Disposal solutions implemented for ILW

Chul-Hyung Kang

Korea Radioactive Waste Agency

International Atomic Energy Agency Scientific Forum
RADIOACTIVE WASTE:
MEETING THE CHALLENGE
Science and Technology for
Safe and Sustainable Solutions
23–24 September 2014, Vienna, Austria

KORAD

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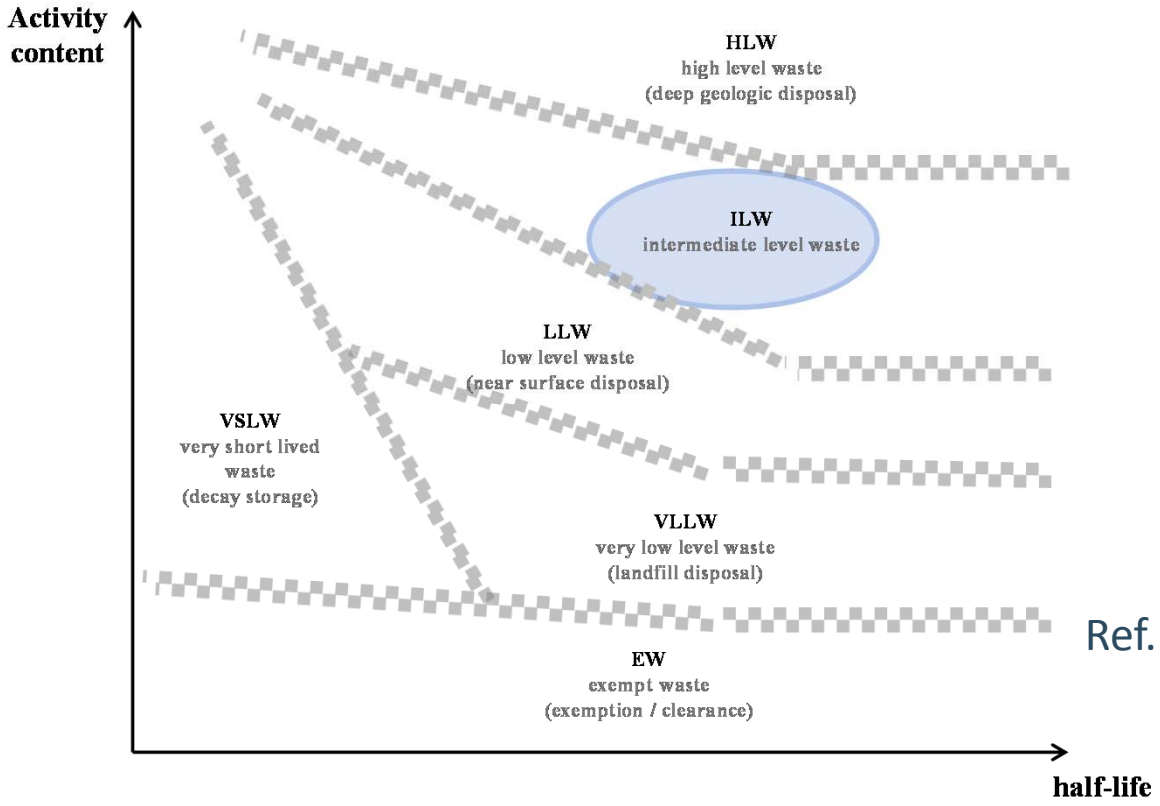
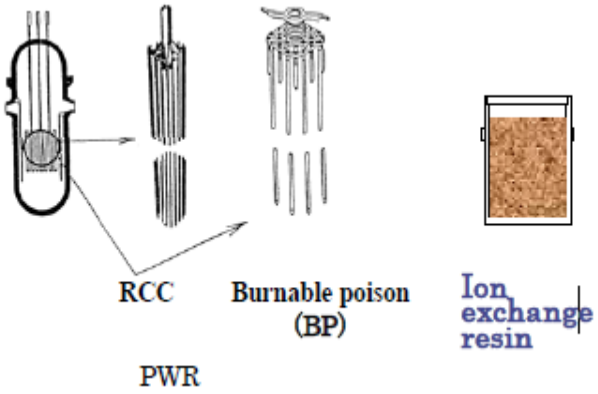
ILW - Definition

