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Activities and Issues in Monitoring Scrap Metal against Radioactive Sources

Presented at

***International Conference on Control and
Management of Occasional Radioactive Materials
in Scrap Metal***

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Scrap Metal Is An Important Internationally Traded Commodity

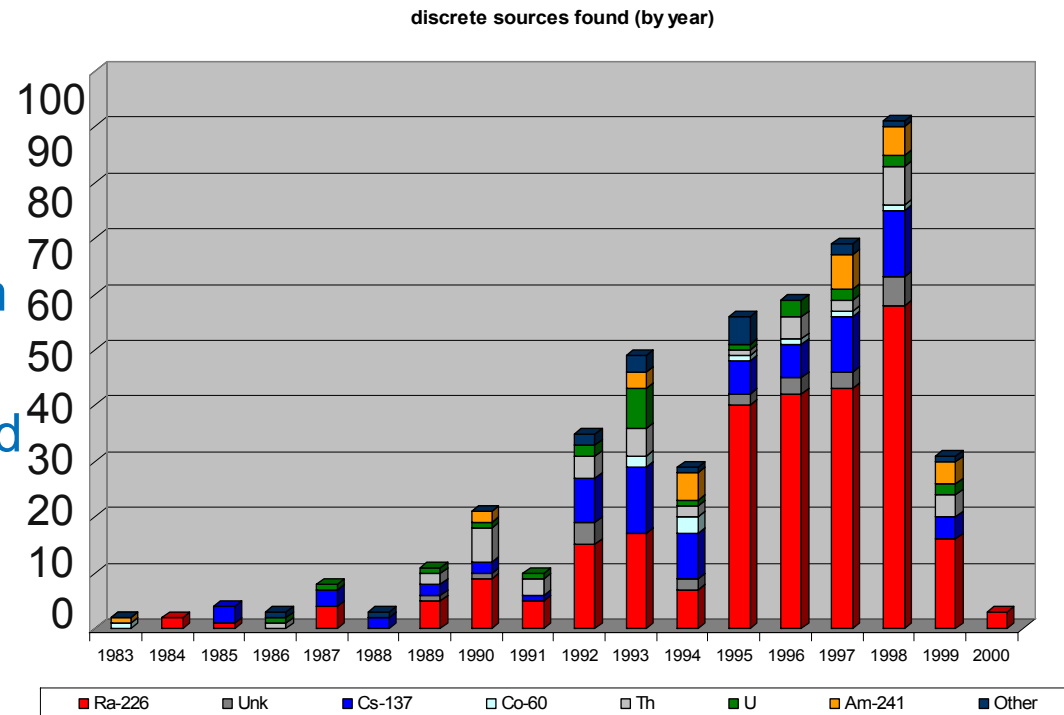
- ❑ Scrap Metal Industry
 - ❑ First link of the manufacturing supply chain
 - ❑ A capital-intensive industry

- ❑ In the U.S. (ISRI, 2006)
 - ❑ 17 million tons exported
 - ❑ 90 million tons recycled
 - ❑ 2 out of 3 tons of steel made used ferrous scrap
 - ❑ Conserves resources and provides energy savings



Orphan Sources Have Caused Concerns for the Metal Recycling Industry

- ❑ More than 200 reported loss of sources annually in U.S.
- ❑ Accident melts of sources can cost mills million of dollars
- ❑ Better detection has decreased the number of event
- ❑ More need to be done



(Yusko 2002)

Industry Has Responded with Sensitive Detection Systems

Expensive (over \$100K U.S.) detection systems have been deployed at the steel mills...



Truck passing through monitors



Portal radiation monitors



...Is it effective?
(Source: NCRP 2002)

