EU-H2020- SHARE-Decommissioning
On-line Workshop, December 1-3, 2020

Group D
Session 5: Site Preparatory Activities

Session will start at 9:00 CET

Muhammad Junaid Chaudhry- KIT

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement nº 847626.

Group D
Session 5 : Site preparatory activities

Agenda

Dec 3d	**International initiatives**		
	9:00	5A	Presentation of IAEA report on preparation of decommissioning by Patrick O'Sullivan *(10min)*
	9:10	5B	Presentation of NEA Report "Preparing for Decommissioning During Operation and After Final Shutdown" (TGPFD) By Boris Brendebach, German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety *(10min)*
	9:20	5C	Presentation of first achievements from SHARE in this area + introduction to post it session, by Junaid Chaudhry *(10 min)*
	9:40 - 12-00 Post it session by sub- thematic area		
	Link MURAL 49	49	Systems for internal decontamination
	Link MURAL 48	48	Preparation of infrastructures and buildings for decommissioning (storages, capabilities for material sorting and treatment...)
	Link MURAL 47	47	Adaption of auxiliary systems for decommissioning (ventilation, electrical, monitoring, etc.)
	12:00- 13-00 Lunch Break		
Dec. 3d	**13:00 - 16:00: Plenary session (see general program)**		

IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Preparation for Decommissioning

Patrick O'Sullivan

International Atomic Energy Agency

3 December 2020

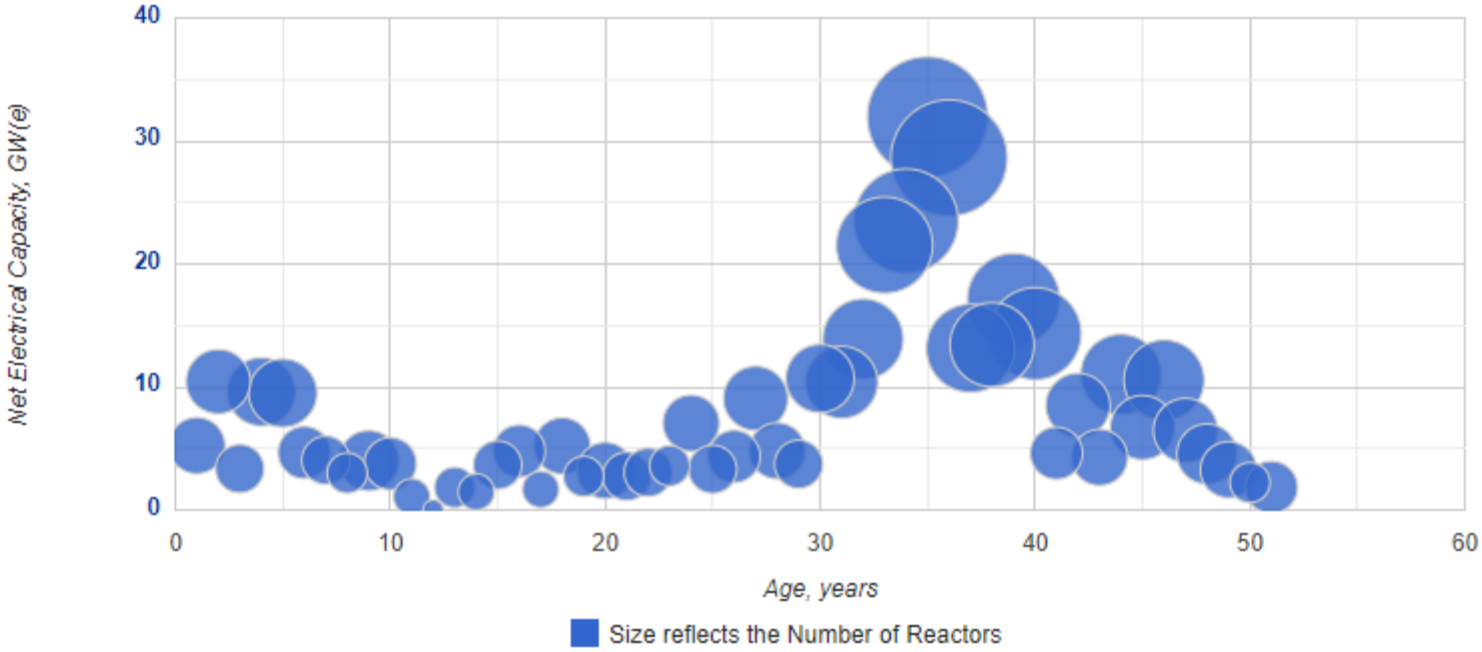
Horizon 2020 SHARE-Decommissioning Workshop
1-3 December 2020 *[Virtual]*

