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INTERNATIONAL ATOMIC ENERGY AGENCY'S PERSPECTIVES ON GLOBAL APPROACHES TO SMR AND ADVANCED REACTOR LICENSING

Regulatory Information Conference
10 March 2022

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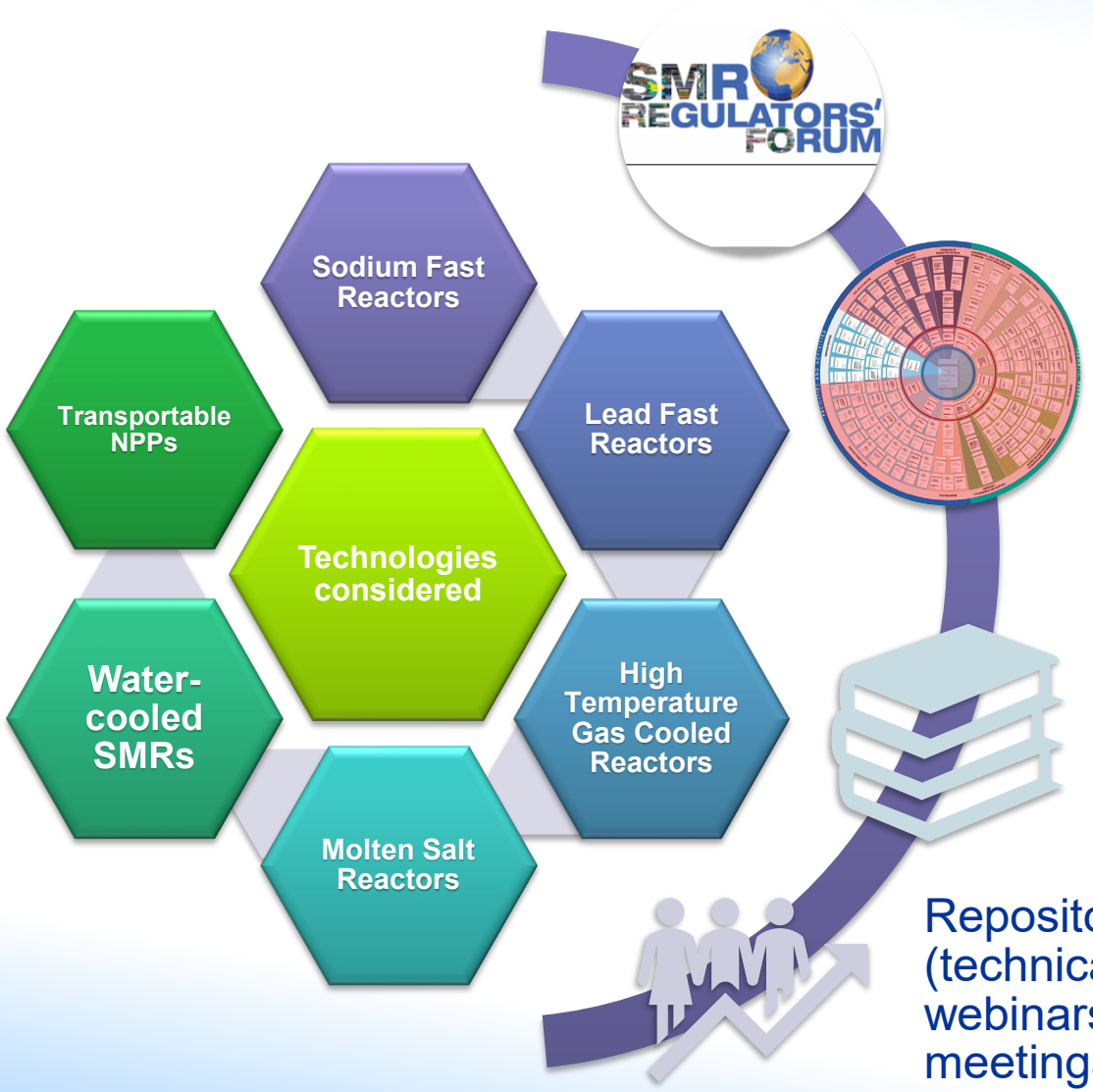
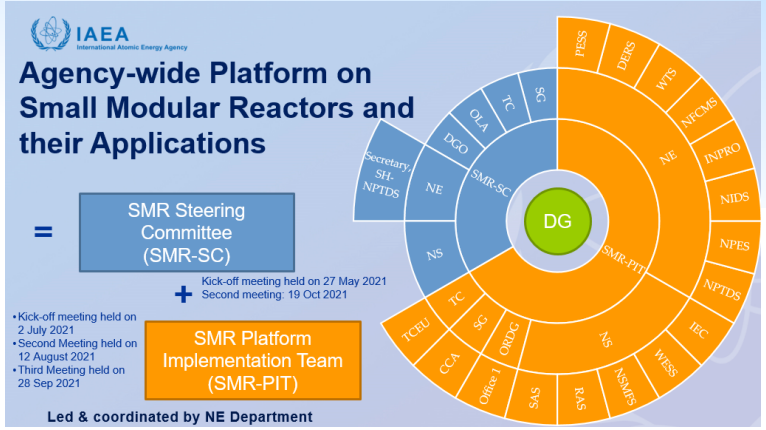
IAEA Work on Non-Water-Cooled Reactors (Non-WCR) and Small Modular Reactors (SMR) Safety



