SMR REGULATORS' FORUM

NEWSLETTER
Issue 4
March 2025

The DSA Working Group Chair's Welcome

Welcome to the fourth issue of the Small Modular Reactor Regulators' Forum's (SMR RF) Newsletter!

In the time since the previous issue of the Newsletter, significant progress has been made in the international regulation of small modular reactors (SMRs) and advanced nuclear technologies. The SMR RF held its biannual meeting from 11 to 15 November 2024, bringing together regulatory bodies from 19 countries and three permanent observers. Under the leadership of the new Chairperson, Mr Samuel Lee, from the US Nuclear Regulatory Commission (NRC), the Forum focused on advancing key regulatory topics, such as: the challenges of licensing first-time nuclear operators, manufacturing and deployment in the absence of a licensee, 3S in remote locations and mechanistic source terms. The meeting also highlighted the continued success of the Nuclear Harmonization and Standardization Initiative (NHSI), especially in its collaboration with industry representatives, including entities such as Westinghouse, GEH and Nuward, to promote regulatory convergence.

A key theme throughout the meeting was the growing global collaboration on SMR regulation. In particular, the Canadian Nuclear Safety Commission (CNSC) and NRC have been working together under a Memorandum of Cooperation (MOC) signed in 2019 to share regulatory experiences and streamline the review of SMR technologies. This collaboration was further strengthened in March 2024, when the CNSC, NRC, and the UK's Office for Nuclear Regulation (ONR) signed a historic trilateral MOC. This new agreement facilitates the exchange of information, joint regulatory efforts, and the development of best practices to ensure the safe and efficient deployment of new nuclear technologies.

An important milestone in this international cooperation is the ongoing review of the BWRX-300 design. In 2022, the NRC and CNSC began a joint project focused on this reactor design. Recently, the CNSC held public hearings to consider an application from Ontario Power Generation for the license to construct the BWRX-300 reactor, marking a key step in advancing the licensing process for this innovative technology. This collaboration between regulatory bodies, coupled with the industry's input, continues to drive forward the standardization and regulatory alignment needed for the successful deployment of SMRs globally.

The SMR RF's role in this global effort remains crucial, with the Forum's members and observers meeting regularly to share information and discuss the evolving regulatory landscape. Looking ahead, the SMR RF will continue to support the development of regulatory frameworks and facilitate knowledge-sharing through educational workshops and forthcoming events. With such robust international collaboration, the regulatory community is well-positioned to guide the safe, secure, and efficient deployment of SMRs around the world.

Stay tuned for more updates as the global community continues to advance the future of nuclear energy with SMRs!

Ms Sanja Simic
SMR RF DSA Working Group Chair
Safety Analysis Lead of the Directorate of Assessment and Analysis
Canadian Nuclear Safety Commission (CNSC)

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Latest SMR Regulators' Forum (SMR RF) Meetings

The Combined SMR RF Steering Committee and Working Groups Meeting, including the 10th NHSI Regulatory Track WG3, 11-15 November 2024

Participants of regulatory bodies from **19 countries** (Belgium, Brazil, Canada, China, Czech Republic, Finland, France, India, Japan, Republic of Korea, the Netherlands, Poland, Romania, the Russian Federation, South Africa, Switzerland, Türkiye, United Kingdom (UK) and United States of America (US)), as well as the three permanent SMR RF Observers (European Commission (EC), Nuclear Energy Agency (NEA) and World Nuclear Association (WNA)) attended the SMR RF Fall 2024 meeting, held from 11 to 15 November 2024.

This Meeting was the first led by the new SMR RF Chairperson, Mr Samuel Lee from the US Nuclear Regulatory Commission (NRC), and Vice-Chairperson, Mr Paul Stenhoff from the UK Office for Nuclear Regulation (ONR).

