



# Homeland Security

## **Radiation Safety for Customs & Border Protection Officers and Ports**

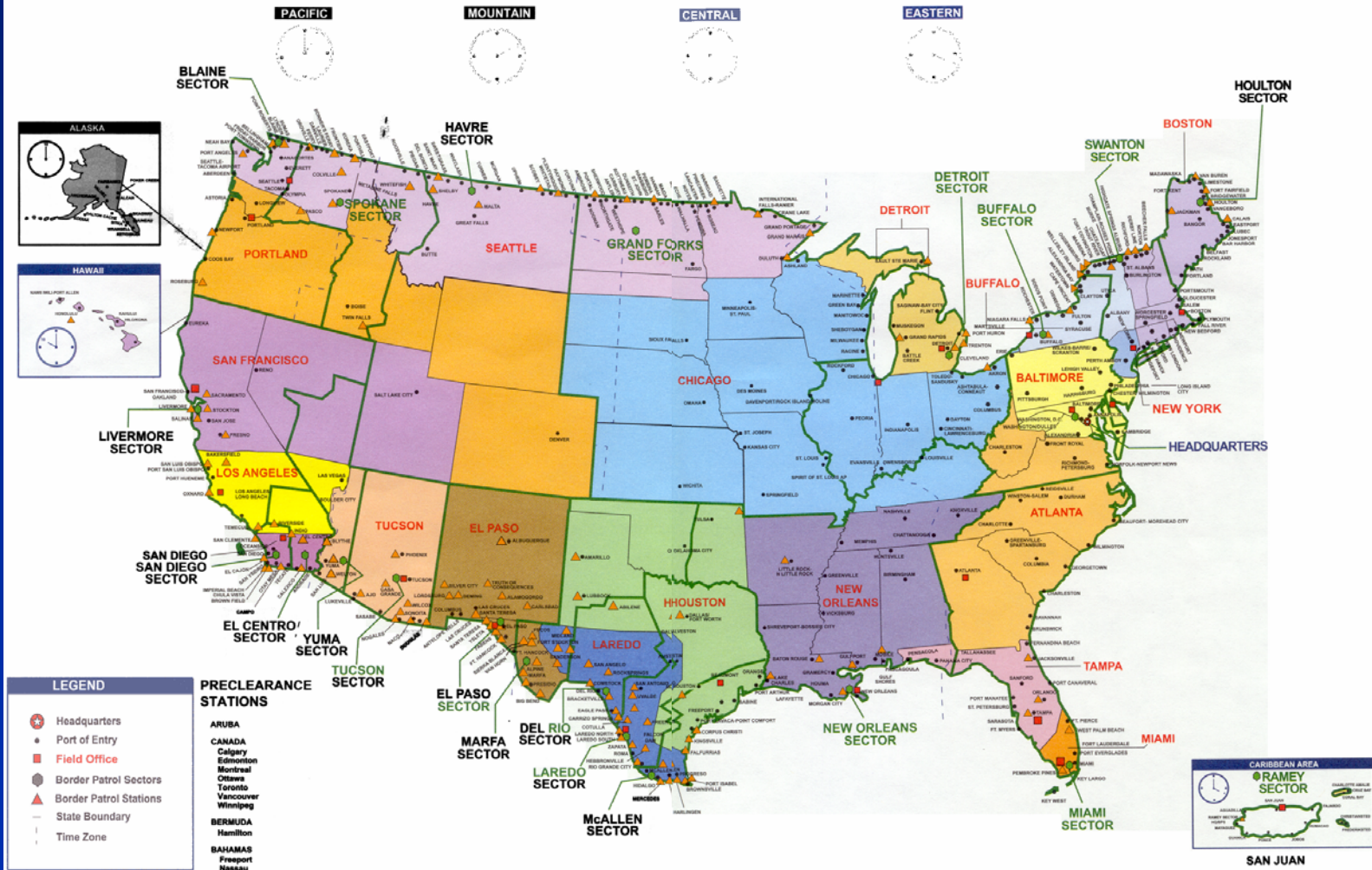
Luke McCormick

Department of Homeland Security

US Customs & Border Protection

# The Mission

## U.S. Customs and Border Protection



# The Daily Challenges

- 7500 miles of Land Borders,
- 89,000 miles of Tidal Shoreline,
- 1.1 million people including 724,192 aliens enter,
- 359,129 vehicles
- 62,026 trucks and containers,
- 2,526 aircraft,
- 27 million packages/bags per day,
- 56,363 merchandise entries, and
- collected \$68 million in revenue.

