



Towards a Joint Programming on Radioactive Waste Disposal

Overview of activities in radioactive waste management and the role of Joint Programming



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Radioactive Waste Management

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Objective of RWM

- To protect the environment from harmful impacts of radioactive (and toxic) materials contained in waste
- Basic method: concentrate and contain
- Achieved through:
 - ✓ the set of **OPERATIONS**
 - ✓ performed using adequate **TECHNOLOGIES**
 - ✓ in suitable **FACILITIES**



RWM lifecycle elements & technologies & facilities

- **Collection:** characterization, sorting, storage
(tanks/vaults, apparatuses, **buildings/facilities**)
- **Treatment:** volume reduction, chemical alteration
(apparatuses, handling/transport, **buildings/facilities**)
- **Conditioning:** immobilization, packaging
(apparatuses, handling/transport, **buildings/facilities**)
- **Storage:** temporary placement of waste
(handling/transport, **buildings/facilities**)
- **Disposal:** eventual placement (**buildings/facilities**)



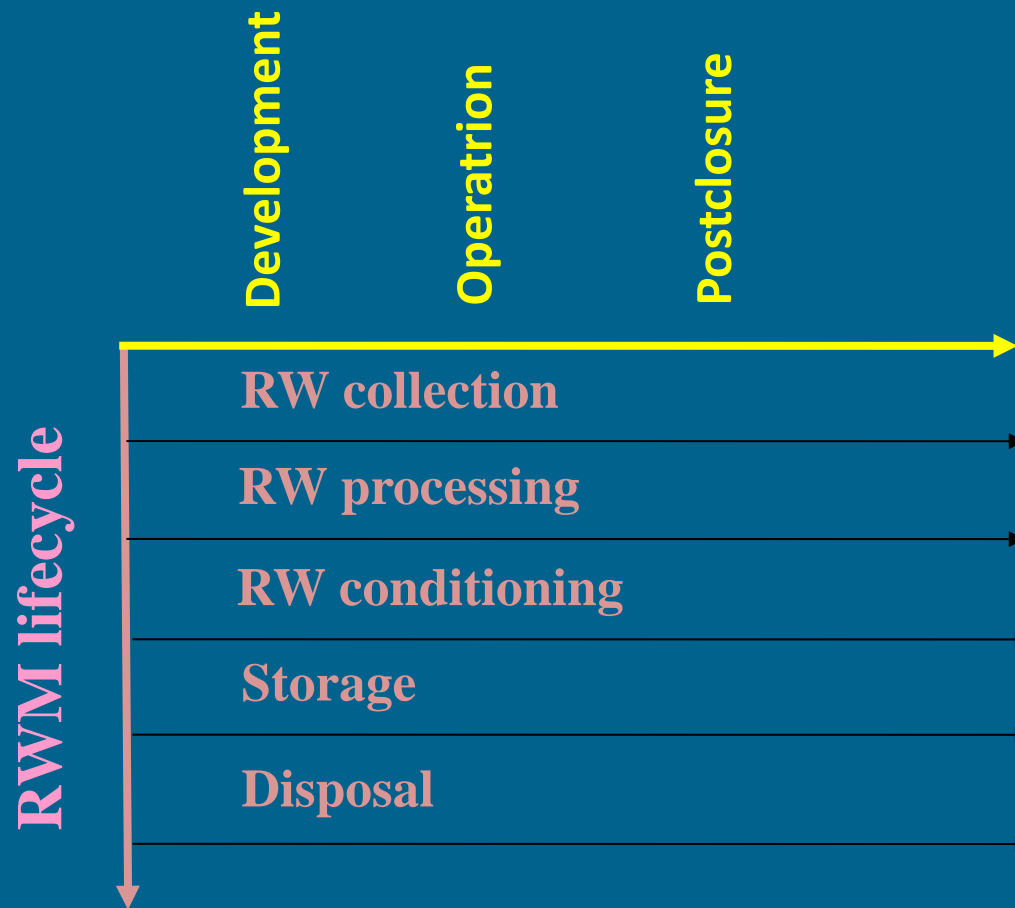
Waste facility lifecycle

- **Development:**
 - ✓ conceptual planning
 - ✓ design
 - ✓ siting
 - ✓ safety case
 - ✓ construction
- **Operational period:**
 - ✓ the use of the facility
 - ✓ its closure
 - ✓ safety case
- **Post-closure period:**
 - ✓ decommissioning
 - ✓ institutional control
 - ✓ safety case



