

ONR Transport Safety

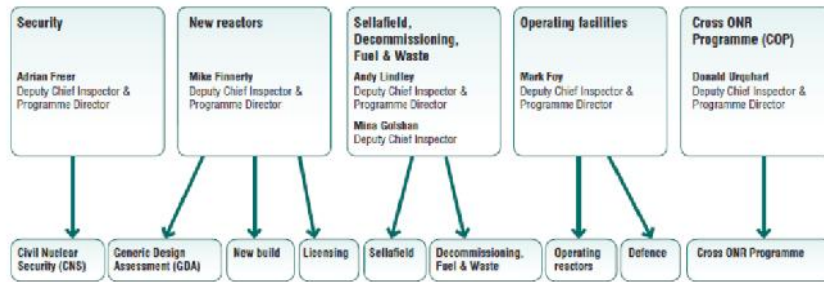
Dounreay Stakeholder Group September 2016

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Professional Lead

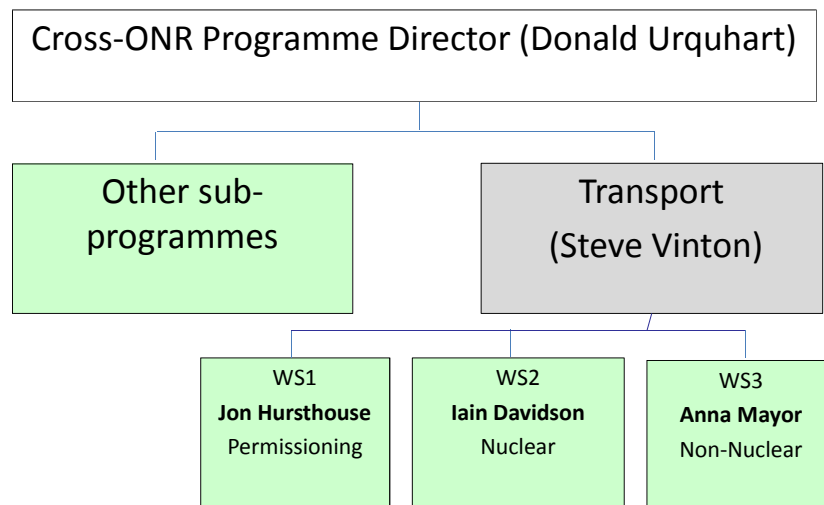
Presentation will cover:

- Transport Safety Regulatory Framework including tests necessary.
- How ONR assesses Transport safety cases and conducts Transport Interventions.
- Transport Safety Studies.

ONR Operational Programmes



Who Are Transport?



Competent Authorities

- ONR is one Competent Authority
 - Civil carriage (by land) of Class 7 goods
 - i.e. Road and Rail in GB (inland waterway is complicated)
- Other GB / UK Class 7 Competent Authorities exist!
 - SoS Transport (Maritime and Coastguard Agency)
 - Civil Aviation Authority
 - SoS Defence
 - DoE Northern Ireland
- As do other Dangerous Goods Competent Authorities
 - Department for Transport
 - Health and Safety Executive

Transport Regulations Codification – why?

- Transport is an international business
- Common standards adopted to enable international trade whilst maintaining internationally agreed standards of safety
- Graded approach to safety
- Generally prescriptive

IAEA SSR-6

National, Modal and International
Regulations are based on:
IAEA Specific Safety Requirements
No. SSR-6

