

SMR REGULATION: IAEA RELATED ACTIVITIES

A multi pronged approach towards small modular reactor regulation Date: 28 July 2021 CIL Webinar

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Outline



- SMR definition
- SMR Regulators' Forum
- IAEA initiatives on safety and regulation
- Potential legal challenges
 - International legal instruments
 - National legal challenges

SMR definition



<u>Small Modular Reactors are Nuclear Power Plants</u> that typically have several of these features:

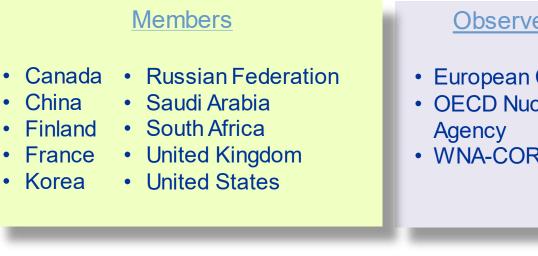
- Nuclear reactors typically <300 MWe or <1000 MWt per reactor;
- Designed for commercial use (include prototypes or demonstration plants), i.e., electricity, production, desalination, process heat (as opposed to research and test reactors);
- Designed to allow addition of multiple reactors in close proximity to the same infrastructure (modular reactors);
- May be light or non-light water cooled;
- Use novel designs that have not been widely analysed or licensed by regulators.

No reference to placement: they could be deployed in land or marine (floating or submerged) environment

What is the Forum?



Regulator-to-Regulator group with 10 participating countries



Observers:

- European Commission (JRC)
- OECD Nuclear Energy
- WNA-CORDEL

Terms of Reference hault Medular Reactor (NMR) Regulatory' Forum March 2401

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Objectives of the Forum



Share regulatory experience amongst Forum members preparing to:

- Facilitate efficient, robust, and thorough regulatory decisions
- Encourage enhanced nuclear safety and security
- Facilitate international cooperation among regulators performing SMR-related assessments
- Identify and discuss common safety issues that may challenge regulatory reviews associated with SMRs and, if possible, recommend common approaches for resolution
- Advise IAEA on the need for revision of development of new IAEA publications on safety of SMRs



Outcomes of the Forum



- Position statements on regulatory (policy and technical) issues
- Makes suggestions for revisions of, or drafting of, IAEA documents, especially on potential enhancements to the IAEA Safety Standards with respect to SMRs
- Generation and sharing of information that regulators may use to enhance their regulatory framework
- > Description of regulatory challenges and discussion on path forward
- Suggestions for high level issues to be raised to international codes and standards organizations for dispositioning



Areas of technical work of the SMR Regulators' Forum



Phase 1 (2015 - 2017)

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

Phase 2 (2018 - 2020)

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

Phase 3 (2021 -)

Just started





Phase 3 of the Forum: Started in 2021



Licensing WG

- Mutual recognition of regulators' assessment/ Joint assessments/ Collaboration
- Identification of legal constraints

Design and Safety Assessment WG

- Security by design, interface with safety (Can, UK, USA, SA, Fin)
- Safeguards by design (may only include input presented by Safeguards Department)
- Containment/confinement

Maintenance, Construction, Commissioning and Operation WG

- Regulatory oversight of long lead SSC procurement
- Organizational stakeholders' capabilities (Designers, Vendors, Manufacturers, Supply chains, Operators)

Promotion of the Forum's Work to Other MSs



Organized as Regional WSs

Target audience: MS Regulatory Body staff

To be divided into 2 components:

- IAEA to present progress made on all fronts of SMRs (technology, safety, legal)
- Forum members to present the Forum's outputs
- 1 WS in Q4-2020 (venue TBD, Region: West Asia/Africa)

4 WS planned in 2022

- AMSSNUR-Morocco March 2022
- ARN-Argentina, June 2022
- East Asia, Central-East Europe