Waste management vs. facility lifecycles

Facility lifecycle



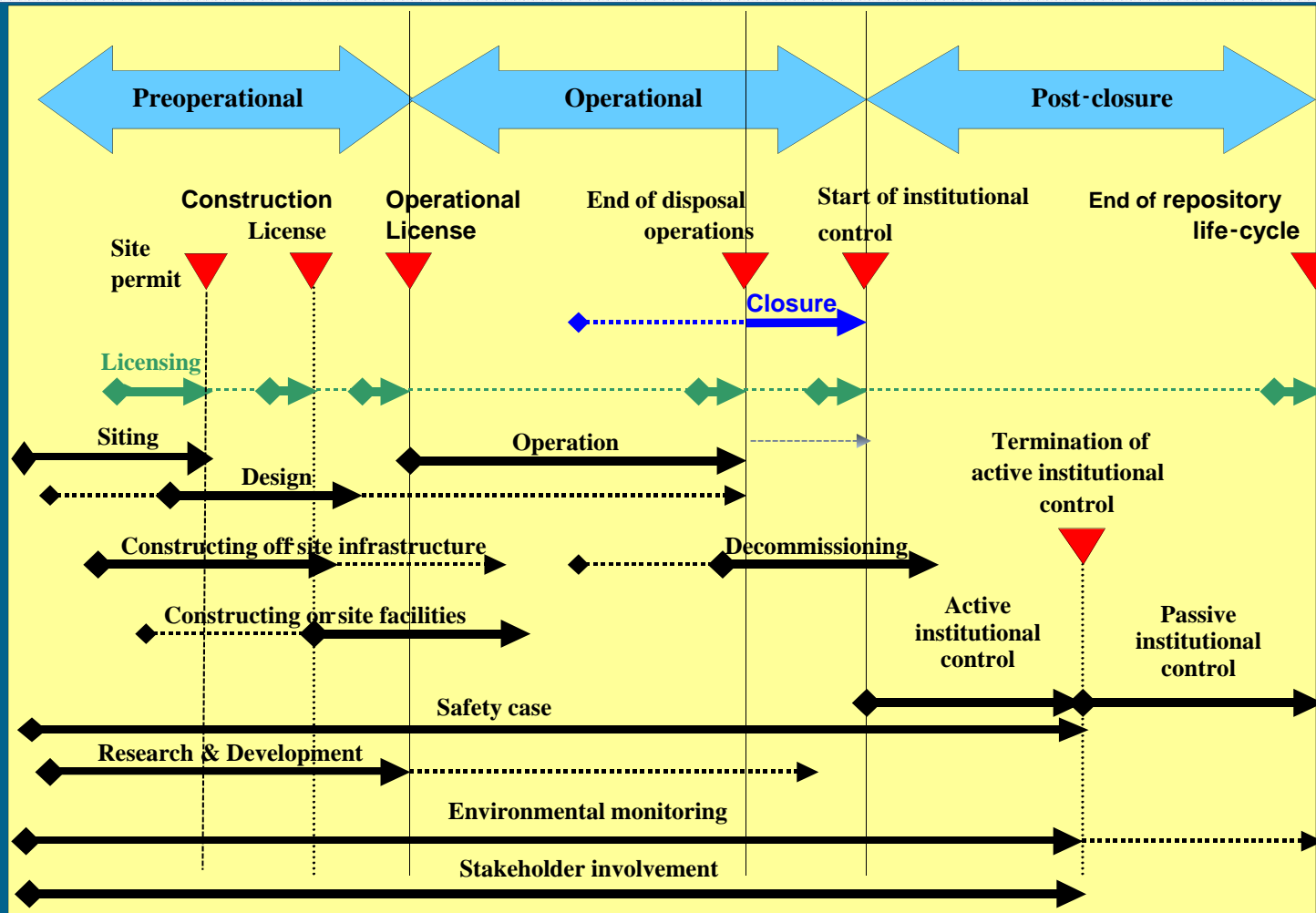


Waste management vs. facility lifecycles

RWM lifecycle phases	RWM facility lifecycle steps							
	Project management	Siting	Design	Safety assessment	Construction & acquisition	Operation & closure	Decom & env. remediation	institutional control
