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Swedish Radiation Safety Authority

Clearance and recycling – how can radiation protection and application of the waste hierarchy be optimised?

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Symposium on Recycling of Metals arising from Operation and Decommissioning of Nuclear Facilities, Studsvik, Nyköping, Sweden, April 8 – 10, 2014

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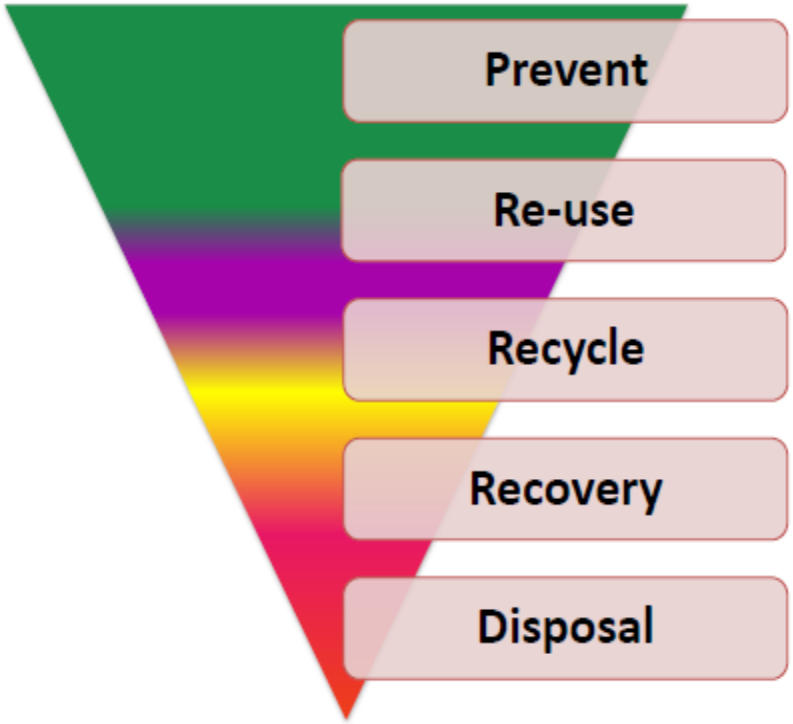
Introduction

- General requirements
  - Apply measures to avoid the production of radioactive waste
  - Manage and dispose radioactive waste in a safe way
  - Follow principles for radiation protection
- A range of approaches for different wastes
- Modern environmental legislation aims at sustainability, includes principles
  - Minimising impacts on the environment
  - Conserving natural resources

Swedish requirements on radioactive waste management

- Radioactive waste regulated by:
  - Act on Nuclear Activities
  - the Radiation Protection Act
  - the Environmental Code
- For all three:
  - Producer responsibility for waste management
  - SSM is the regulatory and/or supervisory authority for issues relating to ionising radiation
    - SSMFS 2008:1 (“*safety*”);
    - SSMFS 2008:37 (“”protection” & waste disposal)

The waste hierarchy



- Priority 1: Reducing the amount of waste produced
- Priority 2: Reuse of products
- Priority 3: Recycling of materials in the waste
- Priority 4: Recovering energy from waste (e.g. incineration)
- Priority 5. Disposal

Application to radioactive waste is **not** straightforward

Clearance of materials (1)

- Clearance means release from regulatory control; main condition for clearance is that expected radiation doses are sufficiently low
- Clearance of materials and waste also means releasing the licence holder from further responsibilities
- Optimisation of radiation protection remains valid even for materials that can be cleared (e.g. SSM advice on decontamination)

Clearance of materials (2)

- Clearance of material and waste with a low content of radioactive substances
  - Is fully consistent with radiation protection requirements
  - Offers possibilities for a rational and sustainable materials management according to the waste hierarachy
- Clearance has been a well-established part of the waste management system in Sweden for several decades.
  - Main examples: re-melting of metals, disposal of waste in a conventional disposal facility

Optimisation of waste management - radiation protection and sustainability

- Optimisation should play an integral role in radioactive waste management planning
- Identification and evaluation of alternatives at an early, pre-planning stage
- SSM:s view
  - difficult to achieve an "*ideal, fully optimised system*" taking all factors and potential scenarios into account
  - licence holders should investigate how radiation protection measures for workers may affect the amounts and activity content of materials for clearance

Factors to be considered in the context of clearance and recycling

- To be considered in the pre-planning stage:
  - Knowledge of the source of contamination and the history of contamination or activation of the material
  - Availability of adequate methods for clearance measurements
  - Possibilities of waste segregation and separation at the source of the waste stream
  - Possibilities of decontamination
  - Availability and acceptability of routes for recycling or disposal
  - Costs, environmental and material value

Summary and concluding remarks

- The generation of radioactive waste shall be minimised.
- Optimisation implies that there may be situations when it might not be reasonable to require any radiation protection measures.
- In any project there may be waste streams where clearance and subsequent reuse or recycling offer potential benefits.
- A number of factors should be considered by the licence holder at the pre-planning stage (possibilities for a common approach?).

Thank you!

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