Funded through Forum members' EB contributions

IAEA Initiatives on safety and regulation



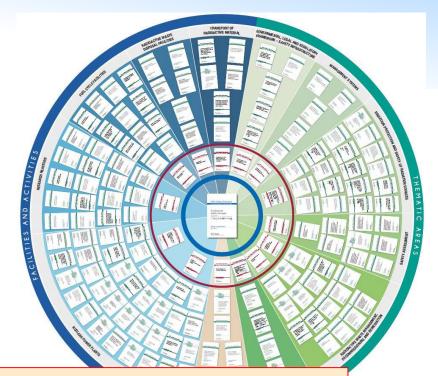
- Review of Applicability of IAEA safety standards to SMR technologies
- Gathering experience in regulating SMRs

Applicability of IAEA Safety Standards to SMR Technologies



Applicability Assessment

- A high-level review of Safety Standards and Guides applicability to SMRs and other novel advanced reactors throughout their entire lifecycle
- Three consultancy meetings: March, May and July 2021
- Provides basis for a Safety Report on the roadmap for application of Safety Standards to SMRs (to be completed end 2021)
- Provides the basis for the development of a prioritized program of work to address gaps areas of non-applicability (beyond 2021)



Results expected to be published this year as Safety Report

Gathering Experience in Regulating SMRs

- Compiling experience of Member States which: \geq
 - 1. have gone through the process of licensing and regulating SMRs; or
 - 2. have worked intensively in preparing to licensing SMRs
- \geq Developed a complete set of questions about challenges in different areas and how they resolved them
- The questionnaire covered challenges to framework, \succ safety requirements, licensing process and regulatory approach, inspection, security, safeguards, etc

IAFA TECDOC SERIES IAFA-TECDOC-XXXX International Experience in the Regulation of Small Modular Reactors RAF Expected to be published this year as TECDOC IAEA



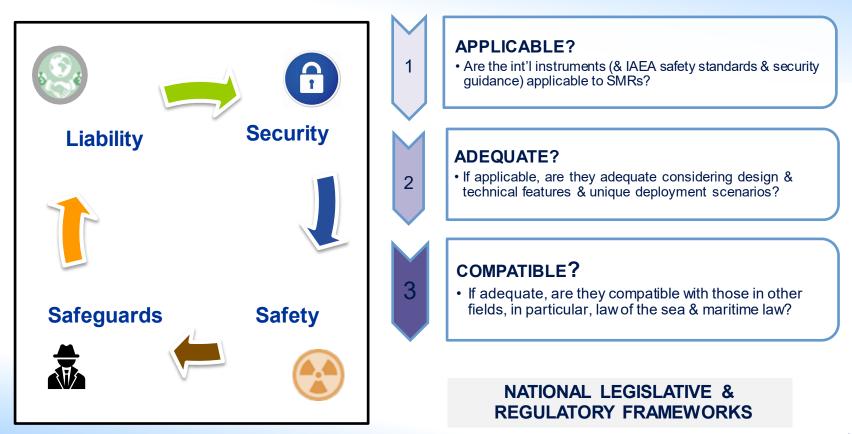
Potential Legal Challenges



- Applicability and adequacy of International Instruments
- National legal challenges associated with SMR deployment models
- To be addressed under the SMR RF Licensing Working Group and in various consultancy meetings or fora

International Legal Frameworks (1/2)





International Legal Frameworks (2/2)



Nuclear Law

- Civil Liability
- Safety
- Security
- Safeguards

Maritime Law



(INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, 199-

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IAEA Safety Standards for protecting people and the environment Regulations for the Safe Transport of Radioactive Material 2018 Edition Specific Safety Requirements No. SSR-6 (Rev. 1)

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National Legal Framework







modularization (factory construction & configuration)



- Challenges associated with deployment models of SMRs
 - Impact on main regulatory activities of the Regulatory Body (authorisation, inspections, enforcement)
- Harmonisation/Standardisation





Thank you!

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