# **CBP Sites Worldwide**

**Canada (3), Netherlands, Germany (2)**

**Belgium, France, Sweden, Italy (3),**

**United Kingdom, Greece, Spain,**

**Singapore, Japan (4), Hong Kong,**

**South Korea, Malaysia, Thailand,**

**South Africa, Malta, Bermuda, Bahamas**

# The Resources



57 Different types of Radiation Equipment

# Our Most Valuable Resource



**17,000 highly trained Officers**

# The Core of the CBP Program

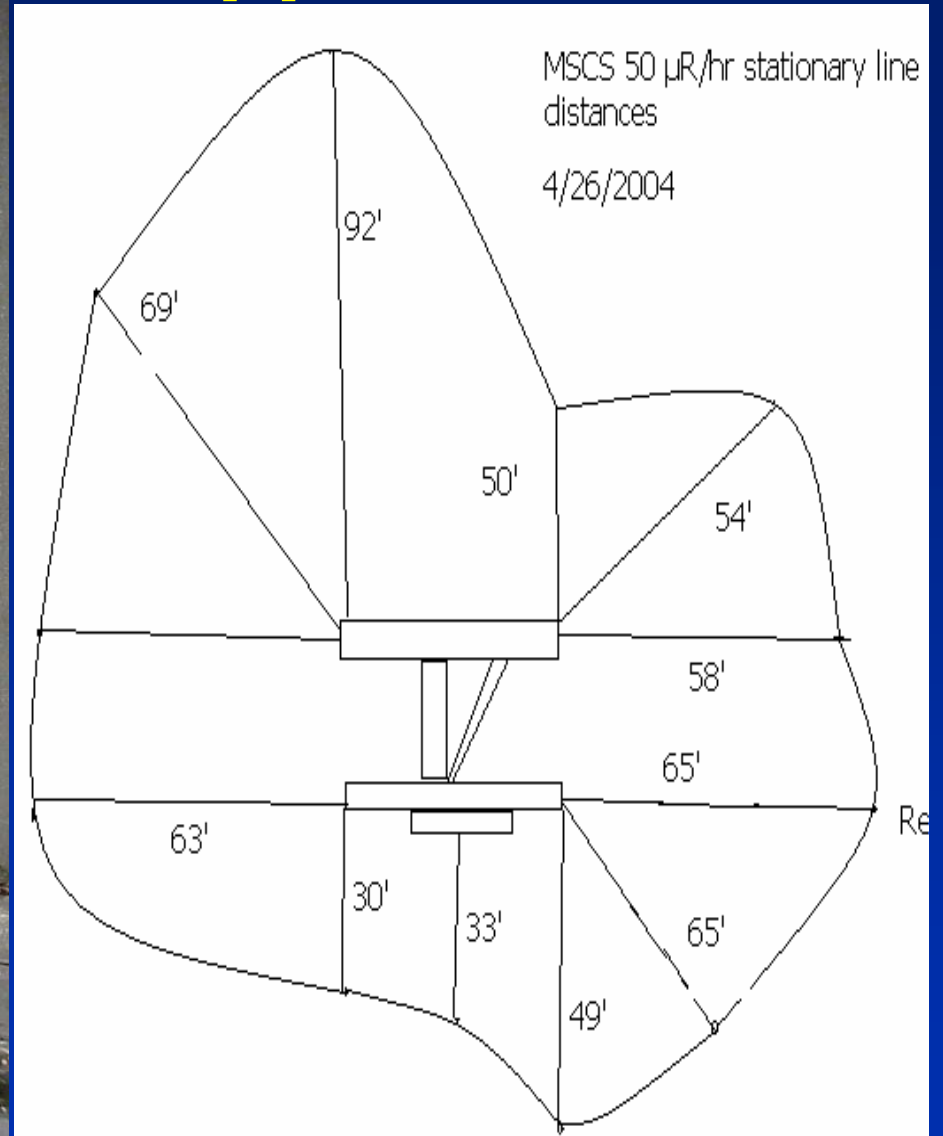
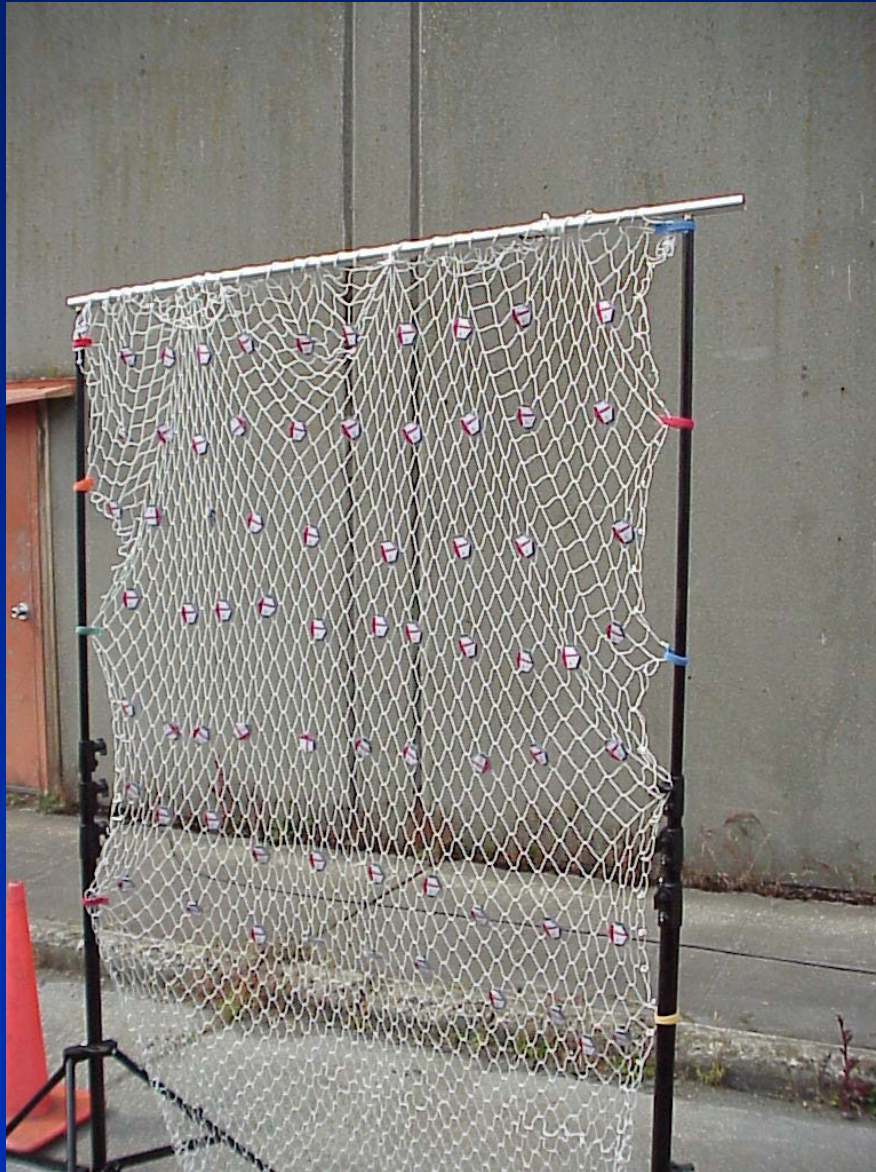
- Keep Officers dose < 100 mR/yr
- Survey Each Type of Equipment
- Work with Manufacturers and Regulators
- Keep Port Workers Out of Exclusion Zones
- Limit Workers in Controlled Areas
- Train Officers
- Audit Port Programs

