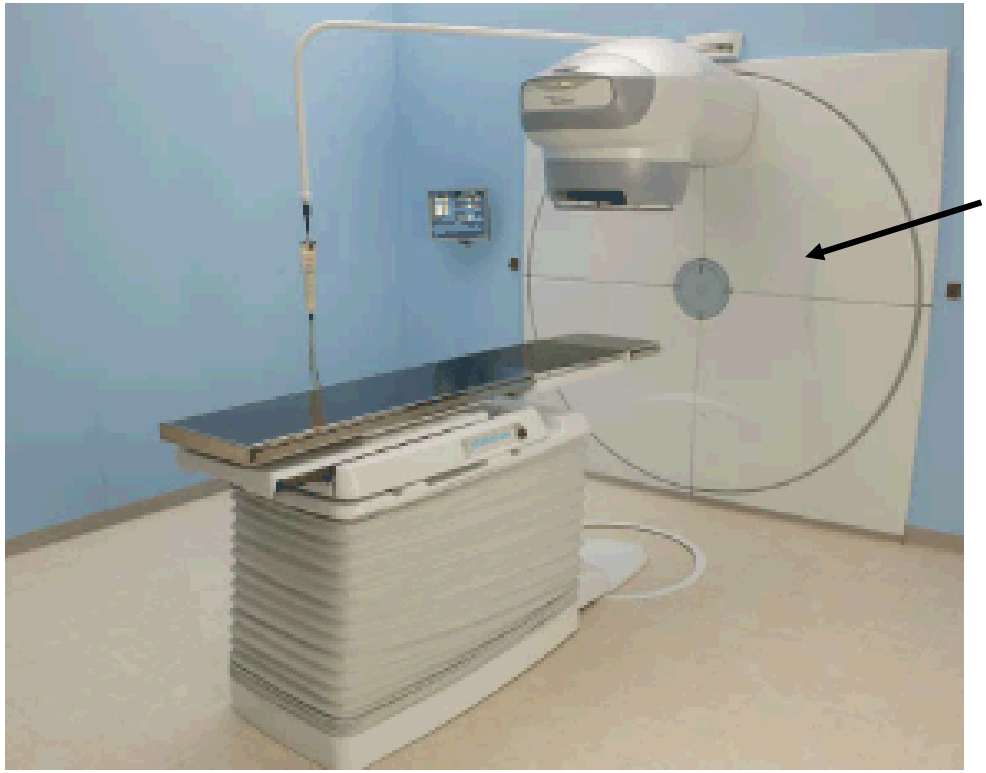


Ways to ensure total *Response Time* < *Adversary Task Time*:

- Sense Attack Earlier
- Reduce Detection/Assessment Times
- Reduce Security Force Response Time
- Increase Adversary Task Time (**delay adversary**)

Teletherapy Design Overview (non-Equinox)

Equinox Model



Need for Hardening Irradiators

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- Irradiators contain radiological materials, such as Co-60, or Cs-137.
- The security of irradiators needs to be improved to protect the source material from those who may want to do harm.
- National Nuclear Security Administration's (NNSA), Global Threat Reduction Initiative (GTRI) is focused on enhancing security of nuclear and radiological materials in the United States and abroad.
- There are hundreds of Teletherapy machines in the world.