Collection	x		x	x	x	x	x	
Characterization	x		x	x	x	x	x	
Storage of raw waste	x		x	x	x	x	x	
Treatment	x	x	x	x	x	x	x	
Conditioning	x	x	x	x	x	x	x	
Storage of conditioned waste	x	x	x	x	x	x	x	
Waste handling/transport	x			x	x	x		
Disposal	x	x	x	x	x	x	x	x

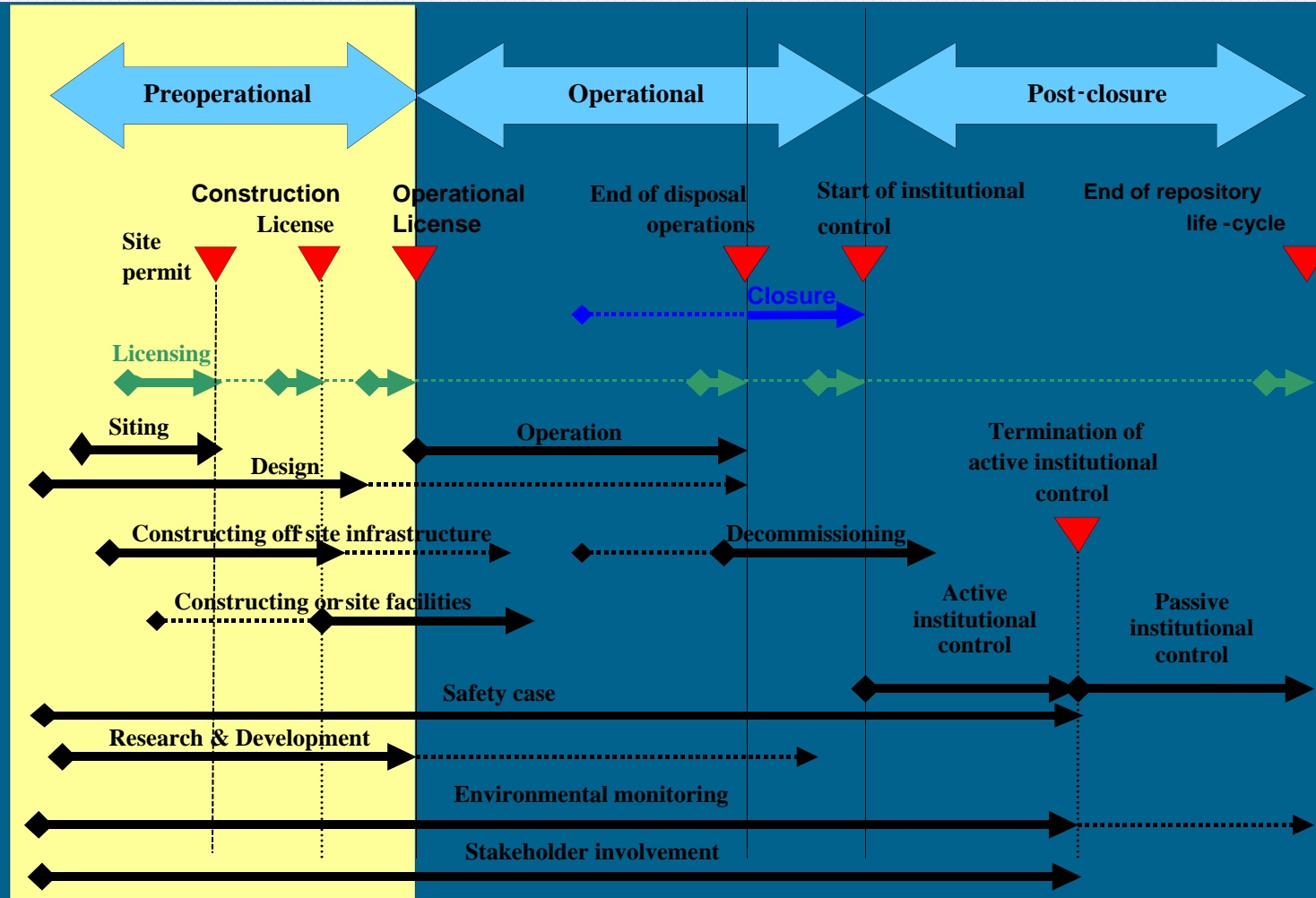


Repository lifecycle (TECDOC 1552)





