The Safety of Radioactive Waste and Spent Fuel Storage

Carl-Magnus Larsson

Australian Radiation Protection and Nuclear Safety Agency, ARPANSA

Australian Government

Australian Radiation Protection and Nuclear Safety Agency

International Atomic Energy Agency Scientific Forum

RADIOACTIVE WASTE: MEETING THE CHALLENGE

Science and Technology for Safe and Sustainable Solutions

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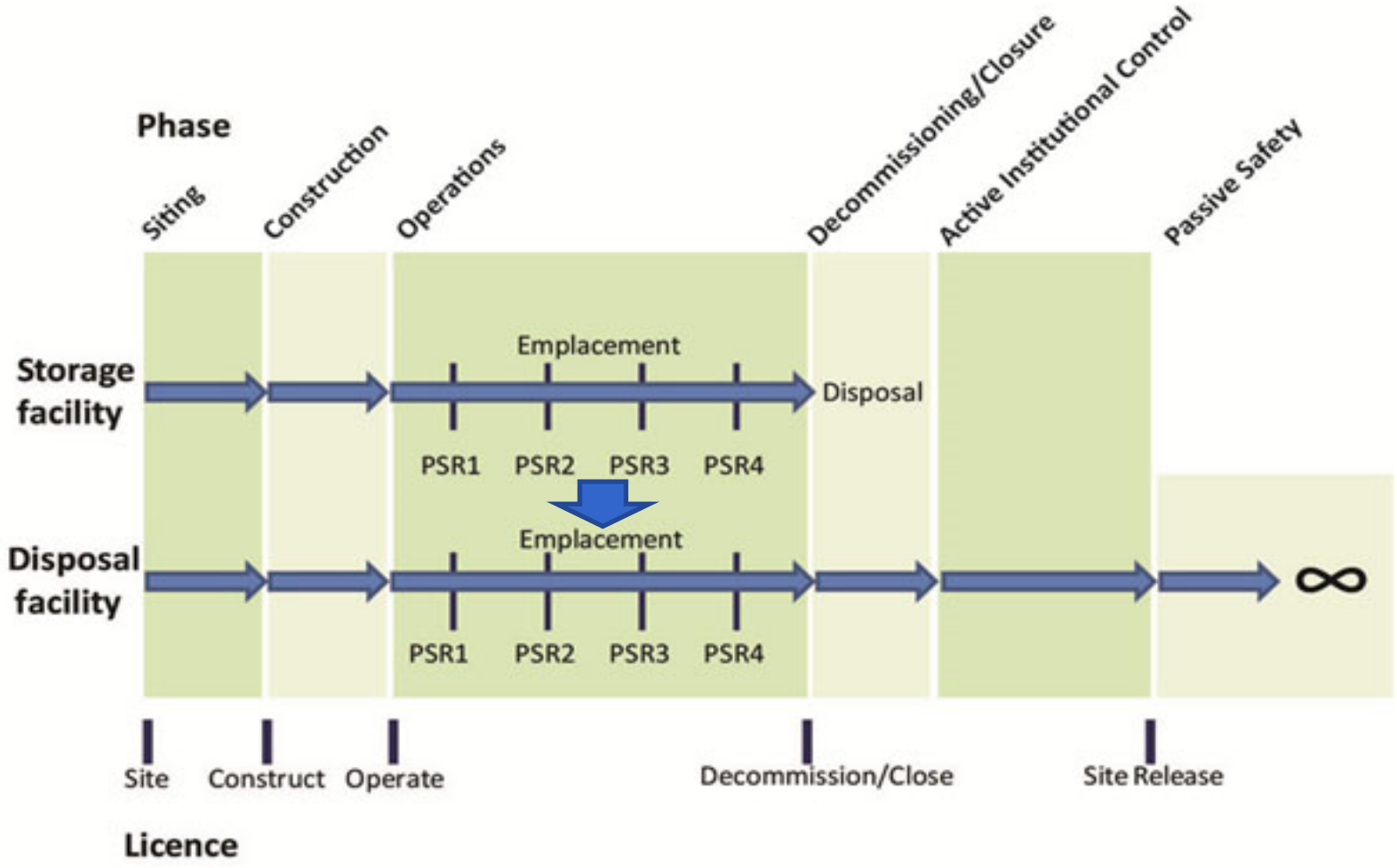
What is storage?

- Storage is **temporary** placement of radioactive waste/spent fuel in a facility; where it is isolated and monitored
- Storage is an **interim measure**
- **Scale** widely variable (designated and secure rooms to bespoke facilities – graded approach to safety appropriate

Life cycle, storage & disposal



Role of storage in the life cycle

RW/SF generation → **Storage** → **Final Management**

Industry Medicine Research Power gen.	Collection before/after other predisposal measures	Release (gaseous or liquid)
Accidents	Activity decay	Recycling/reuse
Other	Heat decay	Disposal

Storage of Radioactive Waste

- Normal practice
- Sometimes essential
- Cost effective
- Demonstrated safety
- But a **temporary** measure
  - Beyond reasonable times affects safety/security and drives costs