- Higher ϐ,ϒ radioactivity than LLW
- Long-lived radionuclides

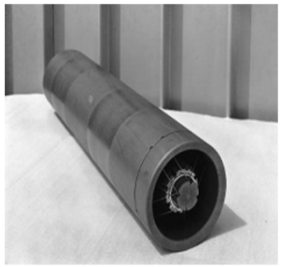


Ref. IAEA GSG-1,
Classification of RW (2009)

ILW – Generation



piles



Sleeves and cores

Am-Be neutron source

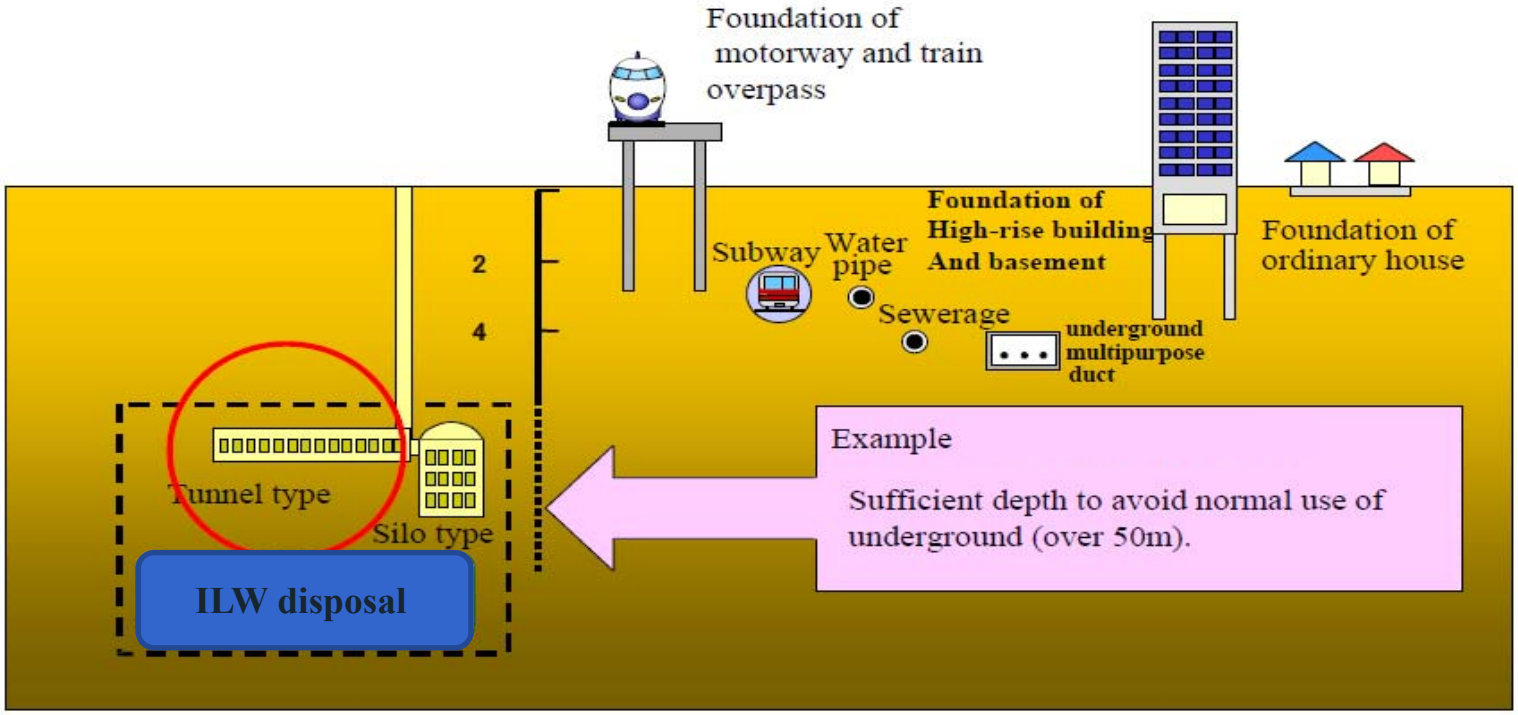
Activated metals
From nuclear reactors

Graphite waste

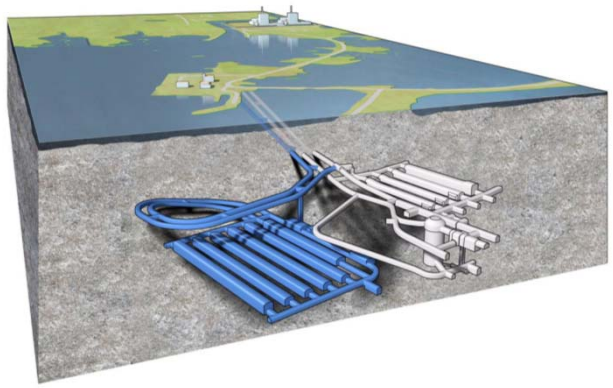
Disused sealed sources

