Decommissioning and decommissioning waste management

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Outline

- Practical experiences

- Overarching issues for decommissioning up for discussion
  - Immediate dismantling - implementation challenges
  - Holistic approach to decommissioning and waste management
  - Stakeholder involvement
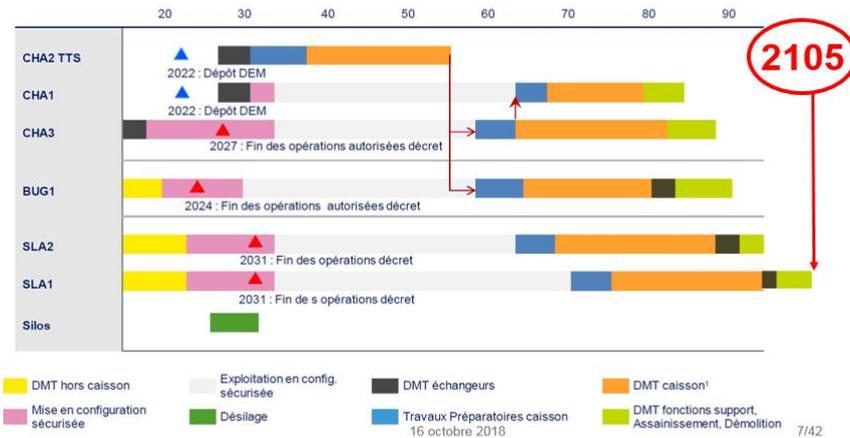 - Skills maintenance and "mindset for decommissioning"

Practical experiences

UNGG (gas-cooled) reactors concurrent dismantling

- 6 reactors permanently shut (1973–1994)
- R&D on decommissioning technologies
- Waste management route non available
- Need for a pilot

Saint-Laurent A

- **What does immediate dismantling mean?**
- **Maintenance of skills and operational knowledge over long time period**

Eurodif enrichment plant

- Permanently shut in 2012, emptying and rinsing operations (=> 95 % of residual uranium withdrawn)
- Waste management issues: VLLW (160 000 tons)
- Decommissioning duration: about 30 years
- End-state objective: to release buildings and lands from regulatory control, for industrial use

Gaseous diffusion barriers

- **Management of considerable amounts of very low-level waste**
- **Technology choices and social acceptance**

Chooz A, the first French PWR

- Commissioned in 1967, closed in 1991
- Reactor and auxiliaries in a cavern
- Step by step decommissioning
- Building feedback
  - steam generator withdrawal: 7 days -> 4 hours
- End of decommissioning expected by 2022

- **Anticipating decommissioning while designing the facility**
- **Benefiting from the decommissioning learning curve**

Overarching issues for decommissioning up for discussion

Immediate dismantling - implementation challenges

- Specified in international standards as preferred strategy
- Guiding principles : prevent undue burden, build on knowledge gained from the operating phase
- A single strategy, with case by case implementation, could be conditioned on the availability of specific facilities
- Immediate dismantling only for the very first steps (radioactive source term reduction)?

Irrespective of the prime responsibility of the operator, the regulatory body should drive a dynamic allowing dismantling to be started as soon as reasonably possible, and set milestones through legally binding provisions (requirements)

Holistic approach to decommissioning and waste management

- Start decommissioning, whatever the availability of disposal, and provide guidance for complementary facilities (storage)

- Secure funding based on a comprehensive view of the whole process, from decommissioning to disposal

- Review operators' strategy for decommissioning and waste management to deal with interdependencies and graded approach

The regulatory body should
- regularly establish a national plan covering all kinds of waste, including inputs from decommissioning strategies
- impel the development of safe waste management routes, based on complementary facilities if needed

Stakeholder involvement

- Long period for decommissioning procedures - specific milestones to be submitted to the public (end-state criteria, potential land use restrictions)

- In-depth discussions on waste management routes: schemes to be defined according to the sensitivity of the issues

- Public debate for the most sensitive issues related to social acceptance

The regulatory body should
- foster stakeholder involvement, routinely and for specific opportunities, in a timely manner
- provide civil society with educational material to enable effective participation in the debate

Skills maintenance and "mindset for decommissioning"

- Feedback and learning curve built on past decommissioning operations - technical as well as organisational

- Decommissioning requires and implies project management skills over long time periods

- Attractiveness, including for young generations (technical innovations, concern for the environment)

The regulatory body should support strengthening of skills for the benefit of safety, in cooperation with responsible government entities

Thank you for your attention