Preparation for Decommissioning

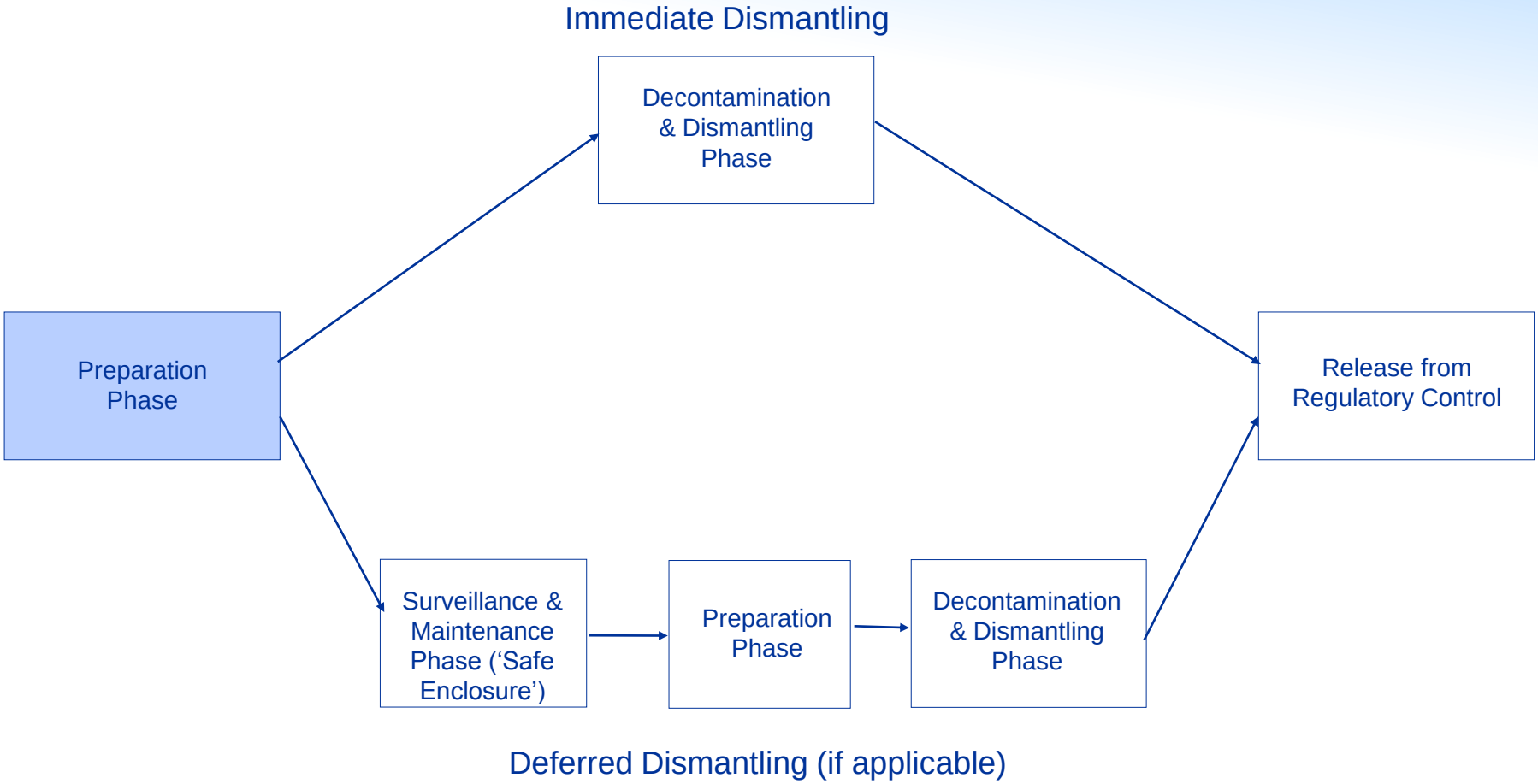
Plan of Presentation

- Main Phases of Decommissioning
- Preparatory Activities for Decommissioning
- Contracting Strategies
- Conclusions