ILW – Disposal Concept

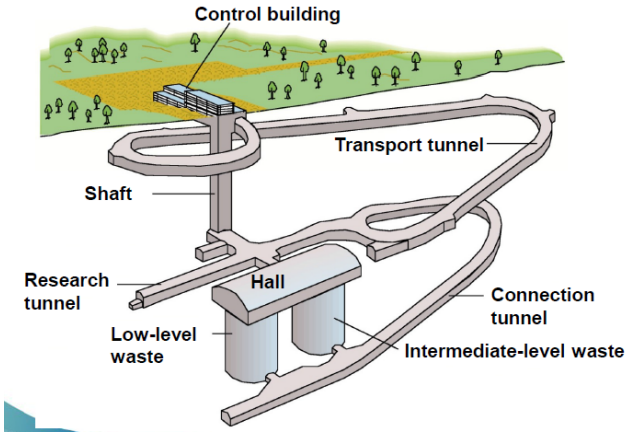
- Disposal of ILW : […] Disposal could be by emplacement in facilities constructed [...] at least a few tens of meters below ground level and up to a few hundred meters below ground level – IAEA SSR-5, Disposal of RW (2011)



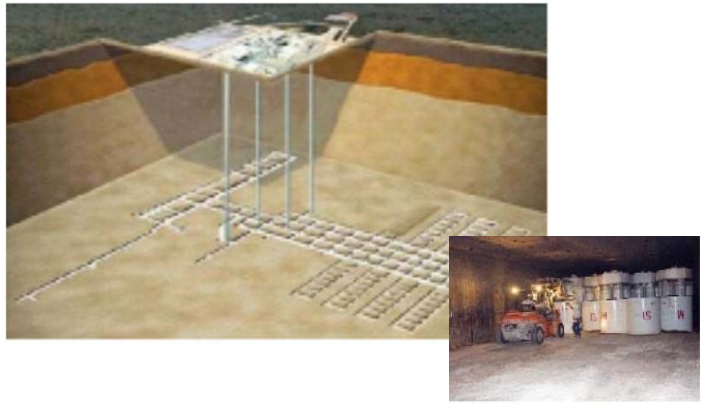
ILW – Current Practices (1)