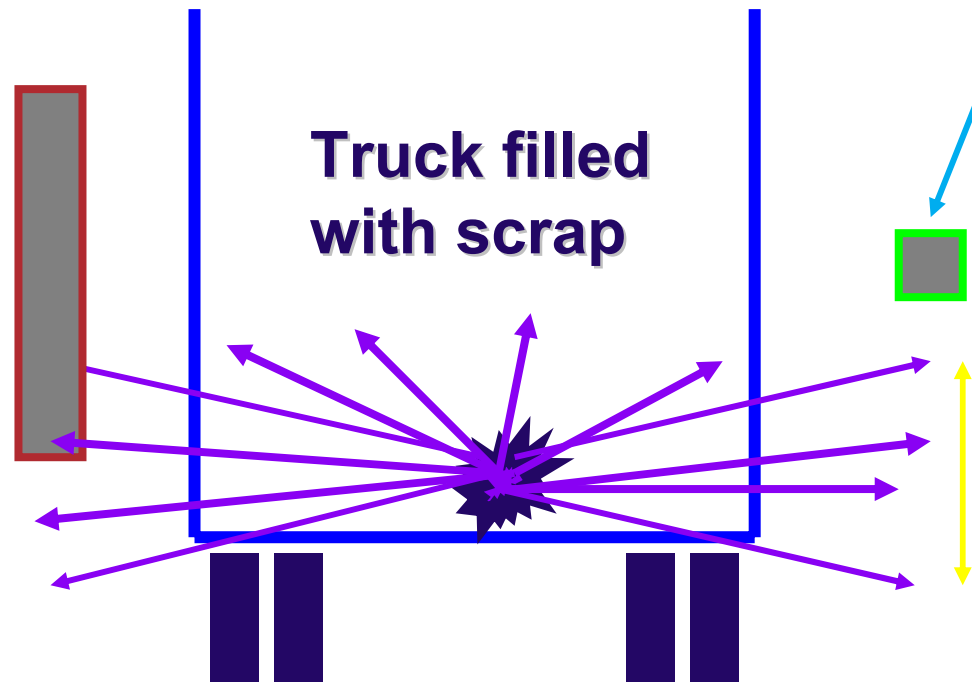
Radiation Detection Has Its Limitations

Large area detector picks up radiation

Small Area Detector misses radiation

Limitations

- Detector size
- Source location
- Scrap thickness
- False alarms (e.g., NORM)



Typically have 18" to 24" spread

Lamastra, A. 2003

EPA's Orphan Source Initiative Was Aimed to Reduce the Radioactive Source Contamination

- ❑ US EPA/US Customs Scrap Monitoring Pilot Program (Using Detector-Mounted Grapples) at Ports of Entry
- ❑ Source Tracking Using Radiofrequency Identification (RFID)
- ❑ Alternatives to Radiation Sources in Gauges and Devices
- ❑ Collection and Exchange of Sources
- ❑ Training on Building Demolition





EPA initiated a Pilot Project in 2001 for scrap metals at ports of entry

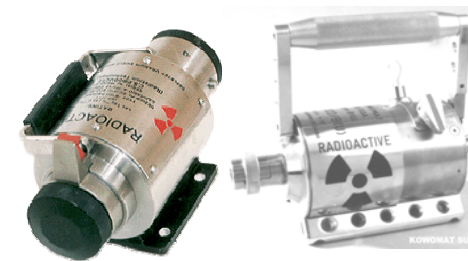
- ❑ Use grapple mounted with detector
- ❑ Remote system for data recording
- ❑ Protocol for handling and reporting of radioactive materials
- ❑ Pilot study for two ports
- ❑ Total of 70 million tons processes

Efforts By Other Government Agencies Are Also Made to Control Propagation of Radioactive Sources

- ❑ DOE's Offsite Source Recovery Project has been a great success
 - ❑ **Recover over 18,000 sources from 700 sites**
- ❑ NRC's source tracking rule helps secure the licensed sources



- ❑ **National Source Tracking System (Category 1 & 2 Sources)**
- ❑ DHS's Border Protection Initiatives helps secure ports of entry
 - ❑ **Better intelligence and more sophisticated detection technologies**
- ❑ Individual states provide added measures on source controls



UNECE Coordinated Meetings for Group of Experts on Monitoring Radioactive Scrap Metal

- ❑ 2002 – Coordinated with IAEA and EC on radiation aspects
- ❑ 2004, 2006 – Group of Experts Meetings to develop:
 - ❑ International “Protocol”
 - ❑ Internet-based information exchange system
 - ❑ Training program

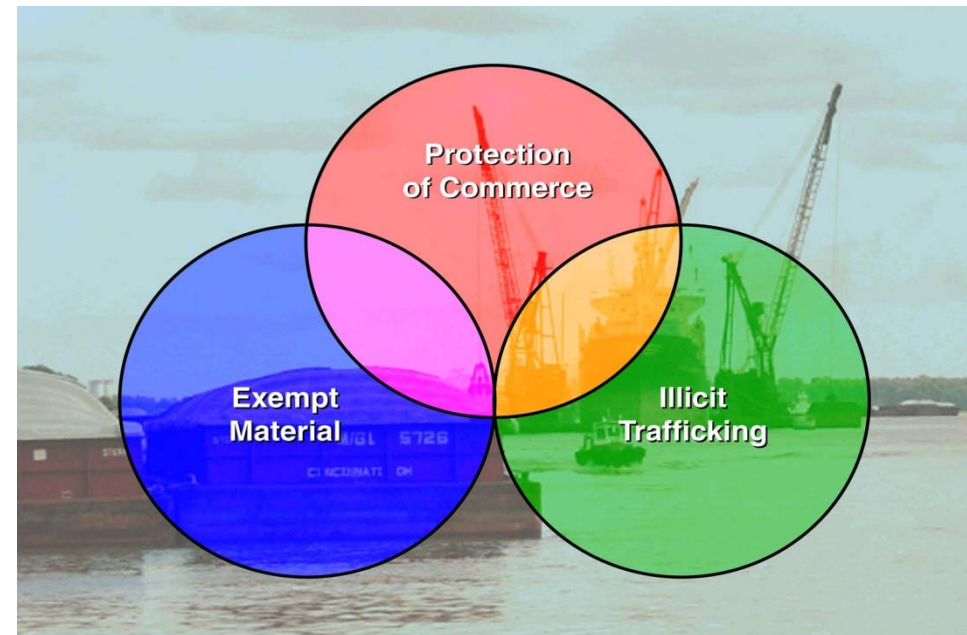


(UNECE, Geneva, 2006)