Nuclear Power Plants Currently in Operation



Main Phases of Decommissioning

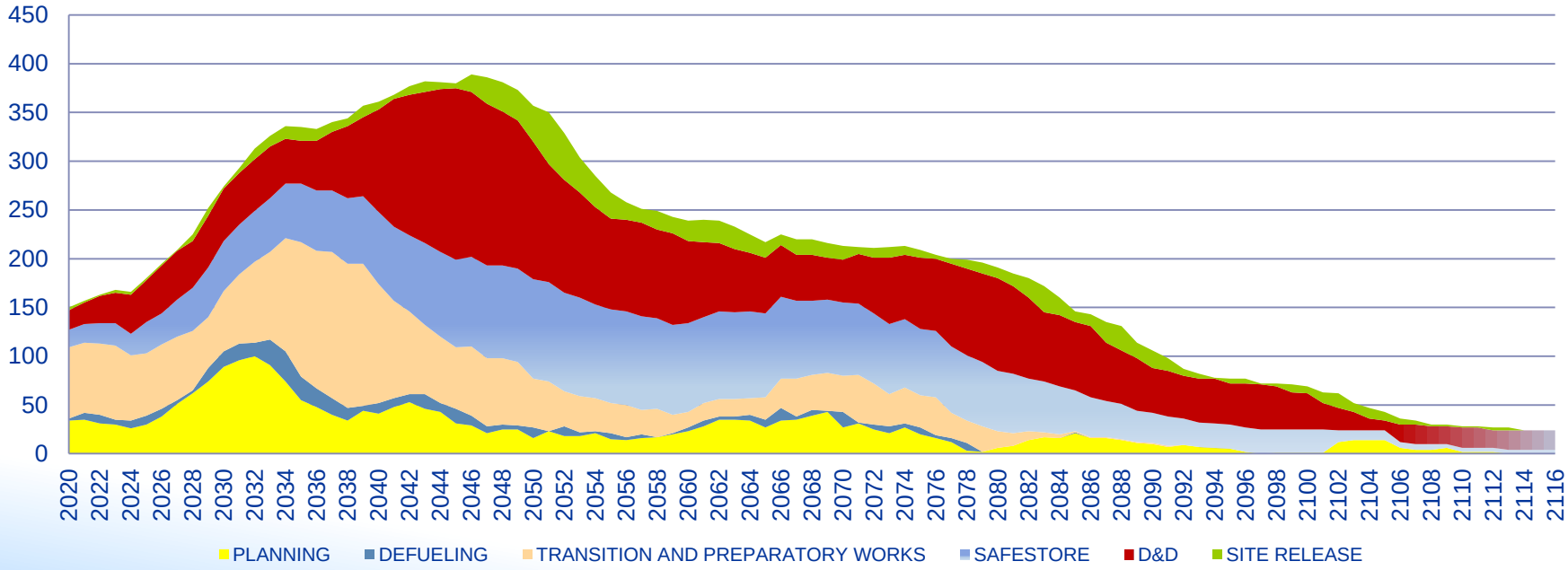


Future NPP Decommissioning Scenario

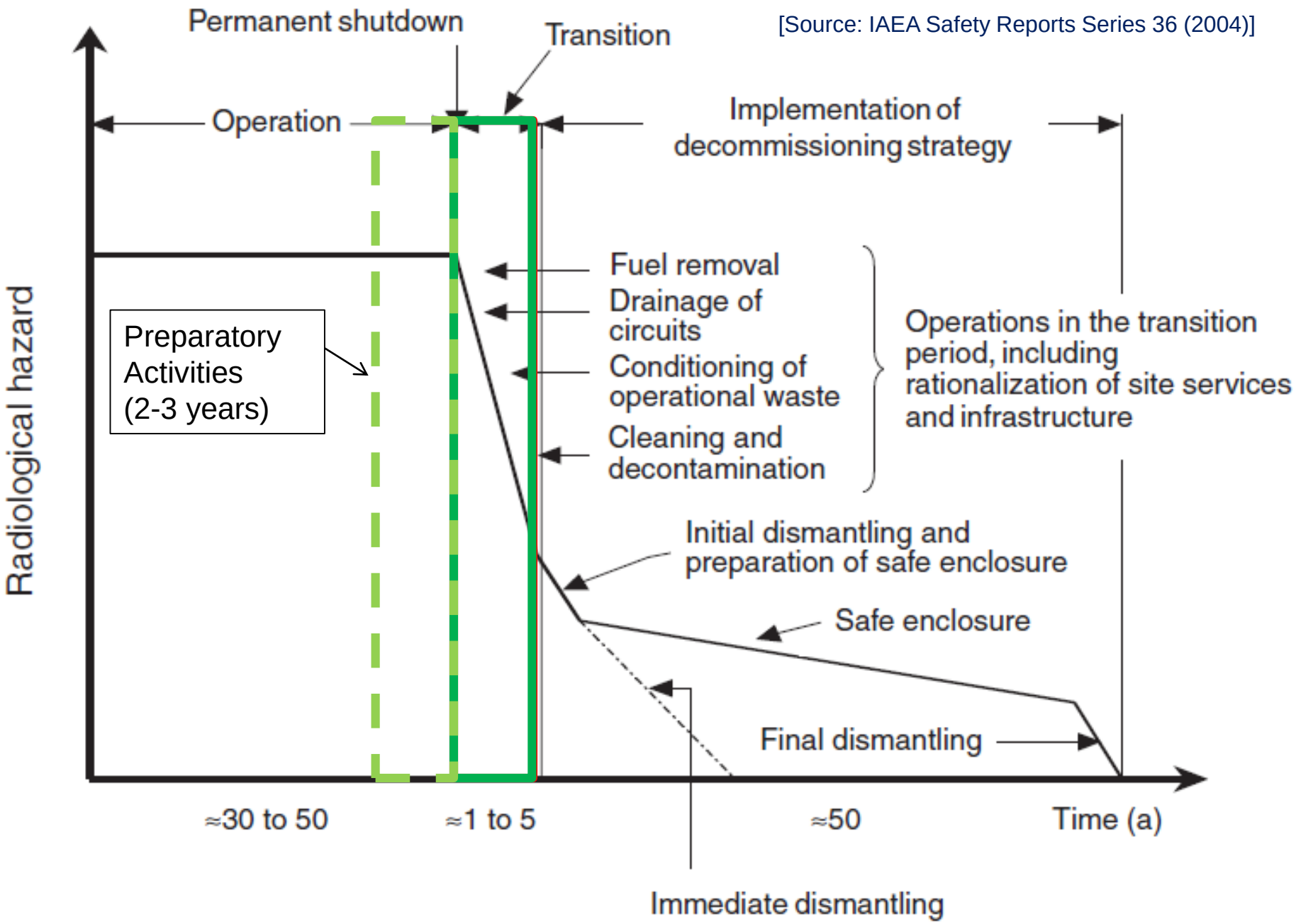
Hypothesis of this illustrative simulation

- *Shutdown after 50 years assumed unless actual timeframes are known*
- *Immediate or deferred dismantling strategy applied when known*
- *Immediate dismantling is assumed when no decommissioning timeframe has been announced*

Number of reactors in decommissioning estimates based on Illustrative scenario



[Source: IAEA Safety Reports Series 36 (2004)]



Preparatory Activities for Decommissioning*

- Preparations for spent fuel removal (may include construction of dry fuel store)
- Possible removal of spent fuel to interim storage facilities*
- Physical and radiological characterization*
- Decontamination (e.g. chemical decontamination of primary circuit)*
- Removal of hazardous and flammable materials (e.g. asbestos)*
- Removal of operational waste
- Modification of systems, structures and components (SSC) for decommissioning *[based on safety analysis of decommissioning activities]*
