European Union legislation

High-activity sealed sources (HASS) Directive introduced additional controls on sources and requires member states to provide system for orphan sources:

- Defines HASS
- Requires users to prevent unauthorized access, loss or theft
- Detailed requirements for control over aspects of use of HASS and disposal at end of life
Implementation of HASS Directive in UK

- Implemented in UK by HASS Regulations 2006
- Additional detailed requirements on security introduced in UK at that stage:
  - Requires security to be “adequate”
  - Permits issued by the regulator to keep or use HASS and other sealed sources in categories 1 to 4 include requirement to meet UK security standard
  - UK security standard specified as UK Security Book
Environmental Permitting Regulations 2010
Radioactive Substances Act 1993

- In England and Wales HASS 2005 Regs replaced by EPR 2010
- RSA93 (amended) and HASS Regs in Scotland and NI
- Standard the same across UK
- This is the enforcement platform for HASS and security, as well as safety
Permit applications

As part of application process for sealed source permits in categories 1 to 4:

- the security level of the premises is set by the category of the sources
- Security measures in place are assessed by the police Counter Terrorism Security Officer (CTSA) who advises regulator
- Any improvements needed are identified

Security must be adequate before permit issued, but can still be subject to improvements
Regulators and CTSAs

- CTSAs are police (can be either civilian staff or Officers) who have had special training in security and intro to radiological matters.
- Work for individual police forces but NaCTSO co-ordinates radiological work.
- Regulators have radiological knowledge but little security training.
- Need to work together to get best outcome.
Regulators and CTSAs

The regulator has responsibility for ensuring that security is obtained through permit conditions.

Security does require judgments to be made about whether something is adequate.

CTSAs advise, the regulator enforces.
Permits

- Once regulator is satisfied with all requirements, including security, permit issued
- Permits require compliance with Security Book standard and notification of changes which could affect security: eg a number of small sources could aggregate to a higher security category
- Permits are classified as “Restricted”
- Regulators need to check that improvement conditions have been met – seek confirmation from CTSA if necessary
<table>
<thead>
<tr>
<th>Category</th>
<th>Description of Practice (see Security Book for details)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medical teletherapy except Sr-90 eye plaques</td>
</tr>
<tr>
<td></td>
<td>Irradiators</td>
</tr>
<tr>
<td>2</td>
<td>Industrial radiography</td>
</tr>
<tr>
<td></td>
<td>Brachytherapy – radionuclide and activity specific</td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td>Gauges</td>
</tr>
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<td></td>
<td>Bone densitometry</td>
</tr>
<tr>
<td></td>
<td>Brachytherapy – radionuclide and activity specific</td>
</tr>
<tr>
<td>5</td>
<td>Any practice with A/D &lt; 0.01 (except above)</td>
</tr>
</tbody>
</table>
Other sources

Permits issued for category 5 sources alone and open/unsealed sources continue to require sources to be looked after but are outside the security regime.
The Orphan Source problem

- Almost always below HASS
- Usually end up in scrap metal consignments
- May be detected at scrapyards
- Often stored for long periods in unsafe areas
- May easily be lost, stolen or damaged
- No clear incentive for proper disposal
Orphan source origins

- Insolvency of source users
- Import in scrap metal
- Legacy radioactive materials
  - Radium luminised equipment
  - Thorium castings and welding rods
  - NORM contaminated equipment
Orphan source hazards

- Loss of control leading to public exposure
- Damage leading to public exposure and environmental contamination
- Malicious acts leading to public alarm and distress, exposure and contamination
- Massive clean up costs
- Not all orphan sources are significantly hazardous – eg domestic smoke detector
The scrapyards!
UK solution – work in progress

- All major scrapyards now have gate monitors
- Surveyed the 90 largest scrapyards (2013)
- 18 had “sources” – 500 items in total
- 8 sources >10MBq (lightning preventers)
- Many Ra luminised instruments
- Regulator is funding disposal of all items
- Disposal should be completed this year
UK solution – the future?

- Fund disposal of all radioactive items as incentive to report
- Use scrapyards to intercept orphan sources
- Provide free access to Radiation Protection Advisor
- No permit likely – regulatory agreement
- Agreement to include, monitoring, reporting, safe storage, staff training
- Central Government funding needed