Review and potential adjustment of applicability of safety standards

Practical application of safety standards and gathering experiences

Repository of knowledge (technical documents, webinars, training, technical meetings and conferences)



Webinar on Safety, Security and Safeguards Interfaces and Challenges for Novel Advanced Reactors

The purpose of this webinar is to provide an overview to interested stakeholders from industry and regulatory bodies of the outcomes of the IAEA activity on safety, security and safeguards considerations for NARs, covering challenges and interfaces. Furthermore it will serve as a forum for discussions and promote the holistic approach towards safety, security and safeguards in early design stages of NARs and present an overview of other IAEA activities in this area.

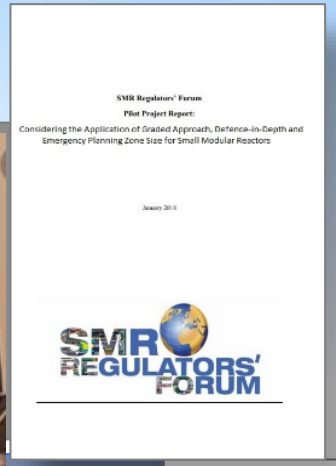
Webinar on IAEA Applicability of IAEA Safety Standards to the Design of Novel Advanced Reactors including SMRs

This webinar will provide an overview to interested stakeholders from industry and regulatory bodies of the outcomes of the review of applicability of IAEA Safety Standards to NARs, with focus on the design safety and give an insight of the activities that the IAEA has planned to address the findings of the review and produce additional guidance where needed.

SMR Regulators Forum: Areas of Work

Phase 1 (2015 - 2017)

- Graded Approach
- Defence-in-Depth
- Emergency Planning Zone Size



SMR Regulators' Forum

Pilot Project Report:

Considering the Application of Graded Approach, Defence-in-Depth and Emergency Planning Zone Size for Small Modular Reactors

January 2018

SMR REGULATORS' FORUM

Phase 2 (2018 - 2020)

- Licensing Issues
- Design and Safety Analysis
- Manufacturing, Commissioning and Operation

SMR REGULATORS' FORUM

SMR Regulators' Forum
Phase 2 Summary Report:

Covering Activities from
November 2017 to December 2020

for:

Licensing Issues Working Group

Design and Safety Analysis Issues Working Group

Manufacturing, Construction, Commissioning, Operation Working Group

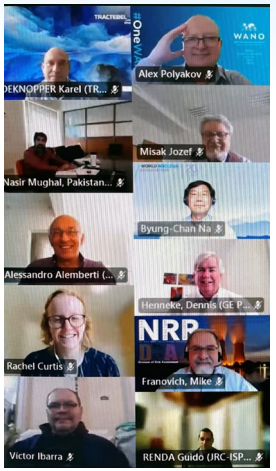
June 2021

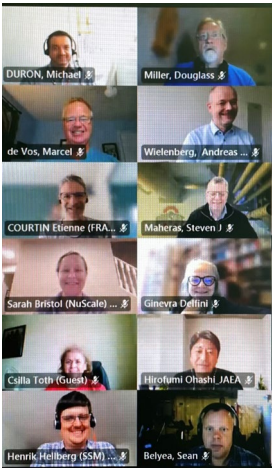
Phase 3 (2021 -)

- Further strengthening collaboration between regulators
- Safeguards/Security by design
- Manufacturing models, commissioning, long lead items