- Dismantling of non-nuclear facilities (office buildings etc.)*
- Dismantling of peripheral facilities (in the case of some deferred dismantling strategies)

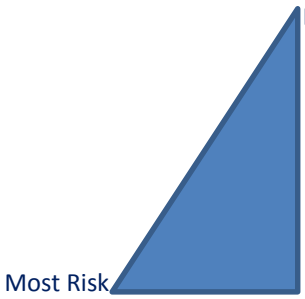
** Several of these activities may also be part of the main dismantling phase*

Preparatory Activities for Decommissioning

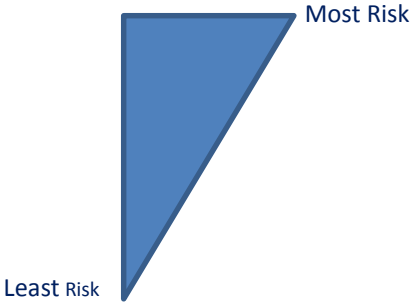
- Activities that must be performed to place the facility into a position to implement the next phase
- Will depend on the selected strategy
- If Immediate Dismantling is the selected strategy
  - Plant Configuration Actions - Update systems, expand change rooms, new systems
  - Administrative Actions - Contract subcontractors, organize staff, prepare work procedures, procure equipment and supplies
- If Deferred Dismantling is the selected strategy
  - Plant Configuration Actions – Dismantle redundant systems, isolate areas, modify security systems
  - Administrative Actions – Reorganize staff, prepare detailed surveillance & maintenance plan