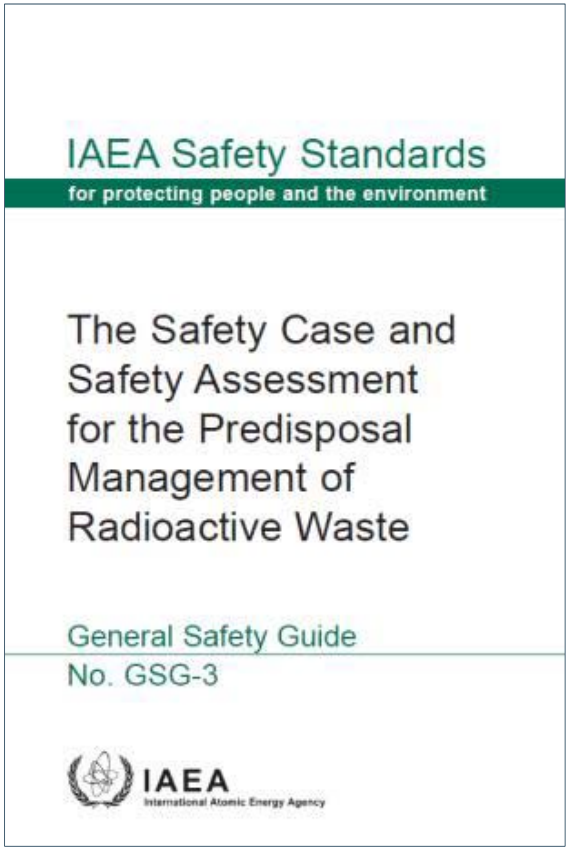
Storage of Spent Fuel

- Normal practice and essential
- Sometimes centralised
- But a **temporary** measure

Examples of SF storage, dry (left) wet (right)

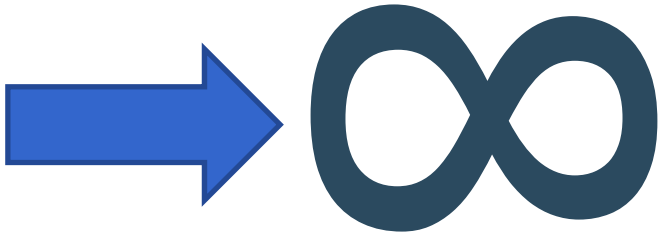
Basic principles apply

- Protection principles apply – ***planned*** *exposure*
- Safety principles apply
- Controls and responsibilities as for other facilities
- Over-all safety demonstrated in the **Safety Case**



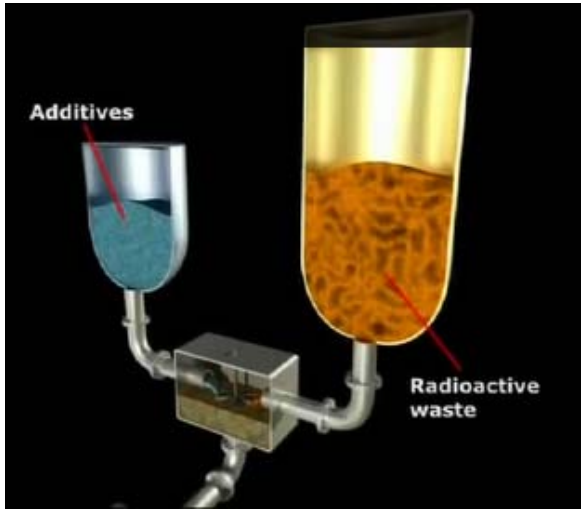
Looking ahead

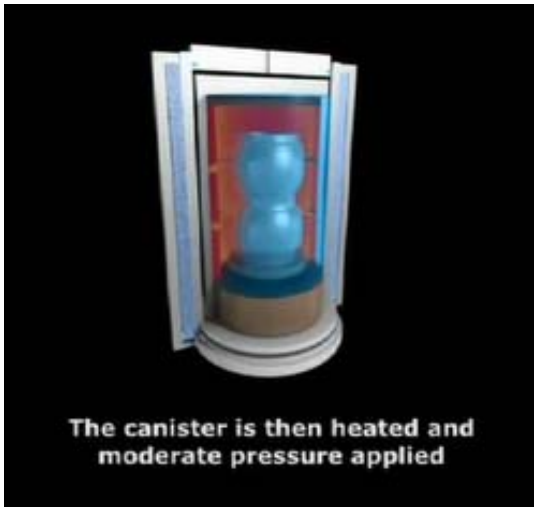
- Importantly, look ahead to ensure that all actions during predisposal management are focussed on safety of the waste in perpetuity following the ultimate solution.



Challenge: conditioning

- To be acceptable for disposal
- E.g. for liquid ILW/HLW





Example: ANSTO Synroc ® treatment of liquid ILW to immobilse the radionuclides in an inert matrix

Challenge: accidents

- From the 4th Review Meeting of JC, CPs requested to report on (at next meeting):

progress on lessons learned from the Fukushima accident in particular regarding strategies for spent fuel management

Waste storage, Date City 2014

Challenge: no disposal solution

- From the 4th Review Meeting of JC, CPs requested to report on (at next meeting):

safety implications of very long storage periods and delayed disposal of spent fuel and radioactive waste

The Road to the Disposal Solution

Conclusions

- Storage is standard procedure
- Demonstrated safety but scientific & technological challenges remain
- Reliant on timely establishment of final management option
- Absence of which extends storage and:
  - drives costs;
  - is detrimental to trust and confidence;
  - ultimately may become a safety concern;
  - all of ***which is avoidable***

The journey continues

Storage is ***a*** part of the journey, between its beginning and its end

Keeping the destination, final management and disposal, in sight is essential

And, bring the **Safety Case!**

Thank you

carl-magnus.larsson@arpansa.gov.au