Regulations for the Safe Transport
of Radioactive Material
2012 Edition

IAEA Safety Standards

Regulations for the
Safe Transport of
Radioactive Material
2012 Edition

Specific Safety Requirements
No. SSR-6

IAEA
International Atomic Energy Agency

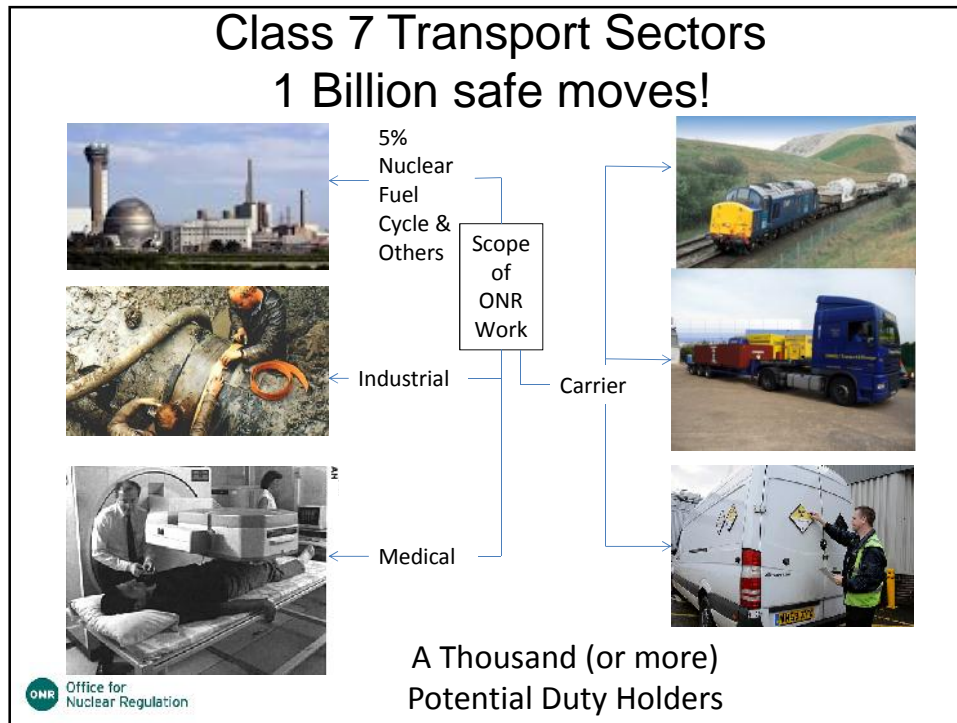
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Basic Safety Requirements

- Containment of the radioactive contents
- Control of external radiation levels
- Prevention of criticality
- Prevention of damage caused by heat



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Medical – generally non-CA approved

- SFRAM – approved by CAs – teletherapy and sterilisation (Co-60).
- Brachytherapy – Ir-192 wire implants
- Therapeutic (pain relief):
 - Sr-89; Sm-153; and Re-156 for bone cancer
- Radioisotopes 'tracers' for diagnostics:
 - Tc-99 – 80% of all Nuc medicine procedures (30m/y)
 - I-131 - thyroid disease
 - F-18 – PET scan ($t_{1/2}$ is 2 hours!)

Etc (200 radioisotopes used!)

Come from reactors in Canada, Netherlands, Belgium, France, South Africa, Australia etc.

What is Transport?

For the purposes of the IAEA Transport Regulations (SSR-6 para 106),

TRANSPORT

comprises all operations and conditions associated with, and involved in, the movement of radioactive materials. These include the

DESIGN, MANUFACTURE, MAINTENANCE AND REPAIR OF
PACKAGING
and the

PREPARATION, LOADING, CONSIGNING, CARRIAGE
INCLUDING IN-TRANSIT STORAGE), UNLOADING AND
RECEIPT AT FINAL DESTINATION OF LOADS OF RADIOACTIVE
MATERIAL AND PACKAGES.

Also known as 'Carriage' in some regulatory texts

Other Relevant Documents

Transport Specific:

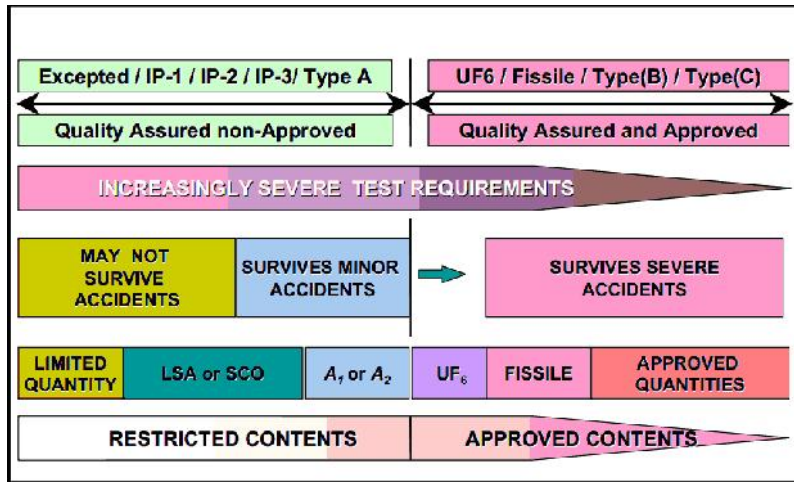
- IAEA TS-G-1.1 (Advisory Material)
- IAEA TS-G-1.2 (Emergency Response)
- IAEA TS-G-1.3 (Radiation Protection Programmes)
- IAEA TS-G-1.4 (Management Systems)
- IAEA TS-G-1.5 (Compliance Assurance)
- IAEA TS-G-1.6 (Schedules of Provisions)
- DETR/RMTD/0003 (Applicant's Guide)
 - drawing its pension – needs updating

