



Authority for Nuclear Safety and
Radiation Protection

The detection and prevention of orphaned sources

Mirjam Korse (ANVS, the Netherlands)

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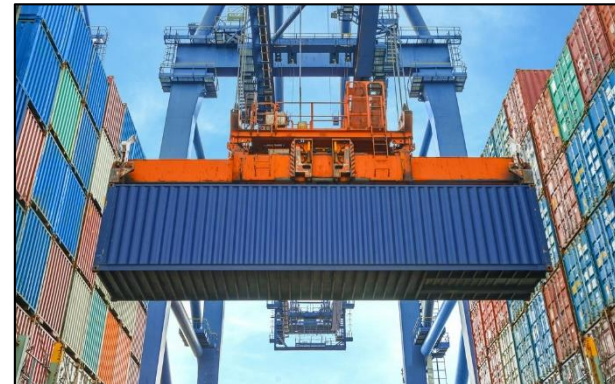




Contents

- › Events & investigation of sources
- › Regulatory framework
- › Lessons learned





Four events

- › On four separate occasions, dangerous Co-60 sources were found in scrap metal containers, shipped from Africa.
- › In the Netherlands on 13 November 2018, 28 January and 7 March 2019. Detection capabilities in the Netherlands both in the harbour and at scrap metal yards.
- › In Germany (Hamburg) on 11 January 2019. Strong Dutch-German collaboration developed to take action.
- › **Steel scrap trade in context:**
 - about 100 Million tons are traded internationally
 - about 30 Million tons of this are intra EU-28 trades.
 - EU-28: 13 to 20 Million tons exported per year
 - **EU-28: 3 Million tons imported per year**

Infographic supervision scrap metal on website:
<http://english.autoriteitnvs.nl>



- Typical activity $\sim 25\text{-}30$ GBq per source, former HASS.
- Typical dose rates close to sources ~ 5 Sv/h, on container outside surface ~ 50 mSv/h
→ IAEA 'dangerous source' category



Pre-shipment safety certificate with German shipment...



FILE N° 011/001/9

Certificate N° : RW/001/BLV.

PRE-SHIPMENT INSPECTION CERTIFICATE

I - DETAILS AS DECLARED BY EXPORTER

Shipper

Consignee

Description
Declared Origin
Port of Loading
Number of Container

ORIGINAL

This is to certify that we have inspected and attended at time of loading containers of the above consignment with the following details:

Loaded Weights **19T200KG**
Date and place of intervention : 11th Jan., 2019.

| Sl. | Container Number | Seal Number | Description | Quantity as declared | Radioactivity levels |
|-----|------------------|-------------|-----------------|----------------------|----------------------|
| 01 | MRKU 399062-8 | PADLOCK | STAINLESS STEEL | 19T200KG | 0,012mR/hr |

II - DETAILS OF TESTS CARRIED OUT: a) Visual inspection during the loading process.
b) Not radioactive check by handheld equipment using "NeutronRAE II Radiation Detector".

DECLARATION

- The consignment at column 2 above does not contain any type of arms, ammunition, mines, shells, cartridges, radioactive contaminated or any other explosive material in any form either used or otherwise.
- The impurities, radiation at column 2 above is actually metallic scrap / seconds / defective as per the internationally accepted standards for such a classification. The product is not certified in relation to any standard.
- I / We hereby declare that the particulars and statements made in this certificate are true and correct and nothing has been concealed or held there from.

This report is based on the facts observed and reported by our inspectors in attendance and is issued without prejudice to the rights of either party.





Handling of sources



- › No contamination in the Netherlands and Germany.
- › No significant exposure
- › These 3 sources were investigated together with the Dutch bomb squad.
- › In the Netherlands sources were transported to COVRA (*Central Organisation for Radioactive Waste*) for disposal.
- › In Germany source was transported to a State Collection Facility → further analysis to determine origin will follow.



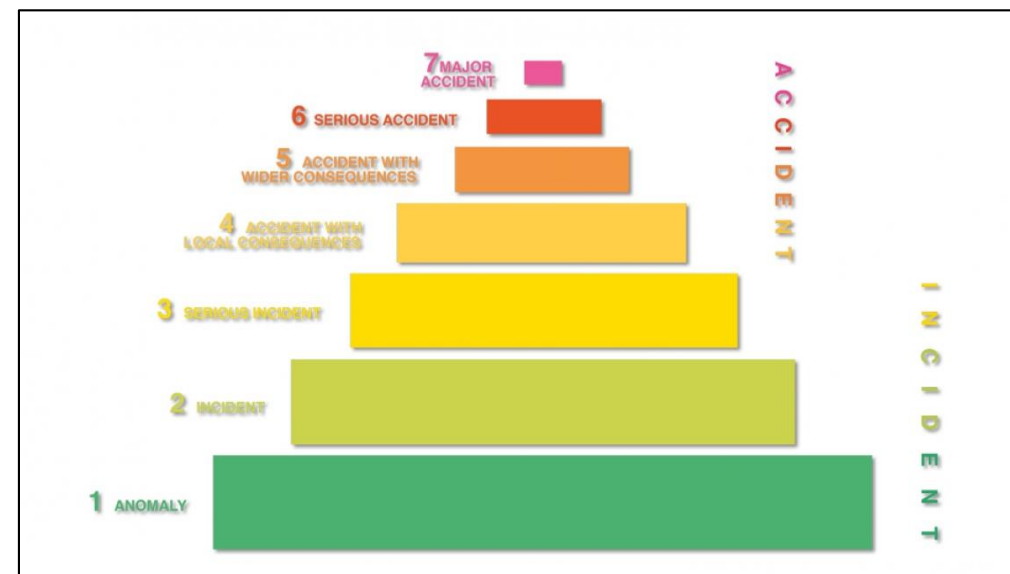
Actions & reporting

- › Suspicion that more sources may be circulating, origin uncertain (possibly a source rack)
- › ITDB and USIE reporting with IAEA
- › ECURIE reporting & conference call (19 March, 16 countries)
- › Follow-up questions on USIE and ECURIE
- › Direct contact with authorities in country of shipment to provide information
- › IAEA Fact Finding Mission was conducted in June → actions points to prevent re-occurrence are being followed up.



INES notifications (21 March 2019)

- › Simultaneous INES notifications Netherlands and Germany
- › Netherlands: INES-2 (several sources)
- › Germany: INES-1 (one source)
- › Little public response





Outlook & lessons learned

- › Continuing close cooperation between IAEA, country of shipment, Germany and the Netherlands
- › These incidents have brought to light some structural problems:
 - Certification doesn't always work properly
 - Not all sources are under regulatory control

→ Where can we strengthen the regulatory framework in this regard?
- › Despite improvements in regulations, older sources can still be problematic.
- › Early reporting, adequate response in countries concerned and IAEA involvement are essential.