

Decommissioning Working Group (DWG)

**NDA PhD Bursary scheme presentation
2017/18**

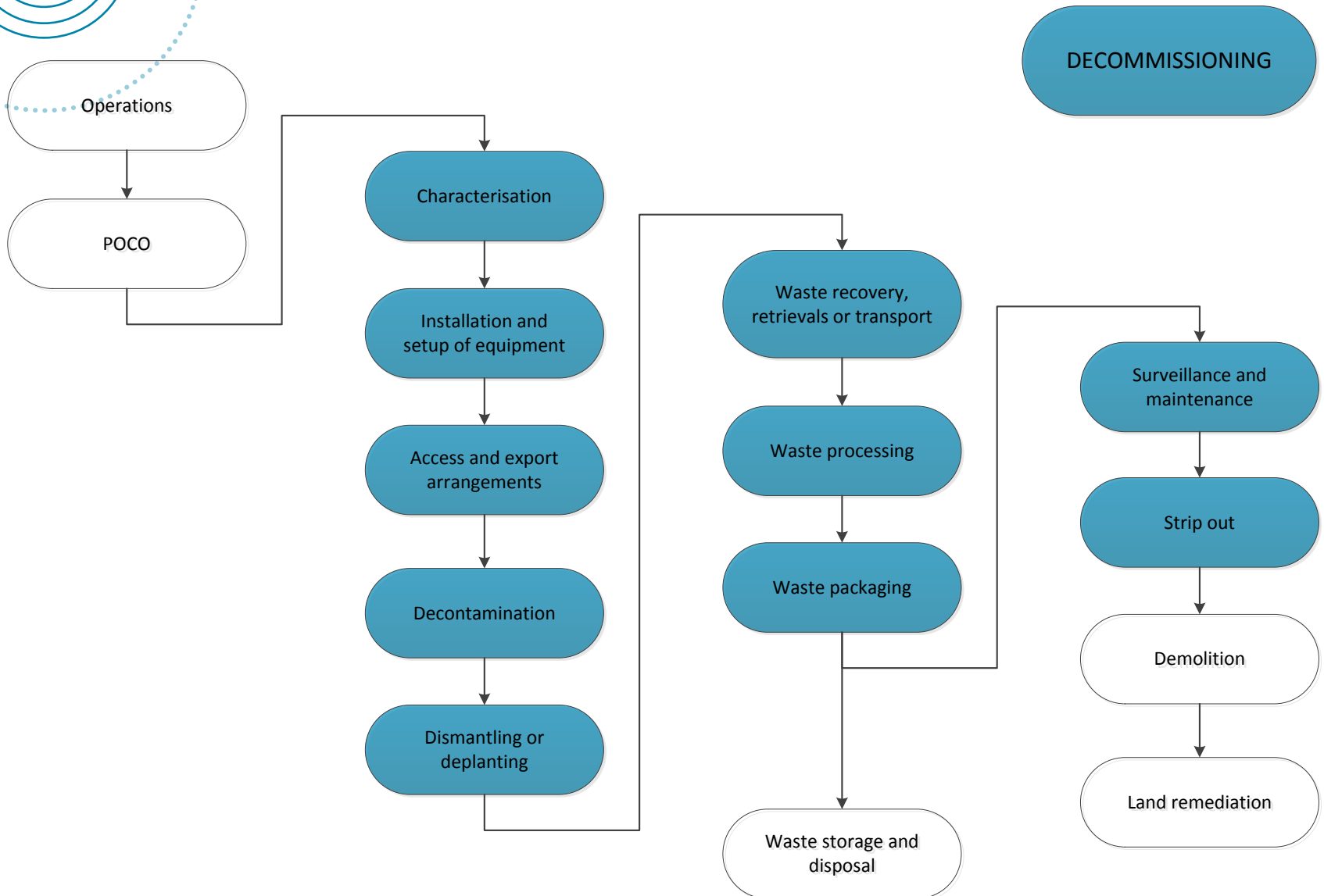




The DWG

- Promoting cross-SLC and inter-nuclear organisation sharing and learning of nuclear decommissioning technologies and experience
- Identifying strategic risks to the decommissioning mission and sharing learning from experience across nuclear organisations
- Identifying generic opportunities to commission research and development under the banner of decommissioning
- The DWG core group membership represented by NDA SLCs (Magnox, DSRL, LLWR, Sellafield Ltd), other nuclear operators (EDF, AWE), organisations (DEFRA, RWM) and NDA.

What is decommissioning?





