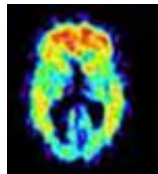


The Management of Radioactive Waste from the Nuclear Medicine Sector

Peter Hayes

This is GE Healthcare



Medical
Diagnostic
s

From Organ to Cellular

- Contrast Agents
- Nuclear medicines & diagnostics
- Molecular Diagnostics



Diagnostic
Imaging

From Anatomical Imaging to Molecular
Imaging

- CT, PET/CT
- MR
- X-ray



Services

From Maintenance to Hospital
Productivity

- Performance Solutions
- Multi-Vendor Services
- Asset Management



Life
Sciences

From Molecular Discovery to Clinical
Application

- Discovery Systems
- Radiolabelling
- Protein Separations



Clinical
Systems

From Modular, Hard Wired to
Miniaturization and Connectivity

- Ultrasound
- Critical Care Systems
- Anaesthesia Systems



Information
Technology

From PACS to Clinical IT Systems

- PACS
- RIS
- HIS
- CIS...

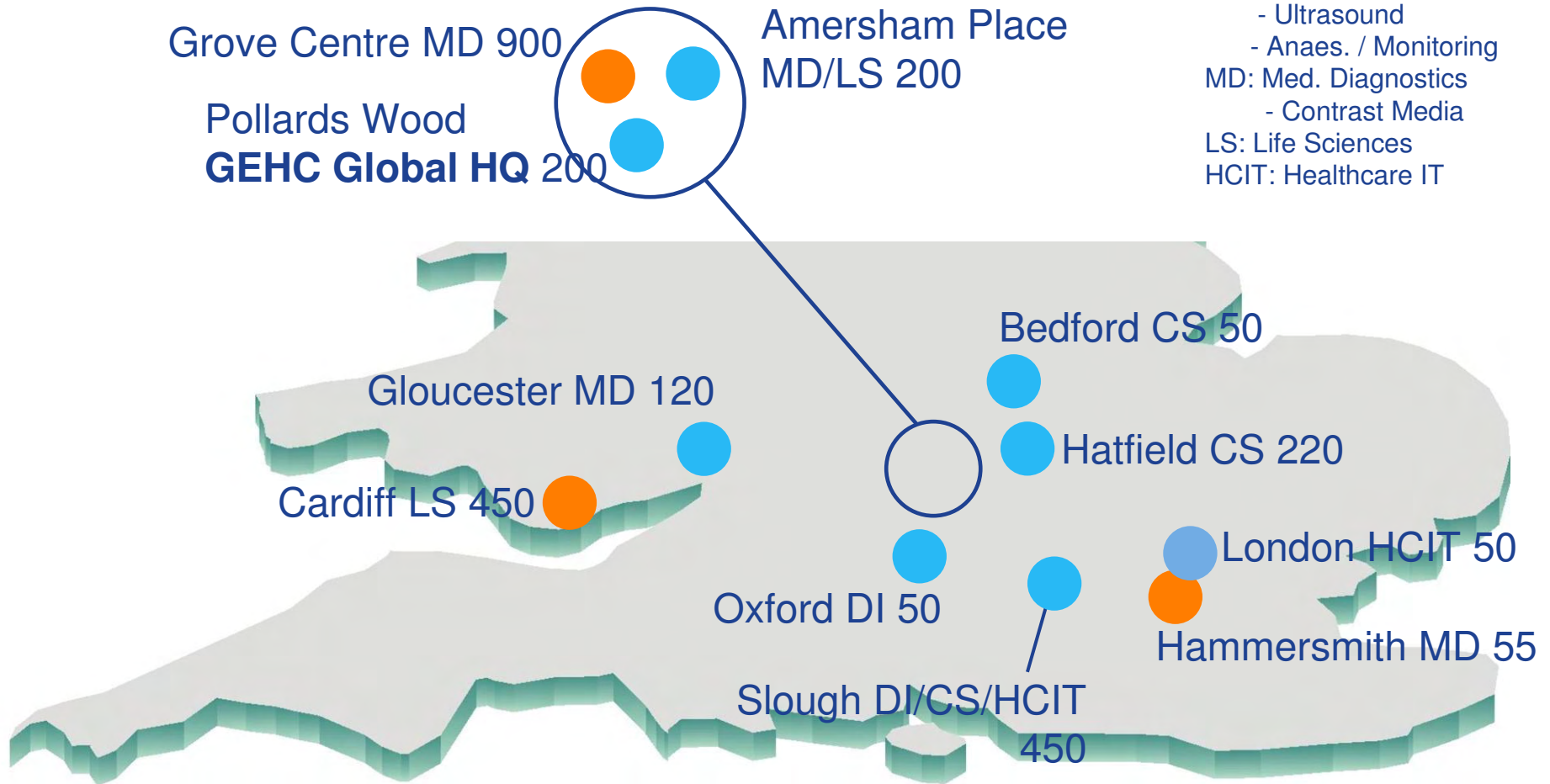


imagination at work

GE Healthcare UK

~ 2,700 multi-disciplinary staff across the country

**# Employees
by Business Unit**
DI: Diagnostic Imaging
CS: Clinical Systems
- Ultrasound
- Anaes. / Monitoring
MD: Med. Diagnostics
- Contrast Media
LS: Life Sciences
HCIT: Healthcare IT



Radioactive Waste Categories

Very low-level wastes (VLLW)	Low-level wastes (LLW)	Intermediate-level wastes (ILW)	High-level wastes (HLW)