# NII Equipment is thoroughly surveyed

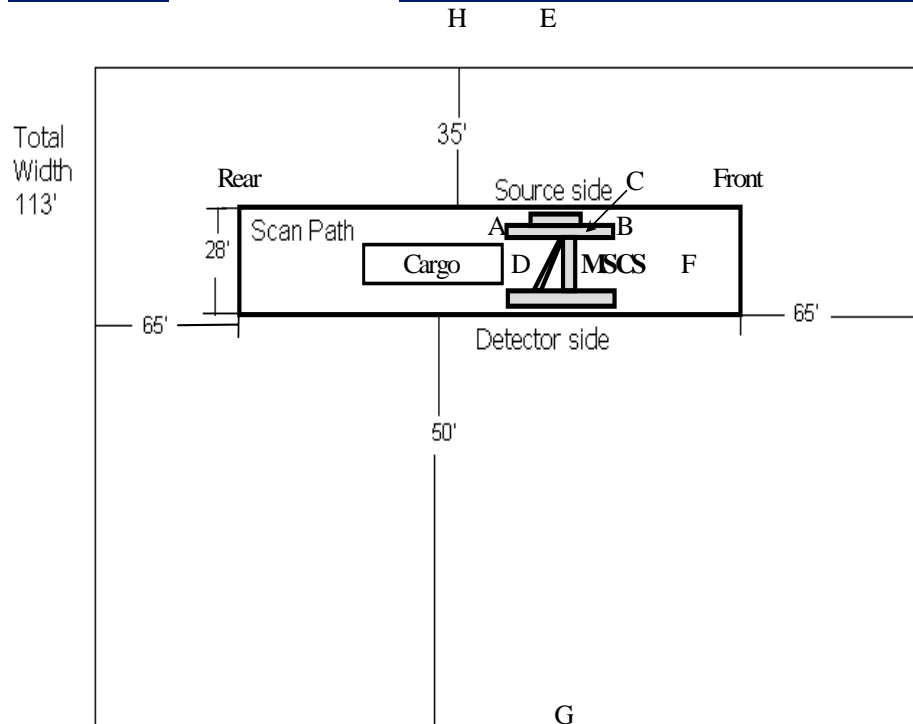




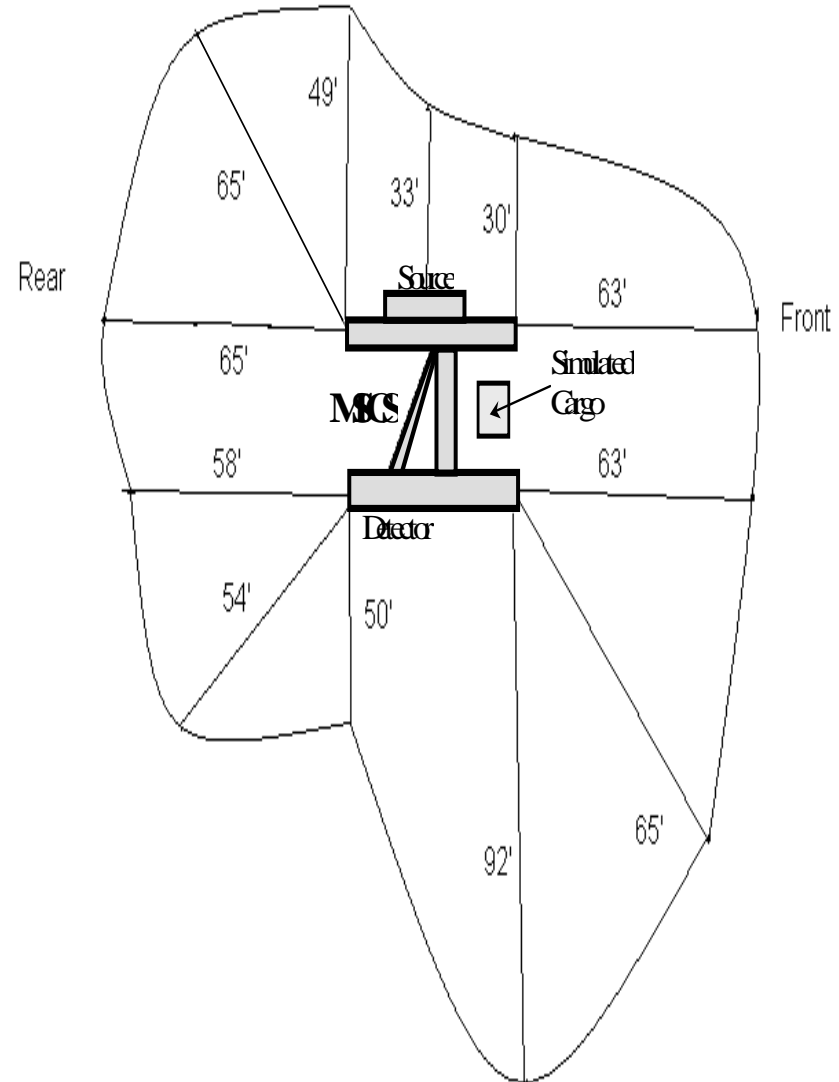
# Doses are mapped



