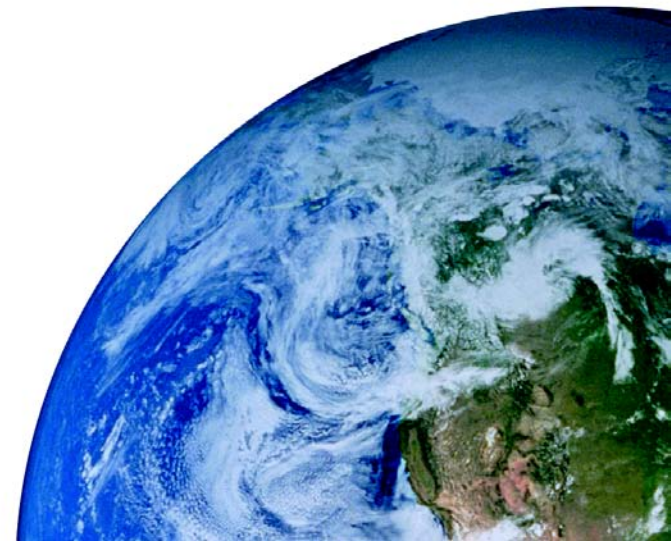


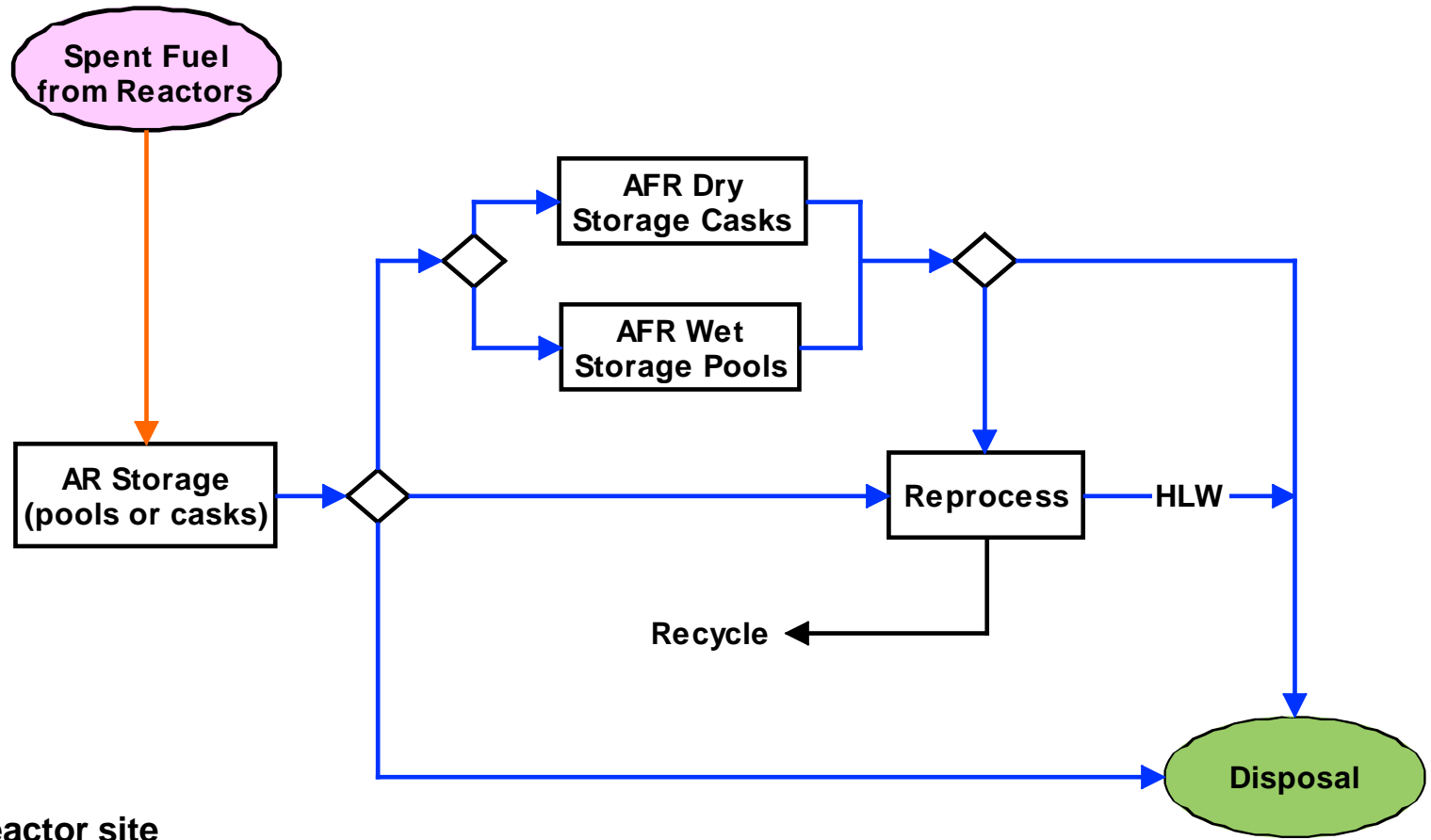
How to transport a cask which has been loaded and then stored for several decades

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Back-end of the fuel cycle



AR: At Reactor site

AFR: Away From Reactor site

Dual-purpose casks

- Several options for the back-end of the fuel cycle
 - Reprocessing
 - Interim storage in pool
 - Interim storage in storage casks
 - Interim storage in dual purpose casks



What is the issue?