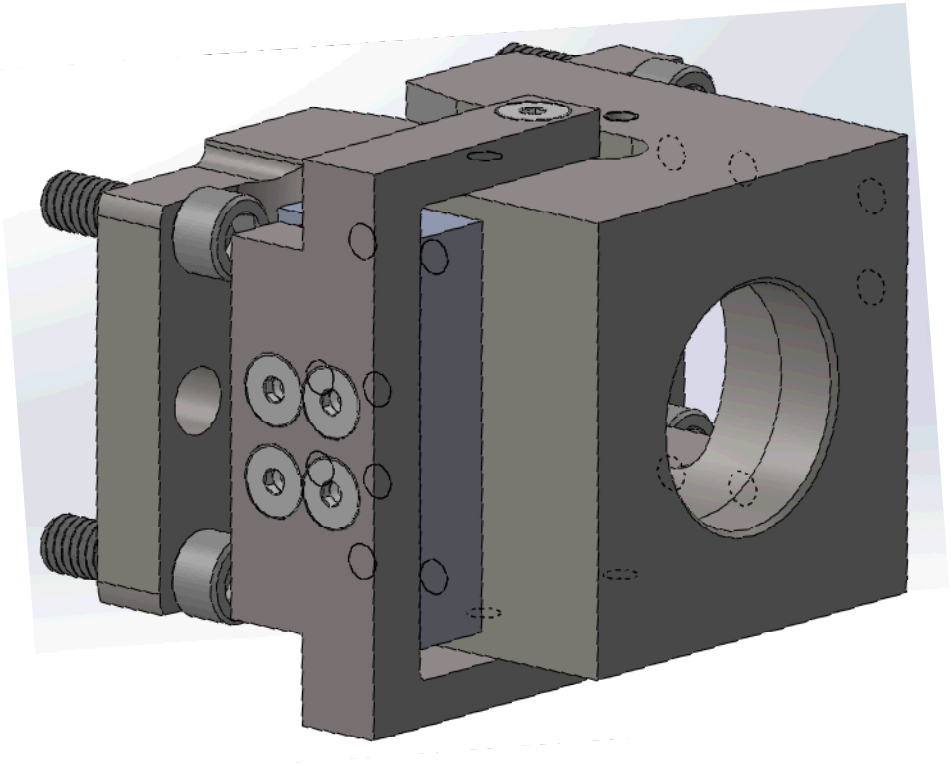
In-Device Delay Kit Overview

Sandia National Laboratories

- Sandia National Laboratories, in support of NNSA's Global Threat Reduction Initiative, has designed In-Device Delay kits to improve the security of irradiators
- These kit attach to the irradiator to delay access to the source material. They essentially require more time to remove hardware to get to the radiological material.
- Protect three areas: Neck, Arm, and Head of irradiator

Neck Hardware

- Bolts on to existing air cylinder bracket

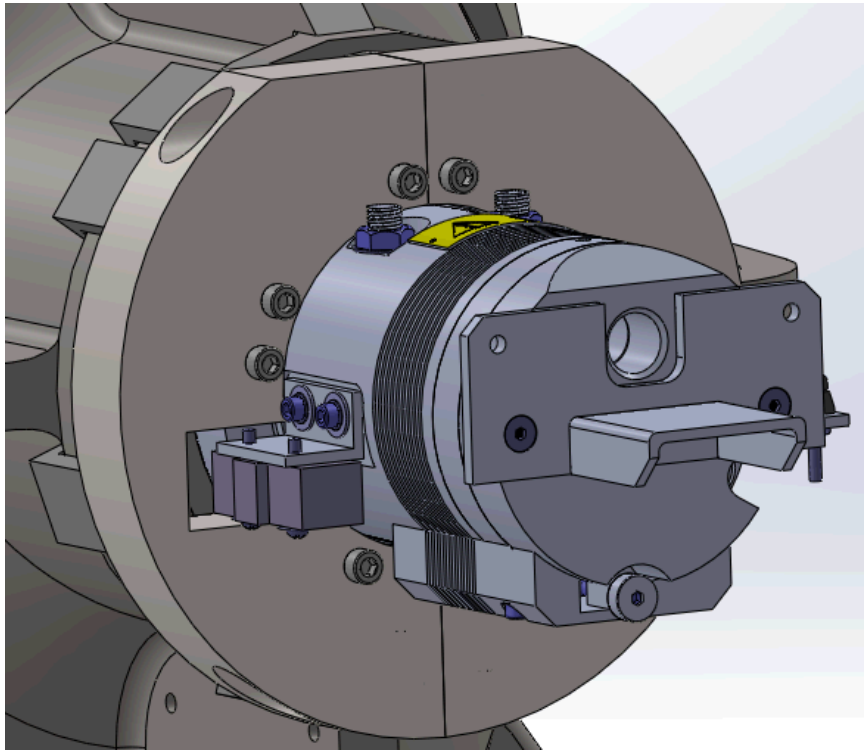


Arm Hardware

- Attaches to arm to cover access hole

Head Hardware

- Attaches to Field Light Assembly



Roles

- National Nuclear Security Agency, Global Threat Reduction Initiative, Washington, DC, USA.
  - U.S. Federal Agency responsible for implementing program to reduce threats from radiological sources
- Sandia National Laboratories, Albuquerque, NM, USA
  - National laboratory responsible for research, development and design of security systems to meet NNSA's mission. Developed and designed IDD kit for teletherapy units.
- Best Theratronics, Ontario, Canada
  - Commercial entity who design and manufactures teletherapy irradiators around the world. Responsible for validating the integration if IDD kits into teletherapy machines. Interfaces with international agents.
- Agents (international, e.g. Peru)
  - Responsible for maintenance and reloading of irradiators. Certified to handle radiological materials.

Process to Field IDD Kits

Sandia National Laboratories

- Conceptual IDD Kit Design Complete (March 2013)
- Attack Tested to Validate Design (August 2013)
- Design Modified to Account for Lessons Learned (Sept 2013)
- Design Under Review and Integration by Best (May - Sept 2013)
- Pilot Installation in Texas (est Nov 2013)
- Regulatory Approval by NRC (est January 2014)
- Agents Conducts Site Survey of Teletherapy Units (est Nov 2013)
- Procure IDD Kits for Peru (Nov 2013)
- Field Install IDD Kits in Peru (Feb 2014)