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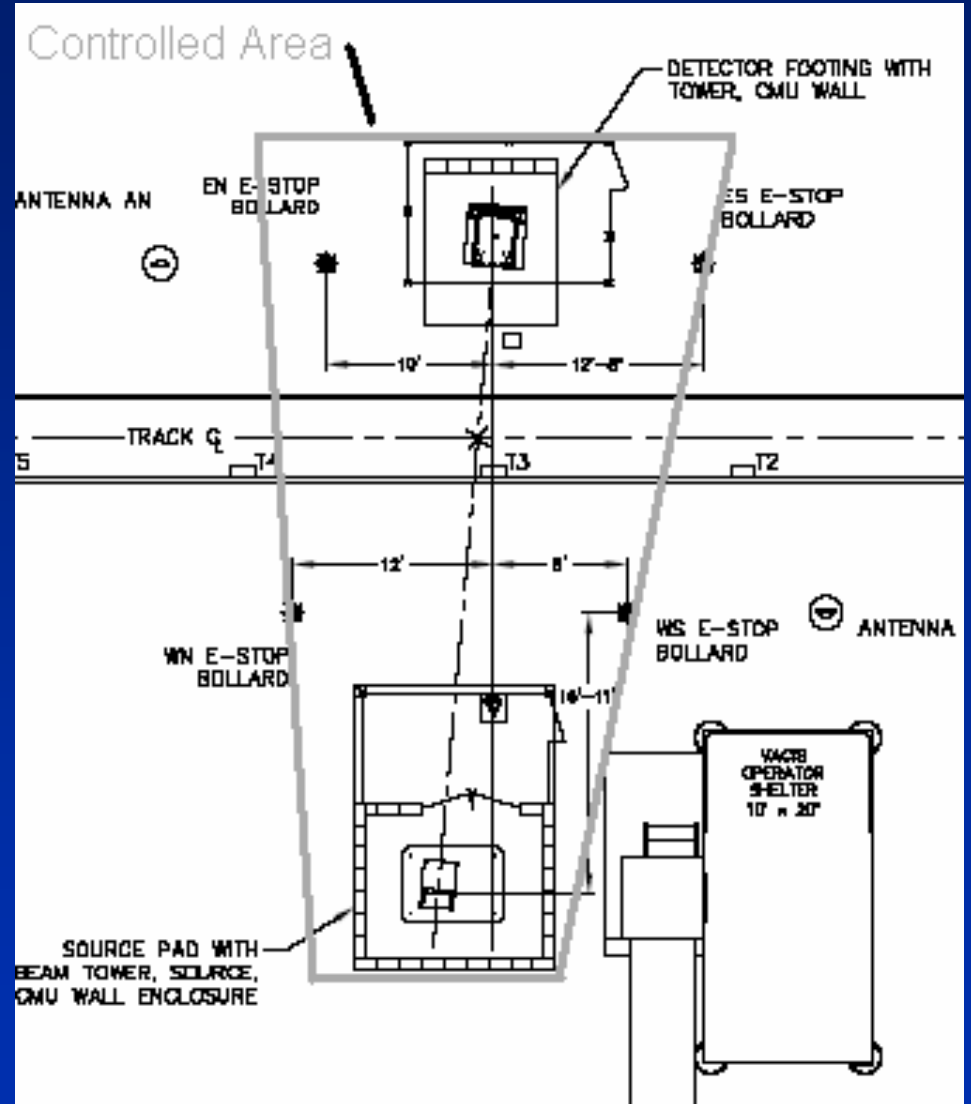
For two 40' cargo containers with 10' between them and 65' on each side, the total length is 220'.