Contract Strategies for Decommissioning

Approach to risk allocation/sharing between Owner and Contractor



- Lump sum or fixed Price contract
- Bill of Quantities or Unit Price contract
- Cost Reimbursable Contract
- Target Cost Contract
- Time and Materials Contract



Owner Risk

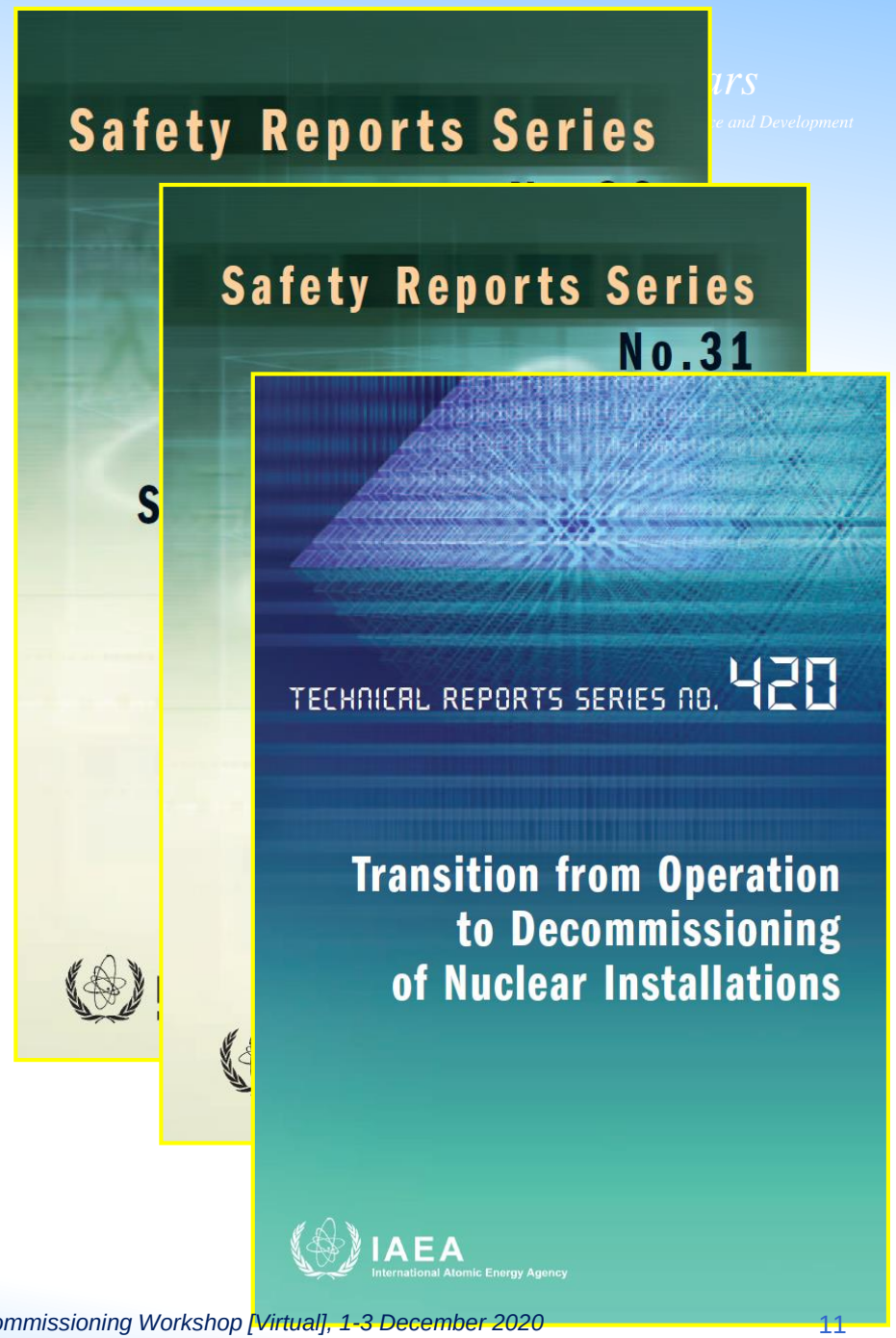
Contractor Risk

Conclusions

Licensing & EIA Issues	• Develop safety analysis report for defuelled condition • Decommissioning Licence or PSDAR (US) • Environmental Impact Assessment and stakeholder engagement
Engineering Issues	• Development of System Abandonment Criteria • Reduction/Downgrade of Operating Systems • Prepare revisions to Maintenance Programmes
Staff, organization and communication Issues	• Develop Early Retirement /Employee Retention Plan • Implement revised organizational structure/ staffing plans • Develop change management and training programmes • Develop Communications Plan
Initiate Decommissioning Work	• Develop Contract Strategies and Perform Bid Evaluations • Perform a Comprehensive Facility and Site Characterization

IAEA Guidance Docs

- Safety Considerations in the Transition from Operation to Decommissioning of Nuclear Facilities, Safety Reports Series 36, 2004
- Managing the Early Termination of Operation of Nuclear Power Plants, Safety Reports Series 31, 2003
- Transition from Operation to Decommissioning of Nuclear Installations, Technical Reports Series 420, 2004



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Thank you!