Various Intersecting Interests and Jurisdictions Warrant a Coordinated Effort to Address the Scrap Metal Contamination Issues

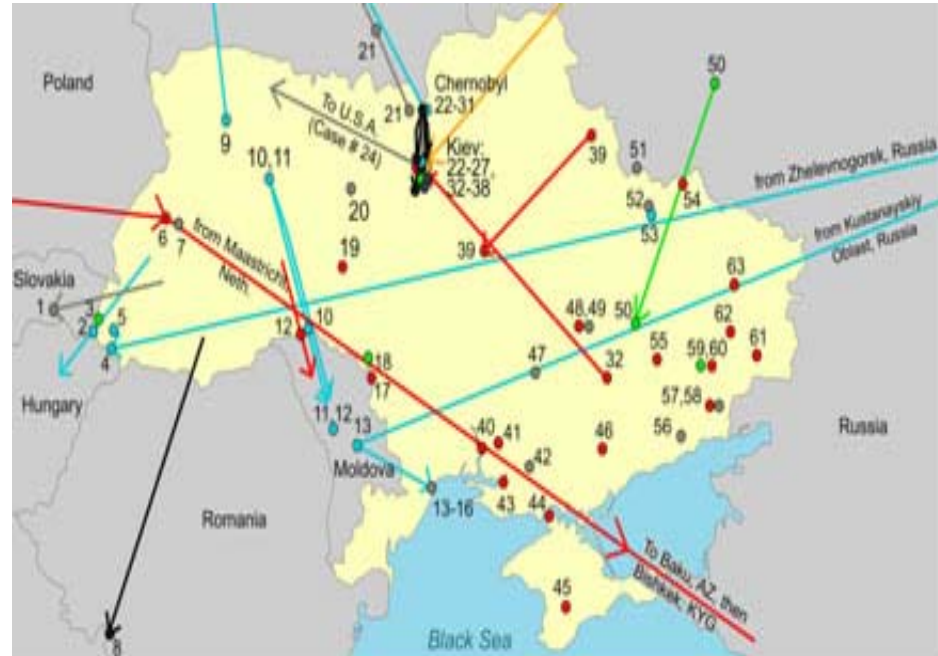
- ❑ Scrap Metal Industry
 - ❑ Trade protection
- ❑ Radioactive Waste Management
 - ❑ Material exemption/clearance
- ❑ Homeland Protection
 - ❑ Control, detection and disposal of radioactive sources

Neither Private Sector nor Any Single Government Agency Can Address All These Issues Alone!



Evidence of Events Across the Regions Offers Valuable Source of Information for Tracking of Illicit Transfer

DOE/NNSA's Theft And Diversion Incident Analysis System (THADIAS) was developed by Argonne for the International Radiological Threat Reduction (IRTR) Program to provide incident mapping and analysis. Using relational database and geographic information system (GIS) technology, THADIAS stores key information about radiological loss, theft, and Recovery incidents, and maps event locations and material transport route.



Timely availability of event database offers invaluable input to tracking Illicit transport of radioactive sources

“Spanish Protocol” Offers a New Paradigm to Addressing the Scrap Contamination Issues

- The Spanish Protocol has correctly recognized a need for Government-Industry collaboration**
 - Collaboration that reduce the barriers between regulators and private sector**
 - Standardization of the approach to preventing source contamination**
 - Cooperation from the metal industry**
 - Coordination and resource commitment from the Government Sector (multi-agency approach)**

Beyond The Spanish Protocol – What's Next?

FURTHER COLLABORATIONS ARE WARRANTED TO INTEGRATE COMMON INTERESTS ON SCRAP METAL MONITORING: TRADE, WASTE MANAGEMENT AND HOMELAND PROTECTION

■ Metal Industry's Perspectives

- Improved Source Propagation and Collection
- Improved detection technology and training
- Improved Financial Security against Contamination (e.g., government endorsed insurance)

■ Government Perspectives

- Collaboration with industry and across agencies
- Timely incident event reporting to assist homeland protection
- Improved public perception on issues such as clearance

■ International Perspectives

- Implement UNECE recommendations
- Promote cooperation among nations