Slovenian System
for Protection against Illicit Radioactive Material in Scrap Metal Shipments

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The Problem
Lost or forgotten sources

- Somebody stopped using them ...
- ... and has forgotten about them,
- Or somebody intentionally illegally trafficked with them!
What was found in scrap in Slovenia?

Diff. items, including NORM (Ra-226)
- 80%

Sources from industry (mainly Co-60 in Cs-137)
- 12%

Lightning rods (Eu-152/154, Co-60)
- 6%

Others (Th-232,..)
- 2%

Many imported from abroad!
Specific Slovenian problem
Protection until 2008

- Handheld pagers (Customs, Police)
- Co-operation between police-customs-nuclear inspection
- Portal monitors at two border crossings
Import from the East
Import from the East

CSRAO: Central storage for RW
Transit through Slovenia
Import -> Export
Rejection and reuse in Slovenia – worst case
Search for the solution

- Should be simple
- Should be cheap for the state budget
- Should be attractive for users
- "Polluter pays" principle should be applied
- Options
  - Portal monitors at all border crossings
  - Use of resources of interested stakeholders
Solution for domestic problems

Country

+ €

Scrap metal dealer

+ €

Smelter

+ €

State

Waste storage

User
Problem of foreign waste

Country A

User

Scrap metal dealer

State

Waste storage

Scrap metal exporter

Country B

Scrap metal importer

Smelter

State

Waste storage

http://www.ursjv.gov.si/
The solution

New rule forcing users to measure every shipment of scrap metal before import or reprocessing
Slovenian system

- **Surveillance**
  - Rad > 50x
    - NO: Reprocessing
    - YES: Import
- **Import**
  - NO: Storage
  - YES: Shipments of waste
- **Shipments of waste**
  - YES: Return to origin
  - NO: SNSA informs authority
- **SNSA decision**
  - NO: Storage
  - YES: ARAO

- **Arrows** indicate the flow of the process.
Measurements before the import
... which prevents accumulation in our storage
Occasional measurements by authorities
Implementation

• In place since 1. January 2008
• Measurements done by authorized expert - measurer
• Expenses paid by importer/user
• Authorization of measurer done by Slovenian Nuclear Safety Administration (SNSA)
• Every imported shipment must be measured and written certificate produced
• Certificate is a condition for customs to let that shipment into the country
• Shipments in transit are not measured, but could be returned to the country of origin if rejected by destination country
• Smelters and scrap yards must measure each shipment before reprocessing
Actions

- If dose rate is more than 50% above background but less than 50 times that level:
  - **Import:**
    - SNSA informed,
    - Customs rejects import,
    - User returns to the country of origin,
    - SNSA informs authorities in the country of origin
  - **Industrial processing:**
    - SNSA informed
    - Stored in CSRAO
Actions

• Dose rate more than **50 times** the background:
  – SNSA informed, the procedure for waste removal initiated:
    • SNSA inspection goes into the field
    • Radiation protection experts check the source
    • Agency for radwaste takes it to the CSRAO
    • In the worst case the radiation accident response system initiated
  – **User bares the cost**
  – **The shipment is not automatically returned to the country of origin**
Results

- Good cooperation with the industry
- 20 authorized measurers
- Drastically smaller possibility for
  - Expensive industrial damage
  - Radiological accidents
- Less radwaste in the CSRAO
- No additional cost for state budget
- Relatively cheap solution for users – can organize themselves and optimise expenses
Measurements in 2008

- **78,605** measurements by 16 organizations reported so far. 
  ~9 measurements every hour!
- 8 measurements exceeded the limit of 50% above background but less than 50 times the background level
- No sources above 50 times the background
Conclusion

- After one year the new Slovenian System is working fine!
  - Users are happy to protect themselves
  - Authorities are happy not to bother them
  - State is happy not to spend public money
  - Everybody is more aware of the potential danger and is acting accordingly

- International agreements should make notification of countries of origin and transit mandatory!