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International Good Practice in Preparing for Decommissioning during Operation and after Final Shutdown

Boris Brendebach
on behalf of a OECD/NEA WPDD Expert Group

SHARE Workshop – 3rd December 2020

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Task Group PFD

Task Group on Preparing for Decommissioning during Operation and after Final Shutdown

- Launched in 2014 - completed 2017
- Focus:
  - Optimisation of preparation for decommissioning in the last years of operation
  - Safe transition and preparation for dismantling of nuclear facilities after permanent shutdown

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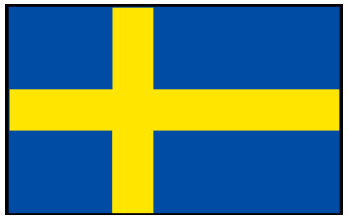
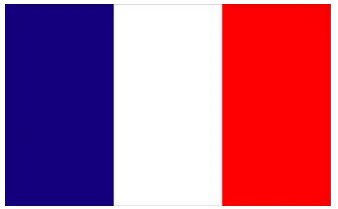
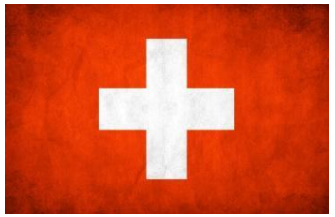
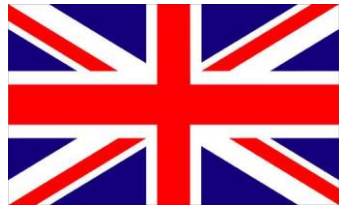
Task Group PFD

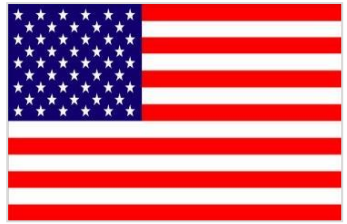
Task Group composition:

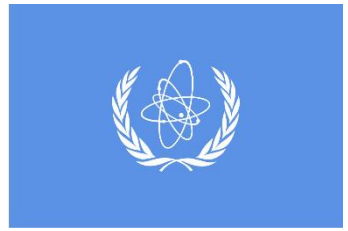
- Dismantling Experts
- Decommissioning organisations
- Independent experts
- Regulators
- Specialist consultants
- Utilities
- Waste Management organisations

