

SMR REGULATION: IAEA RELATED ACTIVITIES

A multi pronged approach towards small modular reactor regulation

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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

Small Modular Reactors are Nuclear Power Plants 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

Members

- Canada
- China
- Finland
- France
- Korea
- Russian Federation
- Saudi Arabia
- South Africa
- United Kingdom
- United States

Observers:

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



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



Expected to be published this year as TECDOC

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)



1

APPLICABLE?

- Are the int'l instruments (& IAEA safety standards & security guidance) applicable to SMRs?

2

ADEQUATE?

- If applicable, are they adequate considering design & technical features & unique deployment scenarios?

3

COMPATIBLE?

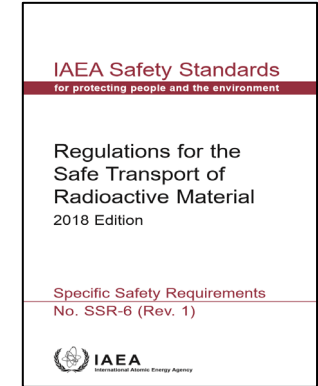
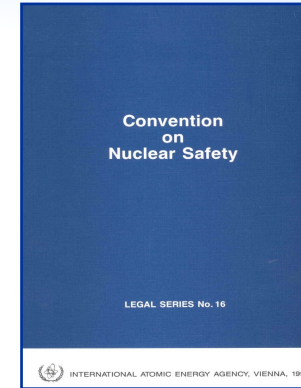
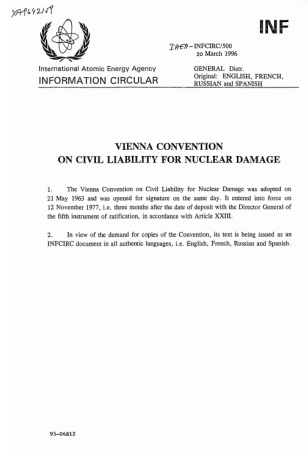
- If adequate, are they compatible with those in other fields, in particular, law of the sea & maritime law?

**NATIONAL LEGISLATIVE &
REGULATORY FRAMEWORKS**

International Legal Frameworks (2/2)

Nuclear Law

- Civil Liability
- Safety
- Security
- Safeguards



Maritime Law

National Legal Framework

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



modularization
(factory construction & configuration)





IAEA

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Atoms for Peace and Development



Thank you!

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