Can be disposed of with ordinary refuse.	Cannot be disposed of with ordinary refuse.	Heat does not need to be taken into account in designing storage disposal / facilities.	Heat must be taken into account in designing storage / disposal facilities.
<p>Each 1 m³ contains less than 4 MBq of β/γ activity.</p> <p>Single item contain less than 40 kBq.</p> <p>Authorisations can relax the C-14 and H-3 concentration limits by factor 10.</p>	Not exceeding 4 GBq per tonne of alpha activity, or 12 GBq per tonne of beta/gamma activity.	Wastes exceeding LLW limits	Wastes whose temperature may rise significantly as a result of their radioactivity.

Radioactive Waste Regulation

Safety of workers and the general public

The main legislation covering the safety of workers and the general public at nuclear installations in the UK is the Health and Safety at Work etc Act 1974 The Nuclear Installations Act 1965 (as amended) and the Ionising Radiations Regulations 1999. These are enforced by HSE.

Radioactive waste management on nuclear licensed sites

The way in which radioactive waste is managed on licensed nuclear sites is set out in the conditions attached to the nuclear site licence and is enforced by HSE.

Disposal of radioactive waste from nuclear licensed sites

The disposal of radioactive waste, including airborne and liquid discharges from sites and transfers of waste between sites, is regulated by the EA and SEPA in Scotland, under the Radioactive Substances Act 1993 and the Environment Act