Generic:

- IAEA SF-1 (Safety Fundamentals)
- IAEA GSR Part 1 (Governmental, Legal & Regulatory Framework for safety)
- IAEA GS-R-3 (Management Systems) (under review)
- IAEA GSR Part 3 (BSS)



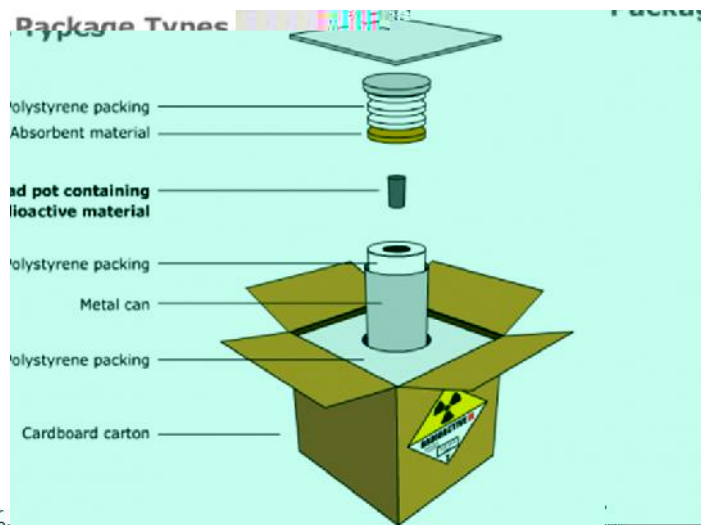
Fundamental Safety Approach



Graded approach linking contents hazard potential to required package integrity and required regulatory approval



Typical Excepted/Type A



TYPE A Fissile

New Fuel – AGR GB/3575



The fuel elements of an AGR are comprised of 36 pins containing small pellets containing uranium built into a graphite sleeve. Seven or eight fuel elements are fixed together vertically by a tie bar which passes through the centre of the elements to form a fuel stringer. A plug unit is attached to the top of the stringer to form a complete fuel assembly. An assembly is placed into each of the standpipes, so that the fuel elements are positioned within the graphite core's fuel channels and are then sealed in by the plug unit.

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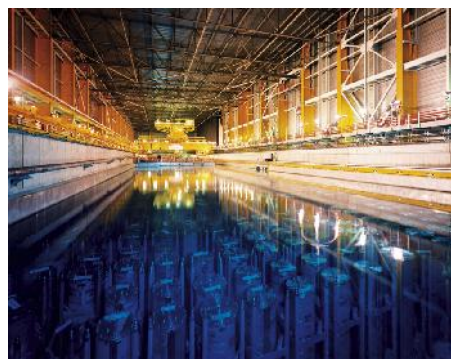
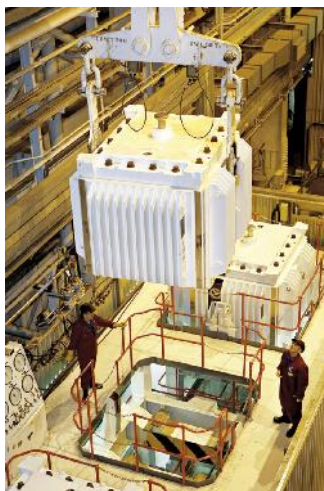
<http://www.innuserv.com/>