SMR REGULATORS' FORUM

Applicability of IAEA Safety Standards

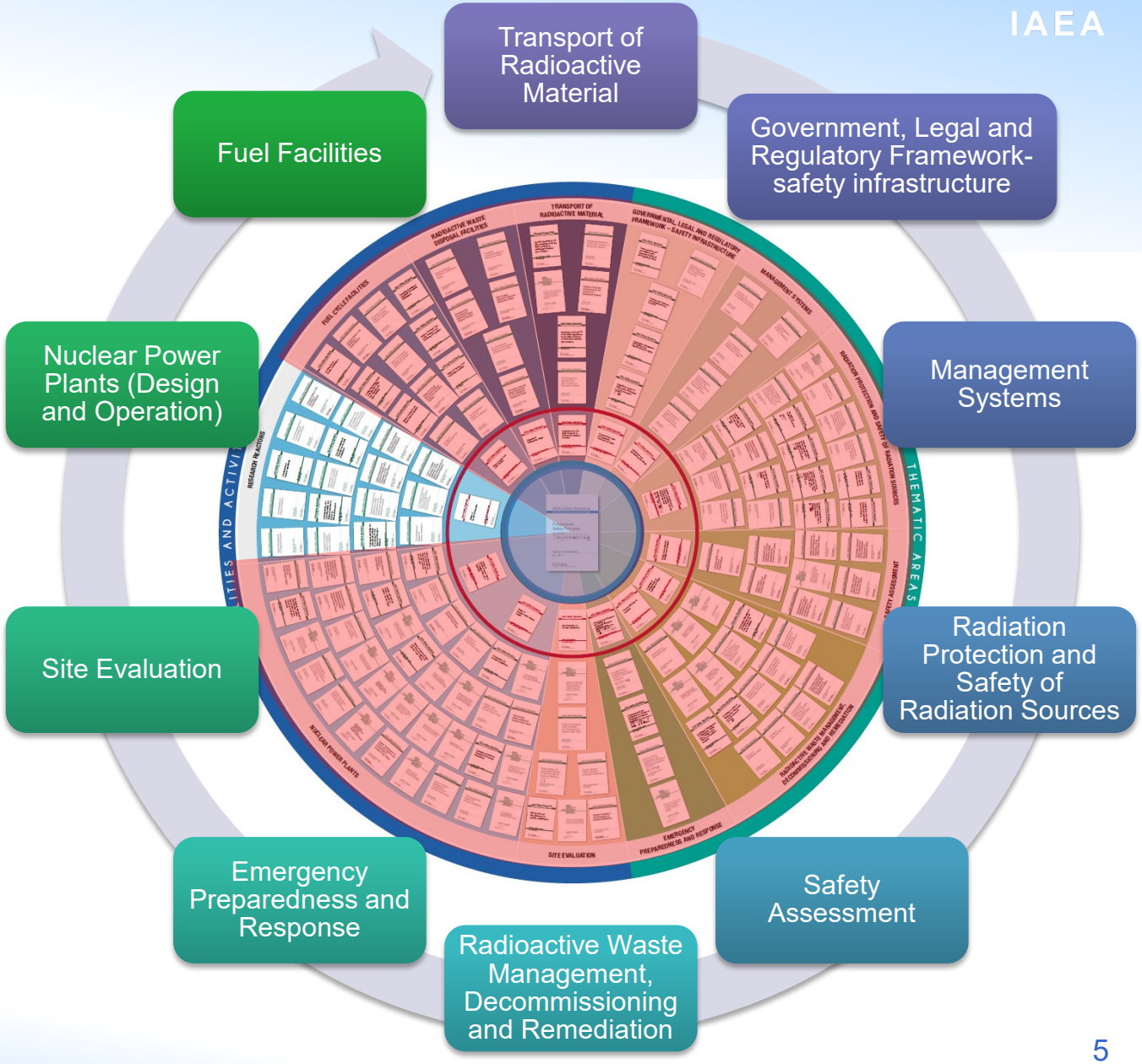




- Safety standards are generally applicable
  - Some areas not fully applicable or could be adapted for a better application
  - Some areas of novelty not fully covered

  For most cases, issues identified may merit additional work but may not need to be reflected in the safety standards

- Review captured in a safety report



Key Challenges Identified

IAEA

Safety Standards applicability to design and safety analysis for non-WCRs and design and transport of TNPPs

- Clarification of intent may be possible
- Direct application may lead to ‘unwanted’ results

Differences with large WCRs may have safety implications not captured in safety standards

- Phenomena, failure modes, hazards, source term, waste
- Design features, manufacturing approaches
- Alternative operating models
- Deployment models (supply chain, waste management, decommissioning, regulation, transport)

How to consider designs for which there is a lack of regulatory and operating experience?