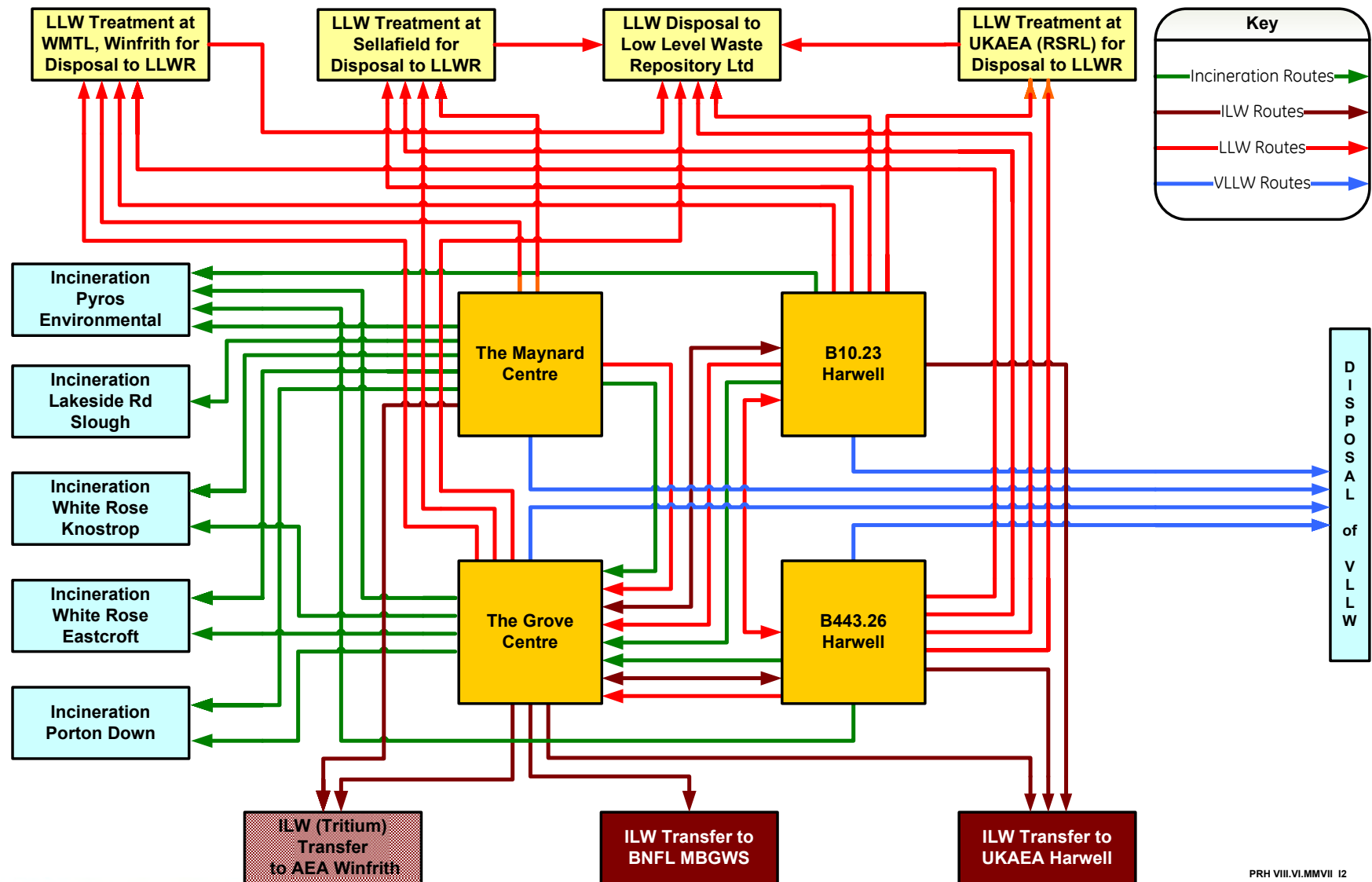
Transport of radioactive waste

The Competent Authority in the UK for approving packages for transporting radioactive material Department for Transport.

Security

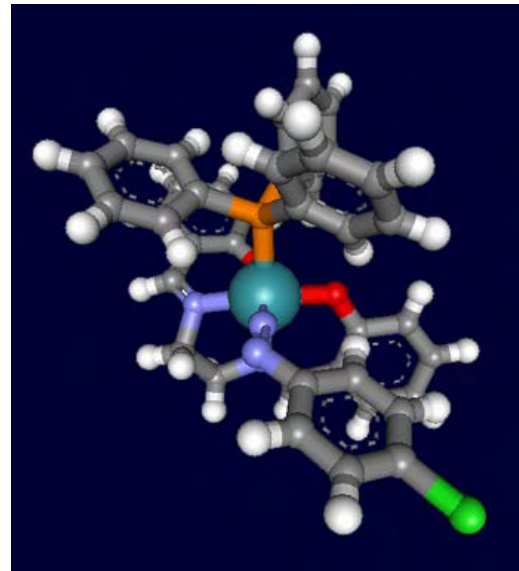
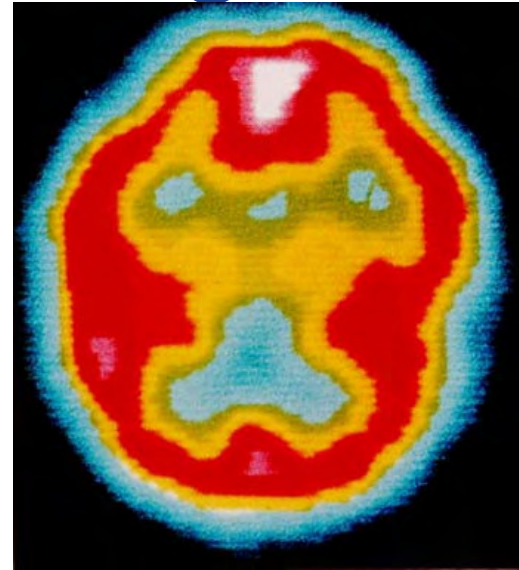
The Nuclear Industries Security Regulations 2003 aim to ensure the security of nuclear material and related equipment and information, and are enforced by OCNS.