Sweden - SFR



Finland - VLJ



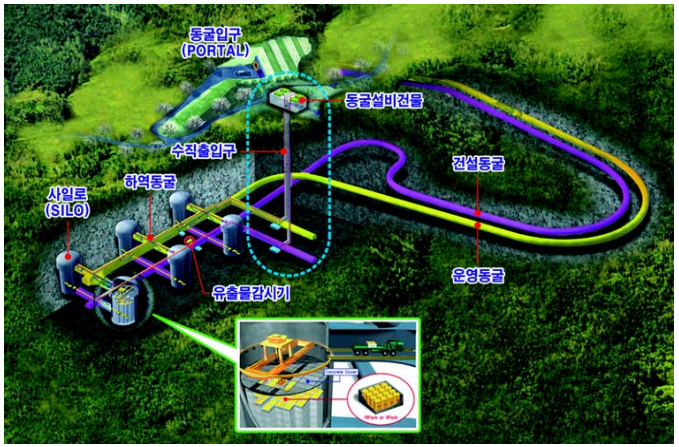
USA - WIPP

ILW – Current Practices (2)

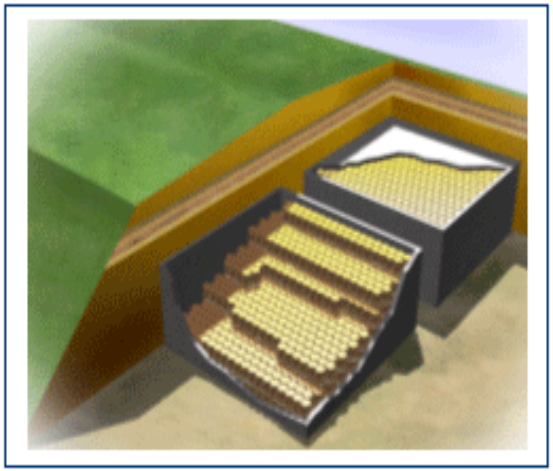
Korea – Wolsong LILW Disposal Center(WLDC)

ILW – Current Practices (2)