Area of Joint Programming





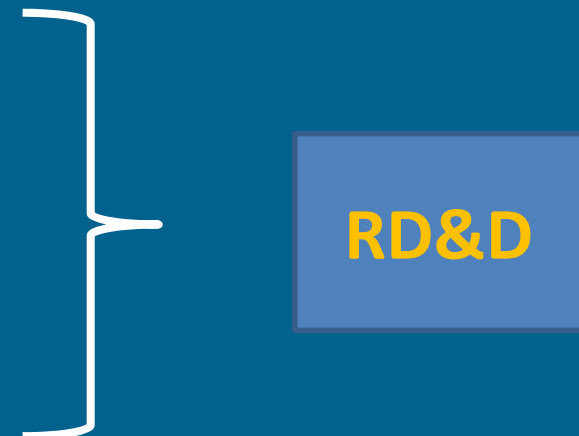
Sequencing activities

➤ Serial activities

- ✓ Licensing (licensing steps – might be indicated as milestones)
- ✓ Planning (between milestones and for the whole project)

➤ Parallel activities (between milestones)

- ✓ Geological investigations
- ✓ Design
- ✓ Safety assessment
- ✓ Monitoring
- ✓ Stakeholder involvement





Parallel and serial activities

	Design	Siting	Safety case	Licensing
M 1	Conceptual plan completed			
	Design goals	Existing information	Conceptual SA	
M 2	Sites screened			
	Conceptual design	On-site geol. investigations	Initial SA	Parallel studies
M 3	Candidate site selected			
	Basic eng. design	Confirmation URL	EIA	Parallel studies
M 4	Site confirmed			Site permit
	Detailed eng. design		Preliminary SA	
M 5		Start of construction		Construction license



RD&D priorities 1

	Design	Siting	Safety case	Licensing
M 1	Conceptual planning completed			
	Design goals	Existing information	Conceptual SA	
M 2	Sites screened			

- Mostly routine investigations (geology, environment, conflicts of interest)
- Mobilisation of RD&D capacities and capabilities
- International assistance in strategic matters, conceptual planning, tutoring/training



RD&D priorities 2

	Design	Siting	Safety case	Licensing
M 1	Conceptual planning completed			
	Design goals	Existing information	Conceptual SA	
M 2	Sites screened			
	Conceptual design	On-site geol. investigations	Initial SA	Parallel studies
M 3	Candidate site selected			

- Intensive routine investigations
- Extensive RD&D – basic research, PA/SA, understanding long term behaviour of the system
- Broad international efforts (contracts, cooperative projects)



RD&D priorities 3

	Design	Siting	Safety case	Licensing
M 1	Conceptual plan completed			
	Design goals	Existing information	Conceptual SA	
M 2	Sites screened			
	Conceptual design	On-site geol. investigations	Initial SA	Parallel studies
M 3	Candidate site selected			
	Basic eng. design	Confirmation URL	EIA	Parallel studies
M 4	Site confirmed			Site permit

- Routine investigations, confirmation URL
- Extensive RD&D – safety assessment, demonstration of the system suitability, environmental impact
- Broad international efforts (cooperative projects)



