

International Conference on Small Modular Reactors and their Applications



Monday, 21 October 2024 - Friday, 25 October 2024

Vienna

Scientific Programme

The purpose of this conference is to provide an international forum to take stock of the progress and discuss the opportunities, challenges and enabling conditions for the accelerated development and safe and secure deployment of SMRs among all possible stakeholders for SMRs. It is expected that this conference will help catalyse current activities in Member States and enhance prospects of safe and secure SMR deployment that will offer options for achieving clean energy transition and energy supply security in both embarking and expanding countries. Below you can find the thematic tracks for the conference.

Topical Group A: SMR Design, Technology and Fuel Cycle

Track 1: Design and Technology Development of SMRs

Research and development (R&D) for SMR designs of major technology lines; Concepts of modularity, design simplification and integration; Reactor physics and thermal hydraulics analyses and simulation, and experimental activities for design validation.

Track 2: Advanced fuels, reprocessing, waste management and decommissioning aspects for SMRs – Safety, Design and Technology

Research and development (R&D) in advanced fuel designs and technologies; fuel cycle options for SMRs; use of HALEU and higher burnups fuels; SMR designs for decommissioning; Decommissioning of non-water cooled SMRs; Waste generation and management, including transport of SMR spent fuel and waste.

Track 3: Engineering, Codes & Standards, Supply Chain, Operation and Maintenance of SMRs

Issues and challenges in the engineering of SMR designs; Applicability of the current codes and standards; Harmonization initiatives in C&Ss and their oversight; Procurement engineering and supply chain readiness in support of SMR deployment; Approach and preparation of operation for SMRs; simulators; construction technology, Human factor engineering for SMRs.

Track 4: Transportable SMRs

Microreactors and their specificities including life cycle; Floating NPPs; Transporting spent fuel from FNPP; Licensing aspects of T-SMR; Safety of transportable SMRs; SMRs for special applications.

Track 5: Non-Electric Applications for SMR

SMRs for cogeneration of electricity and industrial process heat; Viability of seawater desalination technology; Nuclear hydrogen production: prospects and challenges; Issues of coupling; Considerations of safety, regulation and stakeholder involvement of non-electric applications; Siting consideration; SMRs for Hybrid Energy Systems.

Topical Group B: Legislative and Regulatory Frameworks

Track 6: International and National Legal Frameworks and SMRs

International nuclear law instruments and their application and adequacy, challenges or gaps; Other areas of international law, such as environmental law, environmental impact assessment, law of the sea, maritime law, international waste management and transboundary movement and complementarity with nuclear law instruments; National legal frameworks including the regulatory body and its functions, facilitation of cooperation and information sharing among regulatory bodies and support organizations.

Track 7: Regulatory Considerations for SMRs

Regulatory body lessons learned from assessing SMRs; Regulatory body preparation or challenges in addressing SMRs; Innovation in regulatory frameworks to address new and advanced technologies.

Topical Group C: Safety, Security and Safeguards

Track 8: Demonstrating SMR's Safety Case

Safety objectives and application of defence-in-depth to SMRs; Inherent and passive safety features; Safety challenges and opportunities related to design simplification, integration and modularity; Severe accidents and conditions to be practically eliminated; Internal and external hazards; Fuel and core safety; Materials and chemistry safety implications; Risk-informed approaches for SMRs; Novel deployment models and related implications on the leadership and management of safety.

Track 9: Emergency Preparedness and Response for SMRs

Emergency preparedness and response (EPR) for SMRs deployed in areas with high population density; EPR for SMRs deployed in remote areas; EPR for single-module SMRs "vs." EPR for multi-module SMRs; EPR for SMRs sited near industrial sites being used for non-electric applications.

Track 10: Safety, Security and Safeguards Interfaces related to SMRs

General approaches to implement safety by design, security by design and safeguards by design for SMRs; Potential challenges and synergies in consideration of 3S interfaces in the SMR design stage; Examples and practices on considering the 3S interfaces in design in an integrated manner; Technical design solutions to address 3S related challenges connected with the novelties in SMR technologies.

Track 11: Security of SMR: Physical Protection and Computer Security

Physical protection for SMR designs and deployment approaches; Security by design considerations; Challenges arising from SMR designs and operation that impact instrumentation and control (I&C), human factors, and computer security; Remote and autonomous operation aspects; Specific computer security challenges brought by SMRs.

Track 12: Safeguards for SMRs

Addressing safeguards needs for newcomer nuclear countries procuring SMRs; Addressing safeguards challenges for operations of advanced SMR technologies and fuels; Addressing safeguards challenges for non-traditional deployment (e.g., factory-fuelled TNPP/FNPP, remote microreactor fleets, multi-module operations).

Topical Group D: Considerations to Facilitate Deployment of SMRs

Track 13: SMRs in Energy Planning for Climate Change Mitigation

Advanced and hybrid energy systems using SMRs incorporating non-electric applications, including energy storage and hydrogen production; The role of policy makers in decision making on energy planning using SMRs.

Track 14: Nuclear Infrastructure and Enabling Environment for SMRs

Benefits and challenges of embarking MSs adapting their roadmaps to nuclear power with SMRs; Support of SMR technology holders in capacity building; Bilateral/multilateral regulatory and technical cooperation to facilitate SMR reviews/deployment; Human resource development; Addressing challenges in capacity/skills building in deploying SMRs in international environments; Public Engagement / stakeholder involvement in development phase).

Track 15: Financing, Cost & Economic Appraisals and Contracting Approaches for SMR Projects

Estimation, analyses and optimization of development costs, construction and operations expenses of SMRs; Revenue models for demonstrating business case and securing access to funding and financing; Macroeconomic impact of SMR development; Lifecycle cost of operating and decommissioning SMRs; Viable deployment and business models of SMRs; The economics of SMRs for repurposing retiring fossil-based plants.

Track 16: Public and Stakeholder Engagements in SMR Development and Deployment

Public engagement in the deployment of SMRs; specific challenges on SMRs; Involvement from non-nuclear stakeholders including hydrogen producers; Innovative tools and communication strategies or initiatives to facilitate SMR deployment; Engagement of investors to fund SMR projects; Engaging young generations via inter alia specific curriculum introduction in basic education.

Track 17: Cooperation for Harmonization and Standardization

Bilateral and multilateral cooperation on assessing SMR designs; Regulatory body approaches and experience leveraging others' regulatory reviews; Projects toward international harmonization of safety requirements; Experience/lessons learned from other industries related to international harmonization and standardization; Vendors' approaches towards standardization to enable global deployment.