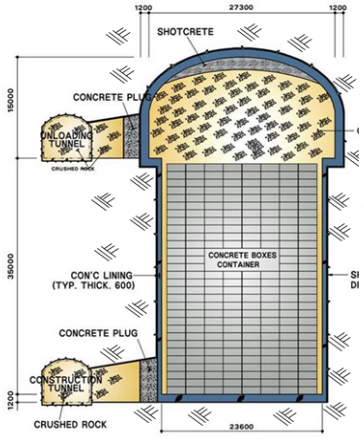
Korea – WLDC

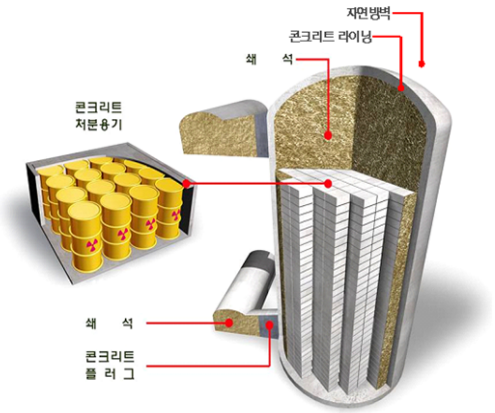


1st stage – underground silo

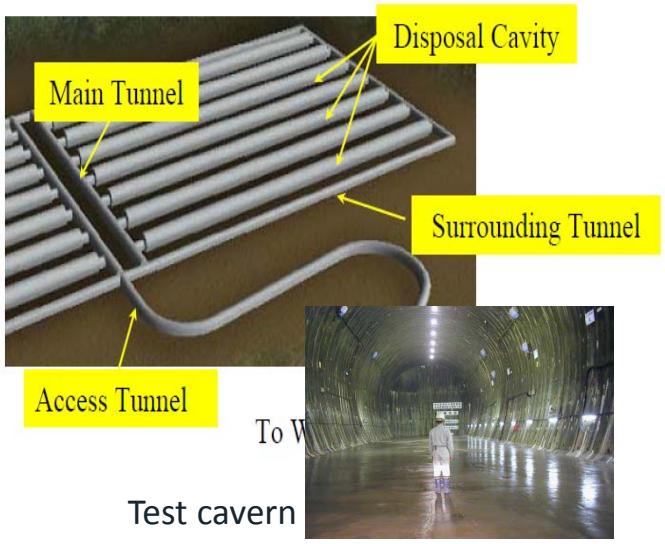


2nd stage – near surface

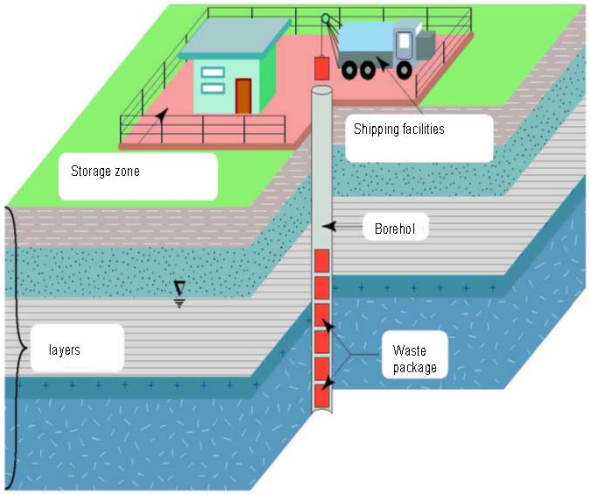




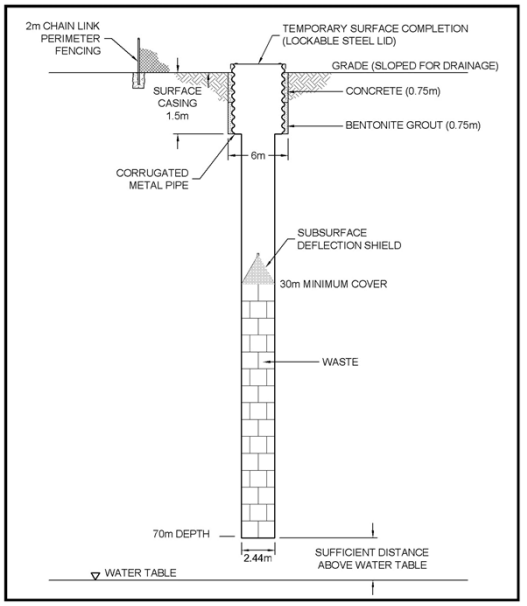
ILW – Disposal Alternatives (1)



JNFL – L1 Disposal Facility



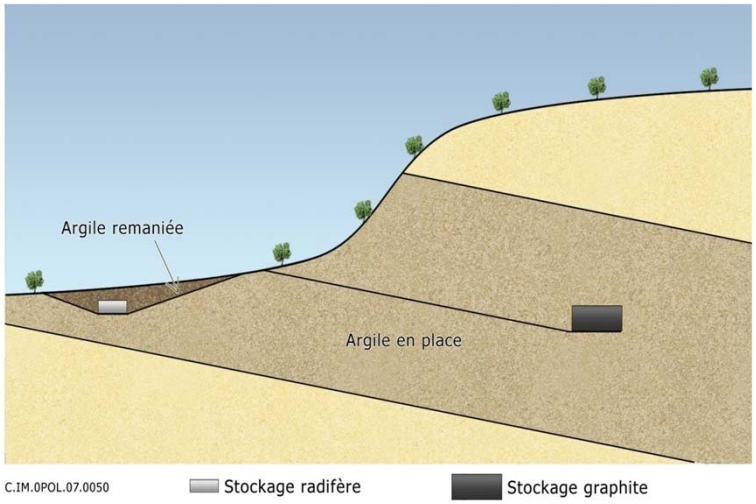
IAEA – BOSS
(BOrehole disposal of Sealed Sources)