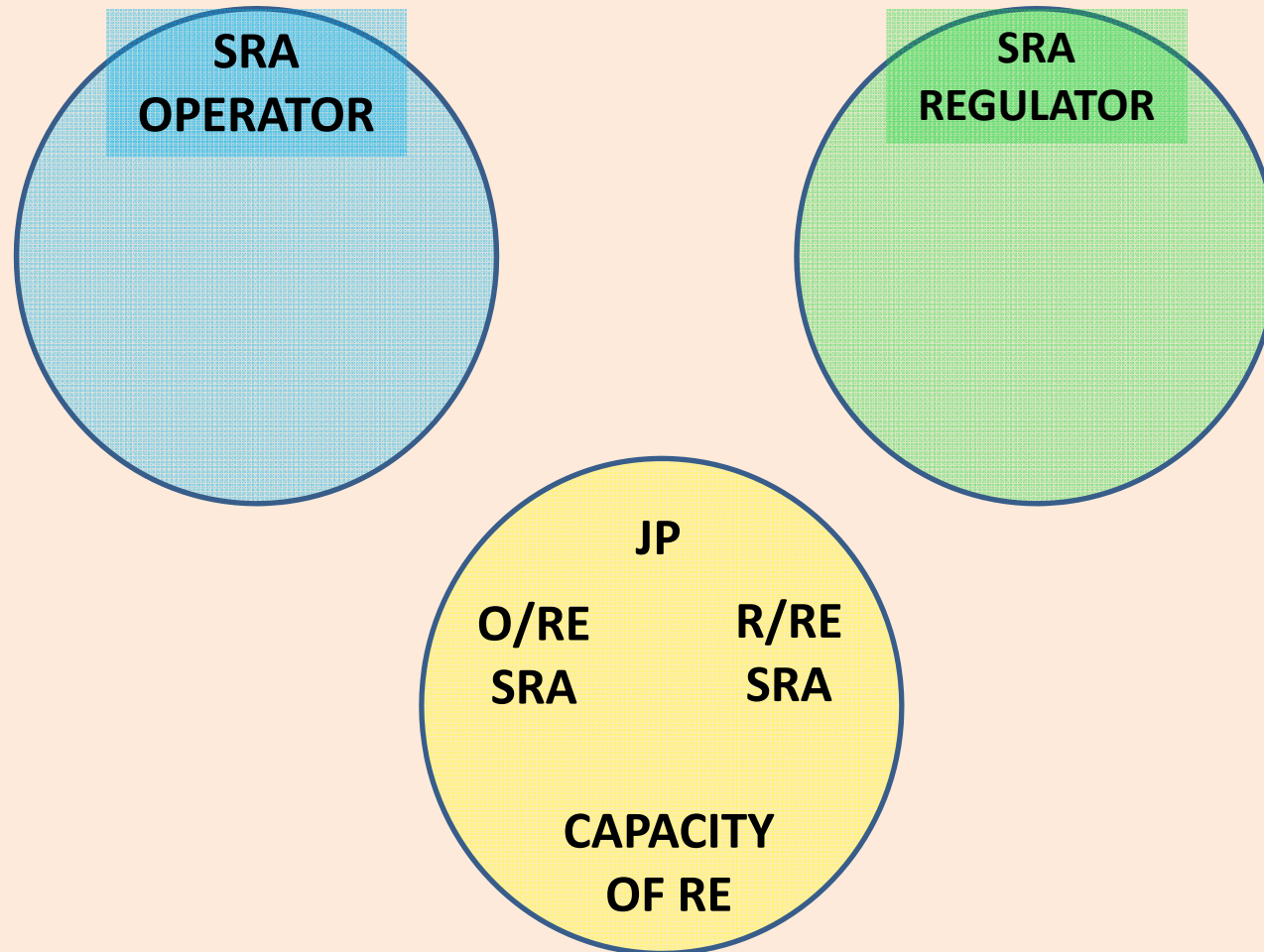
RD&D priorities 4

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M 1	Conceptual planning completed			
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M 3	Candidate site selected			
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M 5		Start of construction		Construction license

- Demonstration of technologies
- Prevailing technological RD&D
- International efforts (contracts, cooperative projects)



Joint RD&D interest (SRA)





Summary

- **Disposal facility lifecycle is a part of RWM lifecycle**
- **Without proper planning of RWM lifecycle it is difficult to initiate and perform particular facility lifecycles**
- **RD&D needs and goals are evolving during the facility lifecycle**
- **International cooperation preferences follow this evolvment**
- **Joint programming is supposed to support and optimize coordinated international efforts by addressing needs of operators, regulators and involved research entities**



Thank you for your attention