GE Healthcare's Waste Routes



Radioactive Waste Arisings

Manufacturer of a range of radioactive pharmaceutical & life science products, resulting in production of LLW



Radioactive Waste Arisings

Manufacturer of a range of radioactive pharmaceutical & life science products, resulting in production of LLW

Legacy wastes from past radioactive manufacturing operations



Radioactive Waste Arisings

Manufacturer of a range of radioactive pharmaceutical & life science products, resulting in production of LLW

Legacy wastes from past radioactive manufacturing operations

Decommissioning waste from redundant plant and buildings is a significant proportion of total arisings



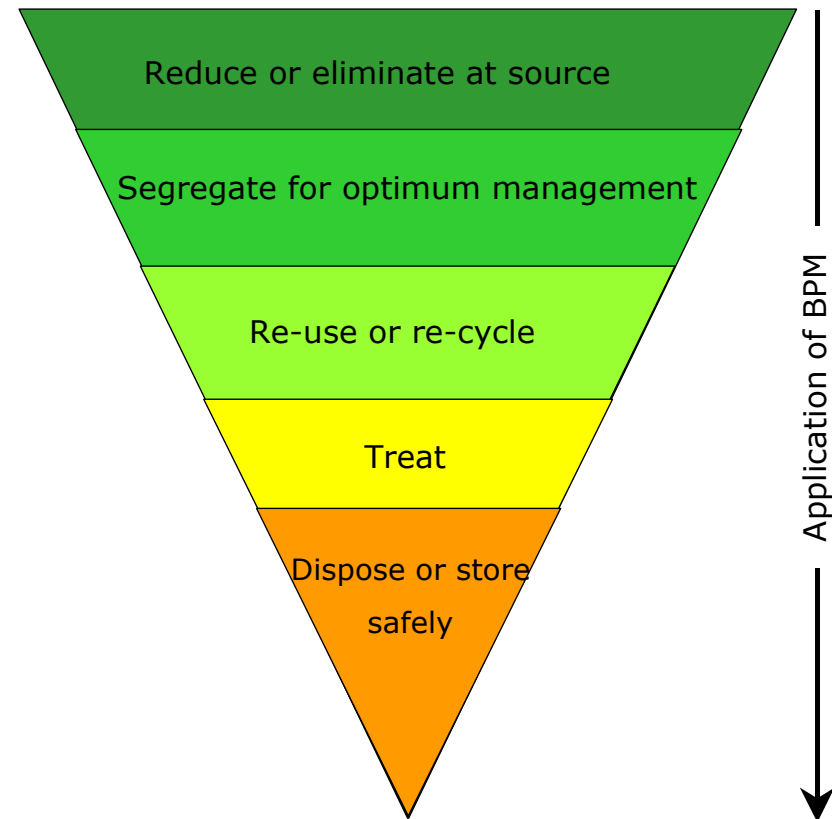
Operational Considerations

GE Healthcare waste & decommissioning costs are fully provided for

Waste costs form a significant portion of the provision

Application of Best Practicable Means at all stages of waste generation and management.

Minimise the generation of radioactive waste arising for disposal or storage by adherence to the 'waste hierarchy'



The Waste Hierarchy as implemented at GEHC

Intermediate Level Waste

Very few disposal routes for ILW

Waste is stored pending a national solution which will not be in place before 2050

Waste will need to be “Conditioned” prior to disposal to the National Repository

Intermediate Level Waste



Low Level Waste

LLWR Ltd Conditions for Acceptance (CFAs) are detailed and waste requires complex processing to demonstrate BPM and to meet CFAs and ensure best value for money

Frequent changes to CFAs require resource to review and modify waste processing

Documentation and process of waste transfer could be streamlined

LLWR is becoming more restrictive on acceptance of waste forms.

Low Level Waste



Interactions With LLWR Ltd

LLWR Ltd contract extended 6 months to March 09

LLWR Ltd propose new 5 year contract to give stability

BUT

- Proposal will include modified CFAs with waste segregation services
- Segregation services will divert waste from LLWR to recycle or other disposal routes
- Segregation services to be developed
- Delays in 5 year contract proposals creating uncertainty - costs
- Uncertainty of segregation services and future CFAs

The Future of LLWR

Cumbria County Council anticipate an 8 year life span in its planning permission for LLWR Vault 9

LLWR segregated proposals will extend the operational life of Vault 9

BUT

- By how much will this extend operation?
- What happens after Vault 9 is full?
- Waste to be placed in Vault 9 will be in “storage” rather than disposal?
- What happens if planning permission for disposal is refused?

Conclusions

Need for clarity on the future access to LLWR

Need for clarity near term longevity of LLWR

Require speedy resolution to new contract proposal and CFAs

Need certainty to plan the future of a fast moving, vital healthcare business.