# Exclusion area and Controlled area



# Rail VACIS



# Mobile VACIS



# Two Types of Scans Stationary & Rolling

- **Stationary requires 2 Operators**
- **Rolling requires 3 Operators**
- **Rolling scan removes driver from truck allowing scan of drivers compartment**
- **Stationary scan driver pulls up so beam is behind the cab, on signal drives trailer through beam.**

# Stationary Scan

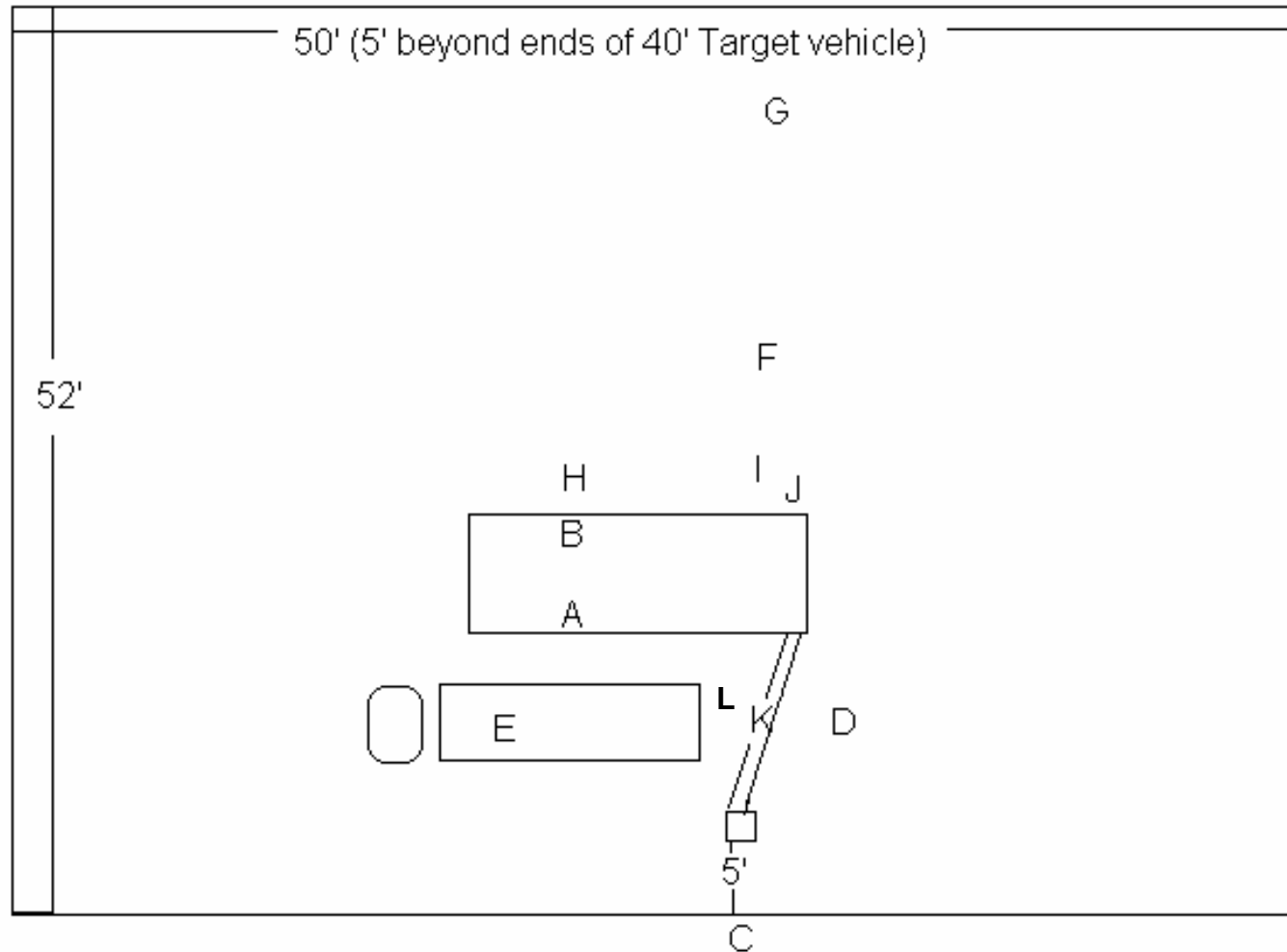


# Rolling Scan



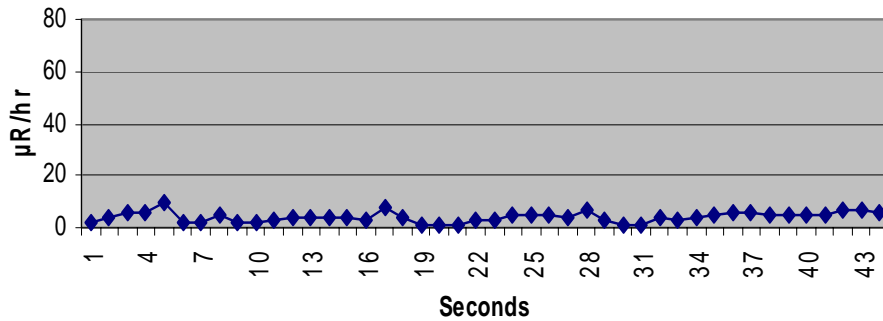


# Survey Points.

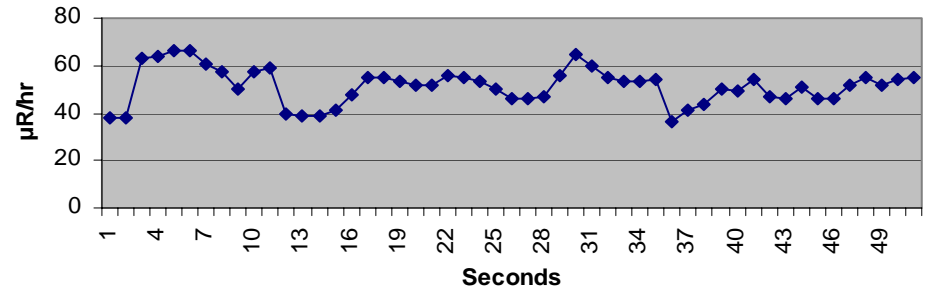


# Typical Survey Results

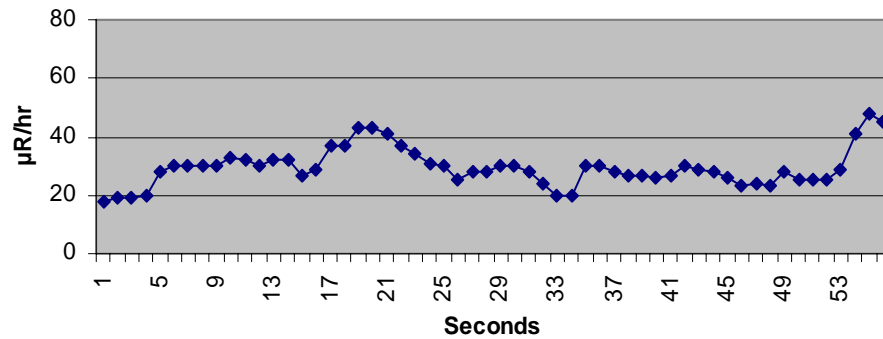
Background



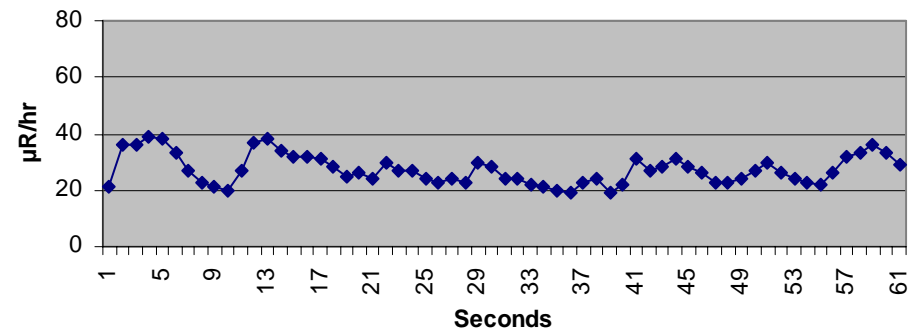
Rear Bench Sear Far Left



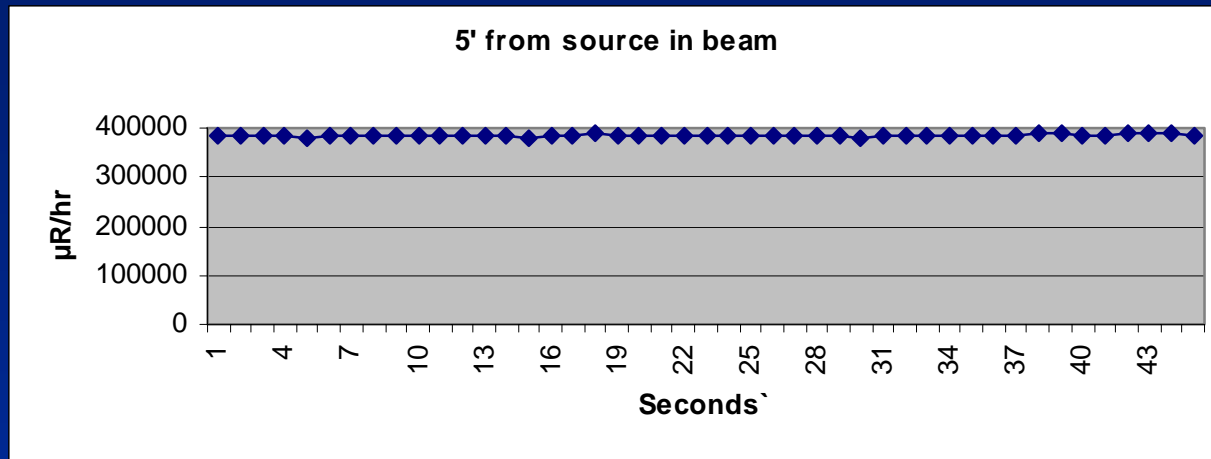
5' behind source in line



25' behind detector tower in beam