DWG research themes

- Technologies and techniques for the recovery, characterisation and in-situ treatment of wastes
- Development of dry decontamination
- Decommissioning tools and techniques for manual or remote deployment
- Treatment or remediation of contaminated buildings
- Monitoring of decommissioned facilities

Decommissioning challenges

- Dealing with the unknown
 - Flexible processes
- Scale of task: large and small
 - Deployment and tools
- Facility geometry and complexity
 - Dexterity and precision
- Contamination and radiation
 - Containment and dose management
- Access
 - Manual, semi-remote or remote
- Decommissioning task
 - In-situ treatment, de-planting, cutting, recovery, segregation, monitoring



Recovery, characterisation and in-situ treatment of wastes

Successful decommissioning depends on slick, accurate and cost-effective waste management. Key challenges include:

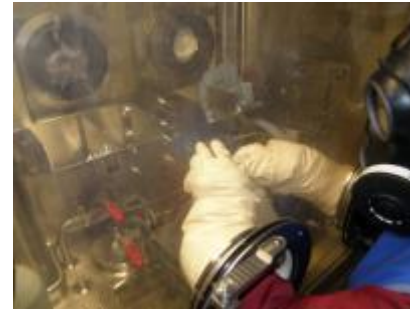
- Retrieval of waste from hazardous (high radiation, low accessibility) environments.
- Capability for in- or near-situ characterisation, sort and segregation, size reduction and treatment.
- Identification and management of heels and residues in pipework
- Accurate, quick systems for waste assay and classification, e.g. to reduce ILW to LLW
- Next generation control systems for continuous operations
- Systems that can make decisions and route waste from the “coal face”.



Dry decontamination

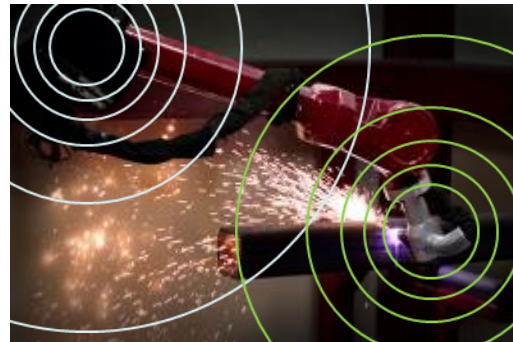
Decontamination is the mobilisation of a contaminating species from a substrate. Influencing factors include:

- *Purpose*: contamination control, dose reduction, waste re-categorisation, segregation
- *Type*: pipe blockage, solids, metallic, loose/fixed
- *Substrate*: steel, concrete, painted surfaces
- *Location and access*: within pipework, vessels, walls, gloveboxes, building structures
- *Mode of contamination*: deposits, absorbed material, chemically bound, ground in, activation
- *Scale of challenge*: height, large areas and volumes, complex geometry, small quantities of material



Tools for manual or remote deployment

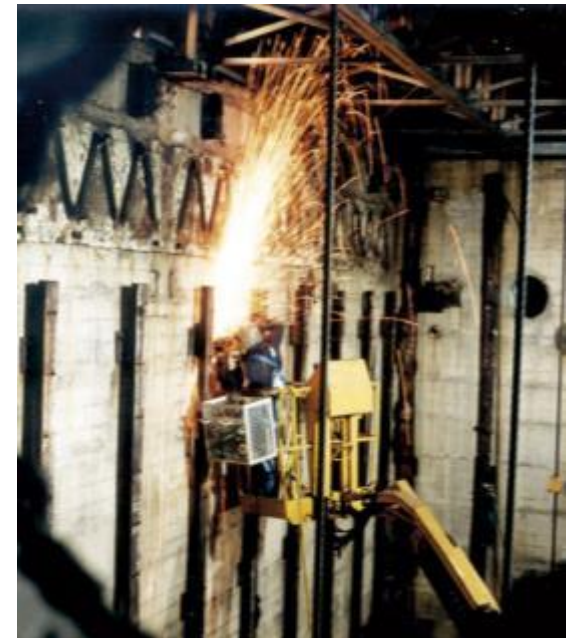
- Time at the workface can be limited in both manual and remote operations.
- Baseline uses direct control of dumb tools.
- Productivity and safety of operations can be improved with “intelligent” or semi-remote solutions:
 - Setup and walk away systems
 - Combined systems for characterisation, decommissioning and waste management
 - Real-time feedback
 - Autonomous control



Remediation of contaminated buildings

Key challenges in contaminated facilities include:

- Improving the safety and productivity of air-fed suit working
- Accurate assay and reclassification of Plutonium contaminated material as low level waste
- Contamination control during operations
- Optimisation of alpha measurement and decommissioning techniques to allow facility reuse



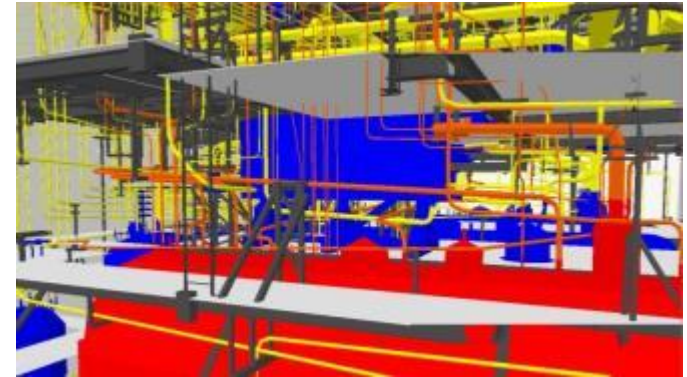
Monitoring decommissioned facilities

Deferred decommissioning allows decay of short lived radioisotopes, reducing the radiological hazard.

But, there are long (~100 year) periods of Care and Maintenance.

Improvements can be made with:

- Passive measurement systems
- Achieving “dark and dry” states where no inspection is required
- Containment monitoring
- Remote monitoring techniques
- Structural assessment capabilities
- Data management and trend analysis for 100+ year programmes





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How to find out more

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