SMR RF Chairperson, Sam Lee, and Vice-Chair, Paul Stenhoff, at the Steering Committee Meeting – 12 November 2024 (Photo: IAEA)

In her opening remarks, the Director of the IAEA Division on Nuclear Installation Safety (NSNI), Ms Anna Bradford, welcomed all SMR RF experts and other participants, and expressed her thanks to Mr Brian Smith and Mr Matthew Bamber for their leadership of the Forum over the preceding three years and to congratulate Mr Samuel Lee as the new Forum's Chairperson. She pointed out the importance of the IAEA cooperation with the Forum on Phase II of Nuclear Harmonization and Standardization Initiative (NHSI), which received the support of Member States (MS) during the third annual NHSI Plenary held in October 2024. Ms Bradford also mentioned the Forum's invaluable contribution to the future implementation of the Pilot School for Regulating SMRs. Finally, she noted the success of the side event commemorating the Forum's 10th anniversary organized at the first ever IAEA International Conference on SMRs held in October 2024.

SMR RF Opening Plenary – 11 November 2024 (Photo: IAEA)

In addition, the Forum's Members, the Observers and the IAEA delivered presentations on the status of their ongoing SMR-related activities. The European Commission presented the main objectives, principles, governance, technical working groups organization and timeline of the European Industrial Alliance on SMRs, launched on 6 February 2024. The NEA shared updates on its various frameworks supporting SMR safety assessment, such as the Multinational Design Evaluation Programme (MDEP) and the Joint Nuclear Safety Research projects, whose scope includes additional projects and phases relevant to SMRs. In turn, the WNA presented the latest updates on the Cooperation in Reactor Design Evaluation and Licensing (CORDEL) Working Group reports, the workshop held in Busan, Republic of Korea, from 21 to 23 May 2024, and the planned activities, including the collaboration with the NHSI Phase II and the development of a White Paper on floating nuclear power plants (FNPP) to be published in Q1 2025.

During the topical session, Ms Bradford provided an update on the Atomic Technology Licensed for Applications at Sea (ATLAS) project to be launched by the IAEA in 2025. ATLAS will create a framework to streamline the licensing process for nuclear technologies to be used for safe and secure civil applications at sea, addressing regulatory and legal complexities for FNPPs and nuclear-powered ships.

SMR RF Opening Plenary – 11 November 2024 (Photo: IAEA)

During the week, the DSA and MCCO Working Groups made progress on their Phase 4 topics hereinafter:

- Mechanistic source terms (DSA);
- Continuation of 3S (safety, security and safeguards) topics (DSA);
- Manufacturing and deployment in the absence of a licensee (MCCO);
- Construction oversight (MCCO);
- Organizational capability of a new licensee (no prior nuclear experience) (MCCO).

For the development of common positions on mechanistic source terms, the DSA WG also had a technical meeting with representatives of the Risk and Safety Working Group (RSWG) of the Generation IV International Forum (GIF). The next step for both WGs is to submit their interim reports to the respective Champions for review in early 2025.

The Forum-led NHSI WG, in its turn, outlined the scope of the work for phase II and a plan to deliver it. Industry representatives such as Westinghouse, Nuward, Hitachi and NEI attended the meeting and effectively contributed to the discussions.

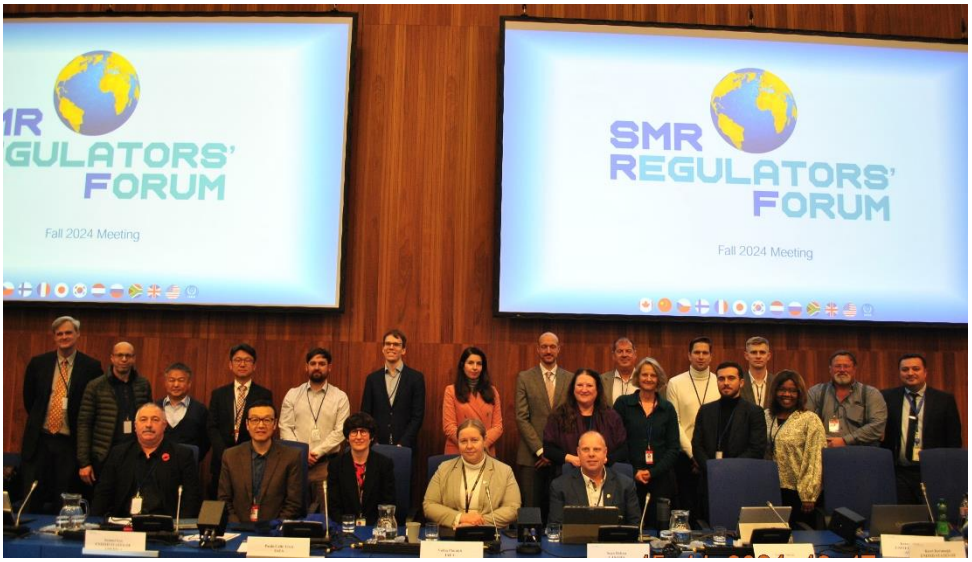
Representatives from the National Atomic Energy Agency (PAA) of Poland participated as observers in all SMR RF Working Group sessions, as part of its cooperation with the SMR RF to host the Pilot School for Regulating SMRs in 2025.