# Dose in Beam



# Dose to a Stowaway

- Background dose, 1 year – 360,000 microrem
- Rail VACIS ----- 2.5 microrem
- Mobile Truck Gamma ----- 4 microrem
- VACIS-II ----- 5 microrem
- Truck X-ray - -----40 microrem

# Radiation Detection Equipment



# Radiation Detection Directive

- If radiation is detected, it must be resolved.
- If a pager reads 9, back off until it reads 8.
- If back-off distance is less than 10' a 3 minute inspection is allowed.
- If back-off distance is greater than 10' isolate the shipment, call LSS experts.
- If neutrons are detected, isolate the shipment, call LSS experts.

# Common Radioactive Shipments

- Medical Isotopes and persons receiving them.
- Agricultural products, fruits & leafy vegetables, tobacco,
- Bananas (large quantities)
- Antique items, Ceramic-glazed products “Vaseline” glass.
- Camera lenses and any high-quality optical lens system
- Radio-luminescent products (radium paint, Tritium)
- Dental ceramics
- Irradiated gemstones
- Lantern mantels (natural Thorium)

# Common Radioactive Shipments

- Polishing powders
- Propane tanker trucks
- Smoke detectors (Am-241)
- Televisions sets
- Thoriated aluminum (an alloy containing Th-232)
- Thoriated tungsten arc-welding rods
- Uranium ore samples
- Naturally occurring radioactive material stone, slate and concrete, feldspar, fertilizers, and granite.



# In Summary

- CBP Workers are only allowed the same dose as members of the public.
- This dose is less than 1/3 of background
- Port workers and the Public are kept clear of operating equipment so receive less dose.