- Transport
 - Package design approval issued for a limited period of time (typically 3 to 5 years) and to be periodically renewed
- Storage
 - Facility to be operated for several decades
 - Some authorities license the storage facility with the conditions that the package design is approved according to the IAEA Transport Regulations
- What is the issue?
 - “Maintenance” of the package design approval for transport
 - How to transport in several decades a package which is loaded today and for which there is a design approval issued today (based on current Regulations and practices / state of the art)?
 - What happens if after a certain period of time the approval cannot be renewed / prolonged?

- Five potential ways to solve the problem
- How to transport after several decades
- Conclusion

Way forward N° 1?

- To maintain the package design (transport) approval during the several-decade storage period
 - The package approval has to be periodically renewed / prolonged
- This is the basis of the German policy on this issue
 - Package design (transport) approvals for dual-purpose casks are issued with a validity period (5 years) longer than other “standard” approvals (3 years)
 - For dual-purpose casks which effectively are not transported, this validity period is extended to 10 years, and potentially - in the near future - to 20 years, with the conditions of periodic confirmation of compliance of the package design with the new Editions of the Regulations
- This approach is consistent with the transitional arrangements provisions in IAEA Regulations TS-R-1
 - No “end of life / use” date in the Regulations

Way forward N° 2? (1/2)

- To issue package design (transport) approval with a period of validity of several decades
 - This should allow to synchronize the end of validity of
 - the package design approval (transport)
 - the storage facility license
 - This could be done
 - in the framework of the current IAEA Transport Regulations or
 - after a revision of the IAEA Transport Regulations, in order to develop requirements for a new type of package (dual-purpose packages for transport and storage of spent fuel)

- This could be considered by many authorities as contrary to the general approach of the Transport Regulations (need for periodic review of the package design approval)

- To definitively stabilize the IAEA Transport Regulations and to stop the periodic review / revision of the IAEA Transport Regulations
 - This could be done at least for the dual purpose packages for transport and storage of spent fuel, after a revision of the IAEA Transport Regulations in order to develop requirements for a new type of package (dual-purpose packages for transport and storage of spent fuel)
- Is this contrary to the general approach implemented by the Agency to periodically review the Regulations?

- To revise the IAEA Transport Regulations in order to extend the transitional arrangements which exist for packages not requiring competent authority approval of design (para. 815 of the 2009 Edition of TS-R-1) to all types of packages, or at least to the dual purpose casks.
 - ... *packages prepared for transport not later than DATE under the YEAR editions of the Regulations may continue in transport ...*
- WNTI made an “extrapolated” proposal in the framework of the review / revision cycle which started in 2009. This proposal was not received positively by the competent authorities, though the need to address the issue was recognized

Way forward N° 5?

- To avoid to link the storage license and the package design approvals, and at least to avoid requiring maintenance of the package design (transport) approval along the all life of the storage facility
 - Swiss competent authorities require that the package design is approved (only) when loading the cask
- This alleviates the problem of the “maintenance” of the package design approval for transport during the storage period
 - This does not allow to transport after several decades

How to transport after several decades? (1/3)

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- To implement an inspection, testing and maintenance programme to give assurance about the physical condition of the casks and to give confidence about the general safety of the packages which are stored.

How to transport after several decades? (2/3)

- To renew / prolong the package design (transport) approval during the whole storage period

or

- If needed, to transport the cask, either:
 - through an updating of the safety assessment demonstrating the compliance of the package design with the Regulations applicable at the time of transport,

or

- with minor modifications of the cask if needed and sufficient, and subsequent updating of the safety assessment demonstrating the compliance of the package design with the Regulations applicable at the time of transport,

or

- through the special arrangement procedure (as a package design (transport) approval was granted at the beginning of the storage period, the transport can probably be performed with the appropriate level of safety when implementing appropriate reasonable additional provisions)

How to transport after several decades? (3/3)

- Alternative approach
 - To store the fuel in a sealed storage canister and a concrete module or a metallic overpack
 - When necessary, to transport the sealed canister (including the fuel) in a transport packaging, complying with the applicable transport Regulations

CONCLUSION

- Issues
 - Administrative
 - But also technical : ageing of the package
 - cask + radioactive contents
- Increasing notice
 - “Spent fuel storage and transportation licensing conference and workshop” (US NRC / June 2010)
 - International conference on management of spent fuel from nuclear power reactors (IAEA / June 2010)
 - “International Project on Safety Assessment Driven Radioactive Waste Management Solutions (SADRWMS)” (IAEA)
 - “TRANsport Safety Standards Committee (TRANSSC)” (IAEA)
- WNTI to be a significant voice on this issue and to bring its contribution and expertise