TRANSBOUNDARY MOVEMENT
OF RADIOACTIVELY CONTAMINATED
SCRAP METAL

Prevention, Detection and Response - Lesson Learned

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CONTENT OF THE PRESENTATION

- EVENTS WITH RADIOACTIVELY CONTAMINATED SCRAP METAL

- STRUCTURE OF THE METAL RECYCLING SECTOR IN THE REPUBLIC OF BULGARIA

- CHALLENGES FOR THE STATE AND THE BUSINESS (ORGANISATIONAL, OPERATIONAL, FINANCIAL, ETC.)

- PREVENTION, DETECTION AND RESPONSE
  - Regulatory approach
  - Business approach

- LESSON LEARNED

- GOOD PRACTICES
SUMMARY:

• Over 70 % of the events are related to the discovery of:
  – Radioactive sources and material, which had been accidentally collected with the scrap metal (these are usually appliances or parts covered with luminous fluorescent paint containing $^{226}\text{Ra}$ or $^{232}\text{Th}$)
  – Equipment and elements of uranium production or
  – Equipment and elements containing high concentration of naturally occurring radionuclides (not from uranium production)

• Remaining 30 % of the events are related to detection of radioactive sealed sources, which were lost, found (orphan sources), stolen, illicit trafficking, etc.
EVENTS IN BULGARIA WITH RADIOACTIVE MATERIALS

- 127 metal scrap (Ra & U-mining)
- 30 metal scrap - radioactive sources - Cs-137, Co-60, Kr-85, Sr-90 and others)
- 13 during operation
- 15 orphan sources
- 1 non-authorised transport
- 3 innocent alarms
- 13 thefts
- 3 illicit trafficking
- 7 transboundary metal scrap

Totally: 212 events per 11 years (1998 – 2008)
Control & Management of Inadvertent Radioactive Material in Scrap Metal, Tarragona, Spain, 23 - 27 February 2009

**EVENTS WITH RADIOACTIVELY CONTAMINATED SCRAP METAL**

* The event happened in 1994 and this was the first detected event of transboundary movement

**Number of events in Bulgaria for the period 1998 - 2008**

- Natural Ra/Th/U (Total Number 127)
- Transboundary (Total Number 7+1*)
- Radioactive Sources (Total Number 30)

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* * The event happened in 1994 and this was the first detected event of transboundary movement

Control & Management of Inadvertent Radioactive Material in Scrap Metal, Tarragona, Spain, 23 - 27 February 2009
Structure of the metal recycling sector in the Republic of Bulgaria

Import/Export countries: France, Italy, Serbia, Poland, Greece, Albania, Tunisia, Cyprus, Switzerland, Slovenia, Romania, England, Turkey, Macedonia, etc.
### Metals plants end users

<table>
<thead>
<tr>
<th>Ferrous metals plants:</th>
<th>Non-ferrous metals plants:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kremikovtsy, Sofia</td>
<td>5. KCM, Plovdiv</td>
</tr>
<tr>
<td>2. Stomana Industry, Pernik</td>
<td>6. Umicore Copper, Pirdop</td>
</tr>
<tr>
<td>3. Promet Steel, Burgas</td>
<td>7. OCK, Kardjali</td>
</tr>
<tr>
<td></td>
<td>9. Alucom, Shoumen (Al)</td>
</tr>
<tr>
<td></td>
<td>10. Alcomet, Pleven (Al)</td>
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<tr>
<td></td>
<td>11. Supersplav, Plovdiv</td>
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<td></td>
<td>12. Sofia Med, Sofia</td>
</tr>
<tr>
<td></td>
<td>13. Kurilo Metal, Novi Iskar</td>
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</tbody>
</table>

[Map showing locations of metals plants in Bulgaria]
### CHALLENGES FOR THE STATE AND THE BUSINESS  
**(ORGANISATIONAL, OPERATIONAL, FINANCIAL, ETC.)**

<table>
<thead>
<tr>
<th>ORGANISATIONAL</th>
<th>For the STATE</th>
<th>For the BUSINESS</th>
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<tbody>
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<td></td>
<td>- Different state authorities involved with different competences</td>
<td>- Significantly fragmented business</td>
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<td>- Changes in the legislation – clear definition of field control responsibilities</td>
<td>- Development of emergency procedures</td>
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<td>- Development of joint emergency response procedures</td>
<td>- Changes in the contracts</td>
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<td>- Redefinition of border check-points due to joining EU – replacement of monitoring equipment</td>
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<td>- Cooperation with other countries</td>
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<td>- Some staff not concern to the radiation protection and risks</td>
<td>- Sector not concern to the radiation protection and risks</td>
</tr>
<tr>
<td></td>
<td>- Lack of place at the smaller border check points – limited possibility to mount portal detectors</td>
<td>- Small and middle scrap metal yards with manual handling</td>
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<td>- Radiation monitoring thechnics – the metal act as a radiation shield</td>
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</table>
### CHALLENGES FOR THE STATE AND THE BUSINESS (ORGANISATIONAL, OPERATIONAL, FINANCIAL, ETC.)

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<td><strong>FINANCIAL</strong></td>
<td>- Additional expenditures for:</td>
<td>- Large number of small scrap metal yards with limited financial resources</td>
</tr>
<tr>
<td></td>
<td>• Training material</td>
<td>- Large potential financial losses in case of incident</td>
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<td></td>
<td>• Posters, brochures, etc.</td>
<td>- Investments in radiation monitoring equipment</td>
</tr>
<tr>
<td></td>
<td>• National seminars</td>
<td>- Investments in training of the staff</td>
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<tr>
<td></td>
<td>- Additional financial resources for replacement of monitoring equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Investmants in radiation monitoring equipment</td>
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PREVENTION, DETECTION AND RESPONSE

- Regulatory approach:
  - at law level (Act on the Safe Use of Nuclear Energy)
  - at secondary legislation level
  - Decision for developed a special guidance directed to the sector
  - licensing the companies performed radiation monitoring of metal scrap
  - Installation of portal monitors at borders
  - Maintaining inter-institutional emergency response team
PREVENTION, DETECTION AND RESPONSE

- Business approach:
  - Scrap delivery contract
  - Declaration provided by the suppliers – no radioactive contamination
  - Supplier is considered to be the owner if there is radioactively contaminated scrap
  - Developing Emergency Plan/Procedures
  - Performing radiation monitoring
  - Installation of portal monitors
LESSON LEARNED

1. Clear allocate the responsibilities of involved organisations

2. Special guidance for prevention, detection and response
   - Training the staff

3. Radiation monitoring equipment
   and emergency response plans or procedures should be developed
   - Training the staff
   - Drills
Good practices

• The state faced with good understanding and acceptance by the sector of the state policy related to radioactively contaminated scrap
  • detection
  • response

• The state allocated clearly the involved organizations and their responsibilities

• Good co-operation and trustworthy between the state and the sector

• Cooperation with neighbor countries

• The state developed a guide and distributed it to the sector

• The state (NRA) performed courses