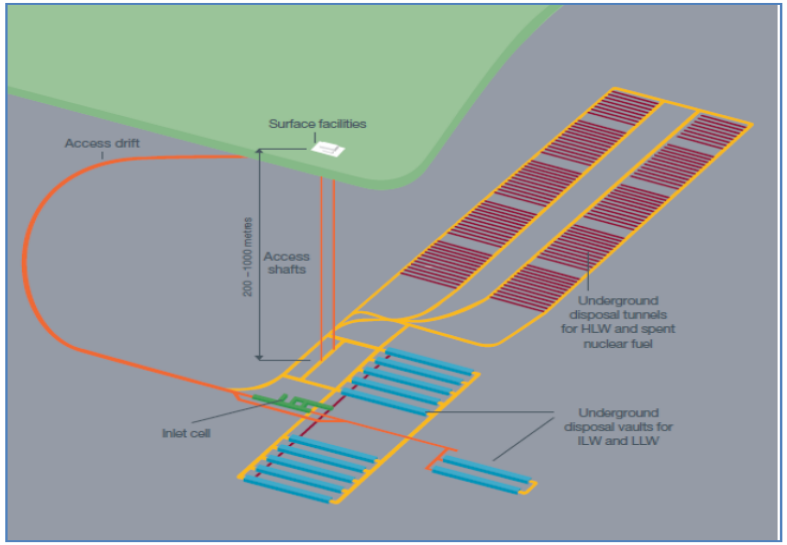
DOE – Borehole for GTCC

ILW – Disposal Alternatives (2)

- Co-disposal of ILW
  - With HLW in a deep geological repository
  - With LLW in intermediate depth geological repository



France(ANDRA) - ILW with LLW



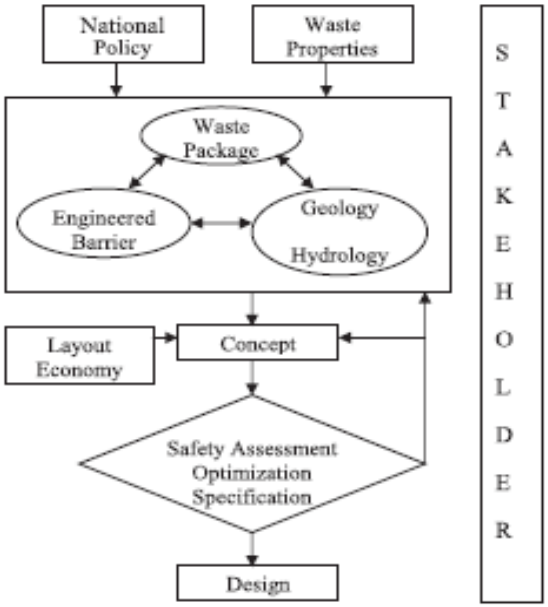
UK(RWMD) - ILW with HLW

ILW – Disposal Approaches (1)

- Key factors for selection of disposal concept
  - Protection of human health
  - Environmental protection
  - Availability of suitable geological environments
  - Availability of facilities and technologies
  - Economic and technical resources
  - Socio-political and ethical factors

ILW – Disposal Approaches (2)

- Decision making process for the development of a repository concept and design for ILW



Ref. IAEA Nuclear Energy Series NW-T-1.20, Disposal Approaches for Long Lived LILW (2009)

- The suitability of waste for disposal in a particular disposal facility is required to be demonstrated by the safety case and supporting safety assessment for the facility. - IAEA GSG-1, Classification of RW (2009)

Conclusions

- An important factor in the disposal of ILW is the concentration of long-lived radionuclides in the waste stream.
- There are currently several facilities in operation, and other disposal alternatives are being developed. Almost all of these are subsurface facilities with engineered barrier.
- All of the key factors(safety requirements, economic and technical resources, and socio-political and ethical factors, etc.) to develop a repository concept and design are likely to have a large impact on the choice of an option.
- The suitability of ILW for disposal in a specific disposal facility is required to be demonstrated by the safety case and supporting safety assessment for that facility.

Thank you for your attention !!