<http://www.westinghousenuclear.com/springfields/Products>



TYPE B Fissile

The Stations – EDFE NGL - AGR



Copyright © Sellafield Ltd

<http://www.sellafieldsites.com/solution/spent-fuel-management/ongoing-receipt-of-agr-fuel/>



Type B Fissile

<http://www.innuserv.com/unique-capabilities/#Transport>



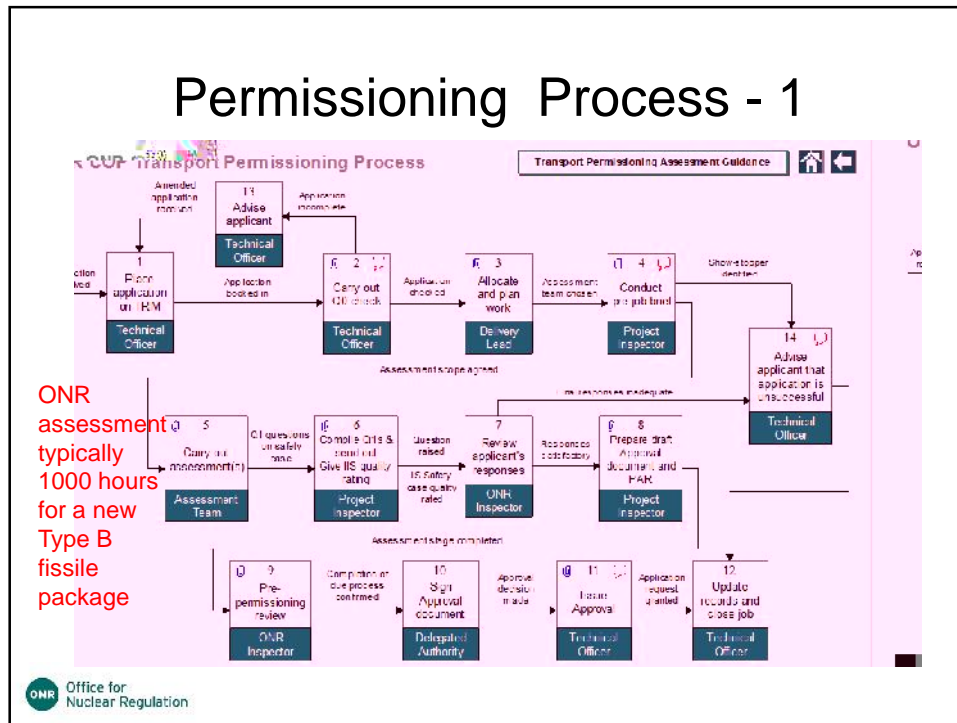
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What are ACT?

- [9m drop test](#)
- [Penetration test – 1m drop on 0.2m bar](#)
- [Thermal test – 800°C all engulfing fire, 30mins](#)
- Water immersion test – 200m for high activity packages.
- Packages must continue to remain essentially leak-tight, provide significant shielding and avoid going critical.

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Permissioning Process - 1



Inspection and Enforcement

- **Purpose** - Hold duty holders to account on behalf of workers and the public
- **Focus** – Duty holders must comply with the law, but we need to focus on what can 'hurt' people – targeting and proportionality
- **Standards** – CDG/ADR/RID etc. – we only require what the law requires
- **Inspections** – Informed by our judgement of risk and compliance - inspect and intervene accordingly (targeting)
- **Enforcement** – We want duty holders to comply, but will enforce if needs be – nature of enforcement reflecting compliance risk gap, and mitigating/ aggravating factors



Safety Studies

- ONR Events report 2001 to 2015
- Looks at type of incidents.
- <http://www.onr.org.uk/documents/2016/events-reported.pdf>
- Ministerial Reporting
- <http://www.onr.org.uk/quarterly-stat/index.htm>
- PHE/HPA/NRPB reports for Road, Rail, Sea and Air
- Look at doses.
- <http://www.onr.org.uk/transport/guidance.htm>

NRPB 2005. Survey into the radiological impact of the normal transport of radioactive material in the UK by road and rail.

Abstract:

- Half a million UK packages/year
- Most for industrial, research and medical use.
- Dose to most Transport workers <1mSv/y
- Doses to public at least an order of magnitude smaller <20microSv/y