- Design
- Manufacturing
- Safety Assessment
- Emergency Preparedness
- Interface Safety Security Safeguards

Need for increased cooperation among regulators

A Way Forward

Areas of focus for future IAEA safety activities

1. Enhance applicability of **safety standards** to SMRs and Non-WCRs

2. Develop publications to capture **practical examples** of application of safety standards for specific technologies

3. Develop a repository of technology specific **knowledge**

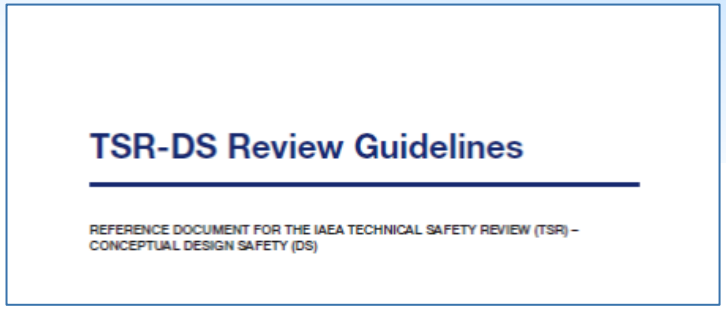
A Way Forward

Strengthening our work with regulators licensing SMRs and NWCRs

1. Working together in Technical Review Services for Conceptual Designs

2. Developing effective regulatory cooperation on design assessment, following from the recommendations of the SMR Regulators Forum

3. Further strengthening regulators' collaboration to address efficiently and timely the specific features of SMRs while ensuring high levels of safety and security


TSR-DS Review Guidelines

REFERENCE DOCUMENT FOR THE IAEA TECHNICAL SAFETY REVIEW (TSR) – CONCEPTUAL DESIGN SAFETY (DS)

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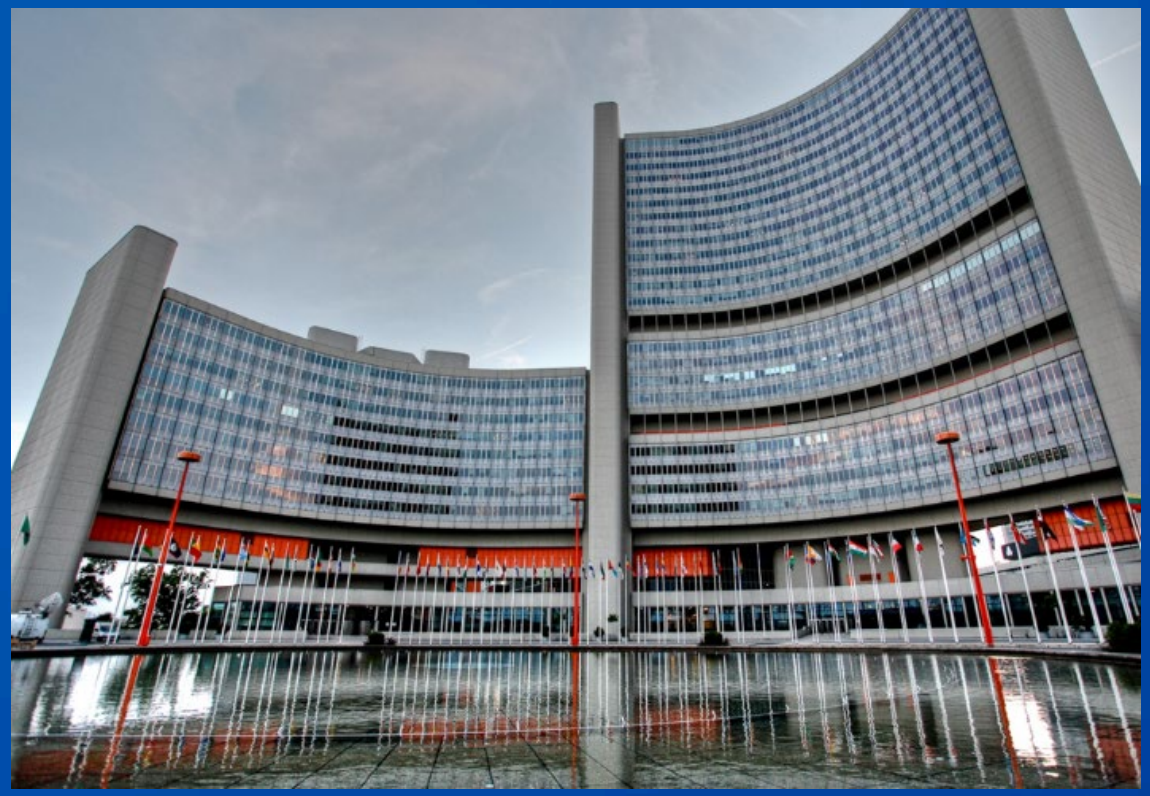

Thank you!

Questions?