Representatives from 9 countries







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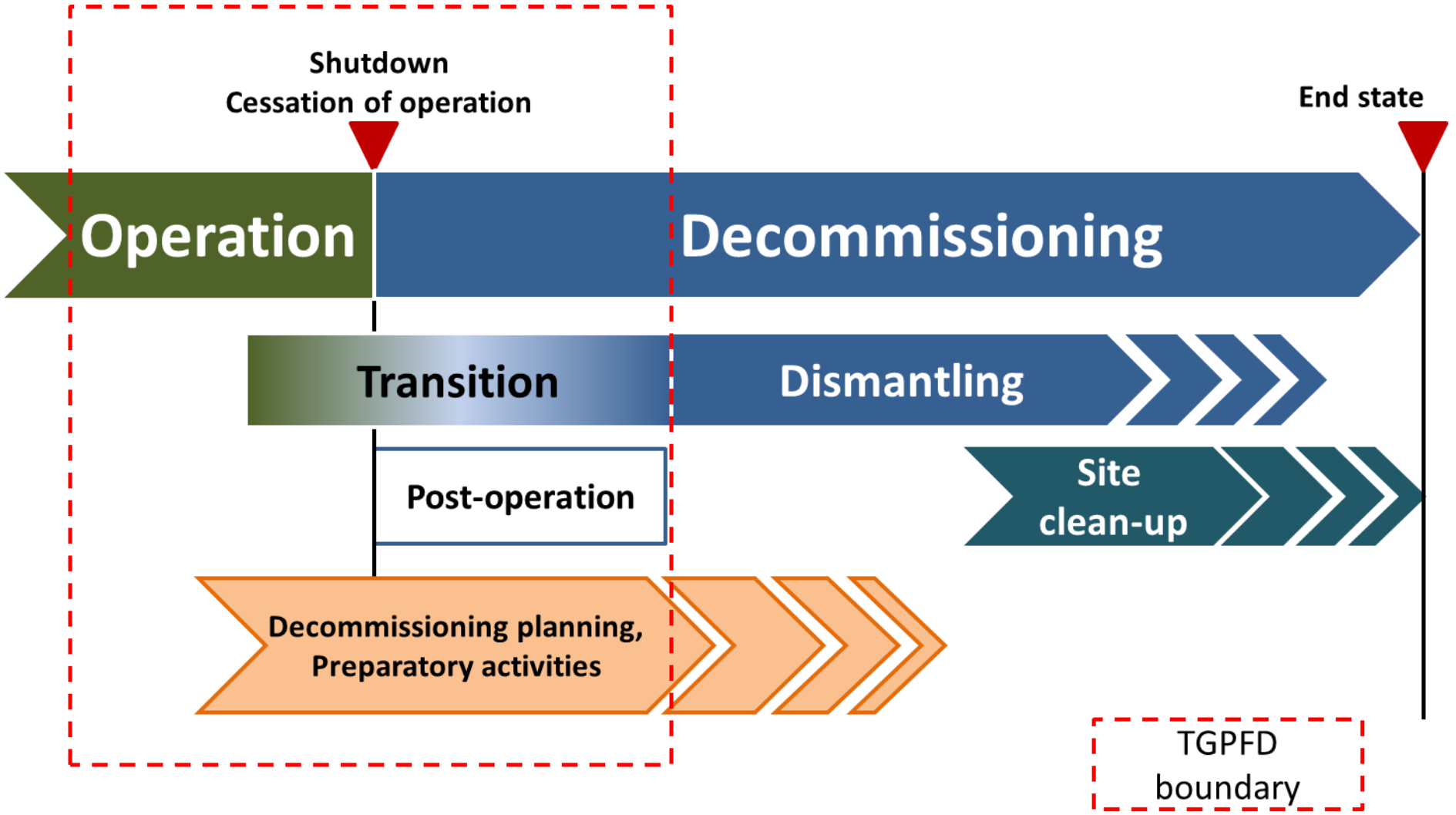
Scope of Task Group PFD



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Outcomes

5 main topical areas identified

- Setting the strategy for decommissioning
- Technical activities to prepare for decommissioning
- Regulatory framework and authorisation for decommissioning
- External stakeholders
- Organisational transition

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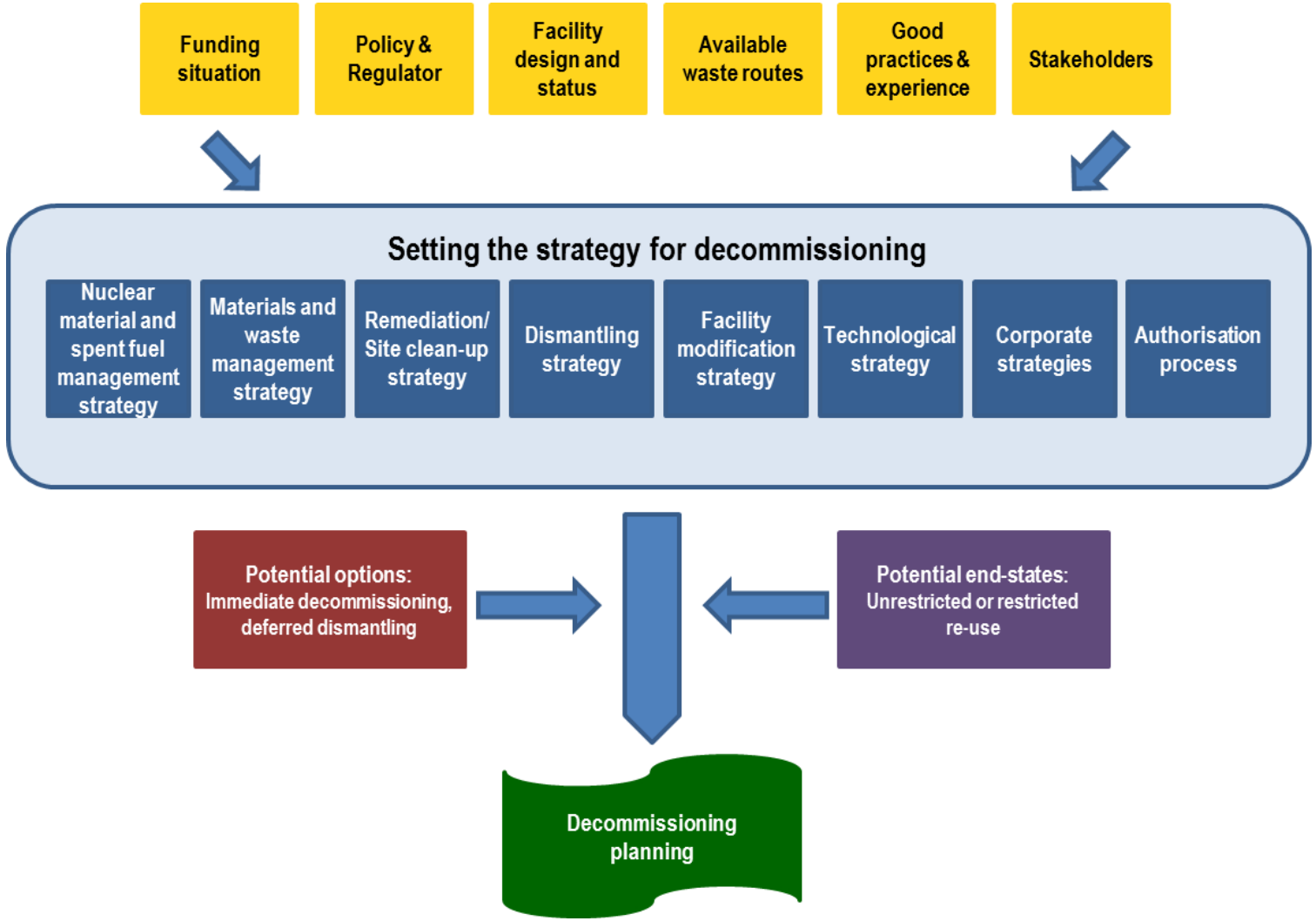
Setting the Strategy for Decommissioning



