A harmonized approach for establishing criteria for all radioactive wastes

Mikael Jensen, Anders Wiebert

Values of harmonization

Transparent societal goals

- Easy-to-understand systems
- Harmonized protection goals for public exposure

International references

- IAEA “DS354 SR: Disposal of Radioactive Wastes”
- ICRP 81 Radiation Protection Recommendations as Applied to the Disposal of Long-lived Solid Radioactive Waste
- BSS (EURATOM, IAEA) - exemption concept
* Observe that VLLW is not excluded!

Clearance and disposal at < 0.3 mSv/a

Concentration (Bq/kg)

1 A large number of scenarios are foreseen
2 Barriers or institutional control limit the number of scenarios

Clearance and disposal at < 0.3 mSv/a

Spent fuel

Concentration (Bq/kg)

1 A large number of scenarios are foreseen
2 Barriers or institutional control limit the number of scenarios
Possible need of coordination of regulation of streams vs. disposal sitesrepositories

Requirements on disposal sites

Objects for potential regulation

1 Waste streams

Nuclear waste

0.01 µSv/y?

2 Repositories - critical group ?/y

Regulatory components

- Principles
- Criteria
- Standards

Principles – criteria – standards

the municipal disposal site

Protection of individuals in the public

Principles – criteria – standards

Identification of limiting scenarios

Protection of individuals in the public
Harmonization

Harmonization
• does not imply that all types of rad. waste disposal are regulated by a single rule
• implies that due consideration has been given to a number of factors

Harmonization factors

Three types of harmonization factors

1 Societal factors
2 Practice-related factors
3 Property-related factors

Harmonization factors 1

1 Societal factors
• Resources are needed - implying policy/political decisions regarding
  – economy and responsibility
  – choices between alternatives practices creating waste
• Societal and economical factors will also influence the boundary conditions of the required optimization process or application of the BAT, principle
  – Example: optimize doses by choosing best site. Best in the country or best of available after governmental decisions?

Harmonization factors 2

2 Practice-related factors, related to whether
• the waste is a result of an on-going activity or not
• the waste comes from a regulated process or not
• the waste production is incompletely known or not
• a stream is temporary or continuous
• a waste stream can be lead into alternative waste disposal facilities

Harmonization factors 3

3 Property-related factors
• The properties of the wastes’ radioactive substances, e.g. radiotoxicity and half-life
• The total amount and concentration of radioactive substances in the waste
• Potential intrusion

Take the factors into account with some words on the way

• 10 microsievert/y. Normally no further need for supervision from the point of view of radioprotection
• 100 microsievert/y. Represents a burden on future societies, which constitutes a reason for regulation, but not necessarily an undue burden
• 1 mSv/y. Represents a dose that can be accepted in an exceptional situation of intrusion in a land-fill repository. (ICRP 81 span of 10-100 mSv should be reserved for repository with stronger barriers or institutional control)
Many remaining principles for discussion

1. Dilution / dilution-related issues
2. Averaging issues in compliance assessment
3. Limitation of available repositories (geological)
4. Information conservation – as optimization/BAT

Alum shale based concrete
2 kBq/kg

Construction material with restrictions