Regulatory control of transport of radioactive material in Finland

TRANSSC 30
16.6.2015
Santtu Hellstén
...but where is Finland?
How is transport regulated?

• The basis of Finnish legislation is on the ADR, RID, IMDG Code and ICAO-TI that all contain the requirements of the IAEA SSR-6

• The most important laws and decrees are:
  – Act on Transport of Dangerous Goods (719/1994)
  – Modal Decrees (4)
  – Order of the Finnish Transport Safety Agency on Transport of Dangerous Goods by Road (TRAFO/586/03.04.03.00/2014)
  – Nuclear Energy Act (990/1987)
  – Nuclear Energy Decree (161/1988)
  – Radiation Act (592/1991)

• Transport regarded as use of radiation / nuclear energy in
  – Nuclear Energy Act and Decree (licensed)
  – Radiation Act (exempt from license)

• Ministry of Transport and Communications has recently started the process to review the transport of dangerous goods legislation
The role of STUK as a regulatory body

- use of nuclear reactors
- nuclear waste and materials
- use of radiation incl. transport
- monitoring environment
- mining
- non-ionising radiation
STUK organisation

Director General

Public Affairs

Nuclear reactor regulation

Nuclear waste and material regulation

Radiation practices regulation

Environmental radiation surveillance and emergency preparedness

Administration

Number of staff at the end of 2014: 342
Authorities and the role of STUK in transport

- STUK oversees the radioactive material transports in cooperation with police, Finnish Transport Safety Agency, Customs and Border Guard
- STUK grants the approvals in class 7 issues when required by the legislation
- STUK is
  - the competent authority for class 7 transports in all transport modes
  - responsible for the regulatory control of the use of nuclear energy and the use of radiation
- STUK grants the licenses for nuclear material and nuclear waste transports (nuclear energy act)
  - a license is needed with some exceptions for small amounts
  - for non-nuclear radioactive material no transport license is required
Nuclear power plants in Finland

**Fennovoima Ltd**
- New utility, no operating reactors
- Decision in Principle (DiP) for FH1 (Hanhikivi Site), SF storage

**Olkiluoto NPP (TVO)**
- 2 operating units - ABB BWRs
- OL3 (EPR) under construction
- DiP approved for OL4
- Interim Spent Fuel Storage
- L/ILLW repository
- Posiva SF repository site “Onkalo”

**Loviisa NPP (Fortum)**
- 2 operating units – VVERs
- Interim Spent Fuel Storage
- L/ILLW repository

FiR1 research reactor in Espoo
To be decommissioned

Photo: TVO

Photo: Fortum

SÄTEILYTURVakeskus • STRÅLSÄKERHETSCENTRALEN
RADIATION AND NUCLEAR SAFETY AUTHORITY
# Radiation devices in industry, research and education (2007)

<table>
<thead>
<tr>
<th>Appliances/laboratories</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appliances containing radioactive substances</strong></td>
<td></td>
</tr>
<tr>
<td>• level switches</td>
<td>2296</td>
</tr>
<tr>
<td>• continuous level gauges</td>
<td>1138</td>
</tr>
<tr>
<td>• density gauges</td>
<td>1027</td>
</tr>
<tr>
<td>• radiography appliances</td>
<td>19</td>
</tr>
<tr>
<td><strong>X-ray appliances and accelerators</strong></td>
<td></td>
</tr>
<tr>
<td>• X-ray screening appliances</td>
<td>394</td>
</tr>
<tr>
<td>• radiography appliances</td>
<td>340</td>
</tr>
<tr>
<td>• diffraction and fluorescence analyzers</td>
<td>260</td>
</tr>
<tr>
<td><strong>Radionuclide laboratories</strong></td>
<td></td>
</tr>
<tr>
<td>• A-type laboratories</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
High-activity sealed sources in industry, research and education (2007)

<table>
<thead>
<tr>
<th>Radionuclide</th>
<th>Number of sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-activity sealed sources</strong></td>
<td></td>
</tr>
<tr>
<td>Cs-137</td>
<td>64</td>
</tr>
<tr>
<td>Co-60</td>
<td>16</td>
</tr>
<tr>
<td>Ir-192</td>
<td>12</td>
</tr>
<tr>
<td>Am-241 (gamma sources)</td>
<td>8</td>
</tr>
<tr>
<td>Sr-90</td>
<td>5</td>
</tr>
<tr>
<td>Am-241 (AmBe neutron sources)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>109</strong></td>
</tr>
</tbody>
</table>
What is transported in Finland?
- Nuclear Material

• A limited amount of fresh fuel transported each year, appr. 4 times a year
  – Transports require a license from STUK
  – By sea/road or rail/road
• Currently, spent fuel in wet storage on site
• Transports of spent nuclear fuel will increase in coming years when the final repository becomes active in Olkiluoto
What is transported in Finland?
- Non-nuclear RAM

• STUK conducted a survey on the amount of radioactive material transported on road in Finland in 2013.
  – About ~23 000 packages per year
  – Large part medical isotopes
  – Questionnaire sent to licensees (use of radiation)
  – Major carriers and transport hubs were identified in the study.
  – Collective doses to workers were estimated.
  – The survey is repeated every 5

<table>
<thead>
<tr>
<th>Material</th>
<th>Number of packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excepted packages</td>
<td>10 900</td>
</tr>
<tr>
<td>Type A</td>
<td>11 400</td>
</tr>
<tr>
<td>Type B</td>
<td>150</td>
</tr>
<tr>
<td>LSA and SCO</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>~23 000</td>
</tr>
</tbody>
</table>
What is transported in Finland?
- Non-nuclear RAM

• Practically all sources come through Helsinki Airport
  – Larger sources are transported through northern Sweden
• STUK conducted a survey on maritime transports of radioactive material in Finland in 2012.
  – Questionnaire sent to Finnish companies
  – virtually no non-nuclear RAM maritime transports in Finland
• Basically no rail transports
• Very little package manufacturing, e.g. no Type B
• No specialised class 7 carriers
  – Can be up to 3 levels of subcontracting
What does STUK do then?

• Sets the regulatory requirements for the use of nuclear energy and radiation;

• Conducts inspections of transport arrangements (nuclear and other radioactive material) and single transports (nuclear material)
  — safety and security measures are inspected at the same time
    • Packages, markings, documents, training, ...
    • Mainly licensees, 3 – 5 year intervals
  — cooperation with police (mainly nuclear material)
  — Other authorities e.g. Transport Safety Agency (air)

• Reviews management systems and radiation protection plans

• Grants the approvals in class 7 issues when required by the legislation
  — e.g. validation of package design

• International co-operation: is a member of the Europen Association of the Competent Authorities (EACA) for the transport of radioactive material
Activities of STUK

- STUK approves plans for safety, security and emergency preparedness (nuclear material transports)
  - for nuclear material such as fresh fuel, also a transport plan and transport security are mandatory in addition to the license

- Guidance issued:
  - Requirements for road transport (to be updated for ADR 2015)

- Guidance to be issued
  - Security in transport: 2015
  - Training (2015)
  - Radiation protection plans (2016)

- A plan for regulatory control for the coming years exists
Thank you!

(Airport can be a dangerous place for a package...