R&D Needs and Opportunities

As part of the technoligical strategy identify R&D needs

- initiation R&D activities in line with the needs of the decommissioning project and fitting into its planned purpose;
- qualification of innovative technologies to prove that its deployment meets the safety requirements;
- interaction with stakeholders involved in the introduction and deployment of the technology, such as the regulatory body

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R&D Needs and Opportunities

As part of the technoligical strategy identify R&D opportunities

- to reduce the cost, duration, and environmental impact of decommissioning projects through innovation;
- identification of areas in an upcoming decommissioning project or in a decommissioning programme with multiple nuclear facilities;
- from a review of the assets, a review of operational instructions and maintenance requirements, as well as exploring technological development including research;
- retain the flexibility for recognition and incorporation of new technologies

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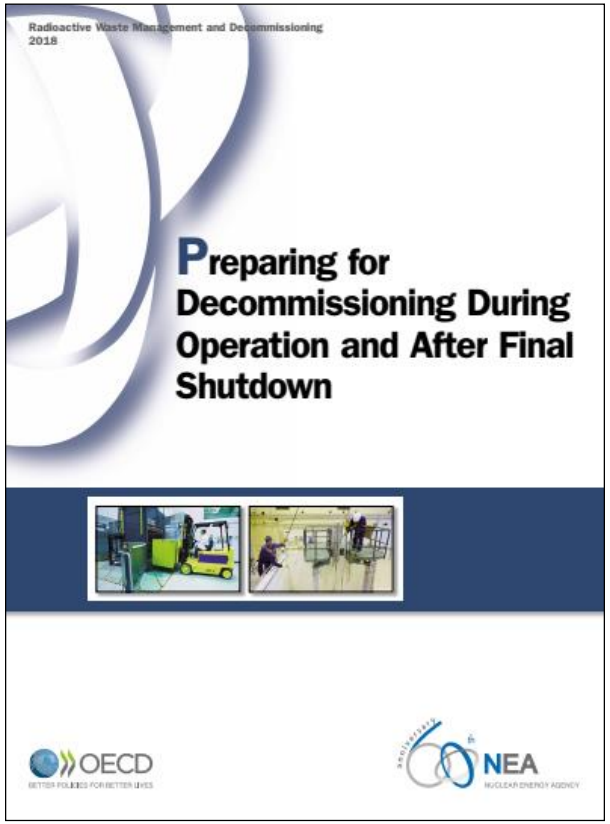
Task Group PFD Report

Report available under:

https://www.oecd-nea.org/jcms/pl_15058



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THANK YOU FOR YOUR ATTENTION !

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Chair: Boris Brendebach (Germany)

NEA Secretariat: Inge Weber