The Steering Committee Meeting – 12 November 2024 (Photo: IAEA)

The Steering Committee Meeting – 12 November 2024 (Photo: IAEA)

Following the successful Special Session on Technical Topics at the previous biannual meeting, this session was organized again and comprised presentations on the latest outcomes from the Rolls-Royce SMR Generic Design Acceptance (GDA) by the UK ONR, on the General Electric Hitachi (GEH) BWRX-300 reactor construction license review by the Canadian Nuclear Safety Commission (CNSC), and on the SMART-100 Standard Design Approval regulatory review by Korea Institute of Nuclear Safety (KINS). This session was restricted to SMR RF experts, where experiences and technical information about their recent SMR-related regulatory activities were shared and discussed.

SMR RF Special Session on Technical Topics– 13 November 2024 (Photo: IAEA)



SMR RF Final Plenary – 15 November 2024 (Photo: IAEA)

On the last day, in addition to the wrap-up presentations by each WG, the Final Plenary was enriched by the presentation on the safety regulation of FNPPs in the Russian Federation, made by the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor).

The SMR Regulators' Forum and NHSI Regulatory Track Working Group on Regulatory Cooperation Toolkit Consultancy Meeting, 20 – 22 January 2025

The purpose of this meeting was to, with the IAEA NHSI WG3 TECDOC as a starting point, develop guidelines for dealing with areas of regulatory differences (with implementation examples) and tools

and to support the practical implementation of the NHSI WG3 leveraging process. These tools and guidelines will be essential elements of the Regulatory Cooperation Toolkit. This NHSI WG is being led by the SMR RF Licensing Issues WG.

This virtual meeting was held with the participation of both nuclear regulatory authorities and industry representatives from **20 IAEA Member States** (Belgium, Brazil, Canada, Czechia, Finland, France, Germany, India, Japan, the Republic of Korea, the Netherlands, Poland, Romania, the Russian Federation, Slovenia, Switzerland, Türkiye, United Arab Emirates, United Kingdom and the United States of America), as well as from the Nuclear Energy Institute (NEI), the NEA and WNA.

The SMR RF at the US NRC's Annual Regulatory Information Conference (RIC)

The U.S. Nuclear Regulatory Commission's Annual Regulatory Information Conference is the largest public meeting the agency hosts, bringing together over 3,000 in-person or remote attendees from more than 40 countries representing interested stakeholders from other government agencies, industry, international organizations, and the general public. It offers an open environment in which diverse groups of stakeholders may learn, share, and discuss information on significant and timely nuclear regulatory activities and emergent issues.

The SMR RF hosted a resource table at the 37th NRC's Annual RIC, held from 11 to 13 March 2025, in Maryland, USA. The table was supported by the NRC representatives to SMR RF.

SMR RF table at RIC (Photo: NRC)

In Focus: Regional Educational Workshops on Regulatory Challenges of SMRs

Regional Educational Workshop, Mumbai, India, 9 -13 December 2024

Hosted by the Atomic Energy Regulatory Board (AERB), the seventh SMR RF Regional Workshop came back to the Asian region in December 2024. It was held at the Department of Atomic Energy (DAE) Convention Centre, in Anushaktinagar, **Mumbai, India, from 9 to 13 December 2024**. **Twenty-one** participants from **ten IAEA Member States** (Bangladesh, India, Indonesia, Iran, Kenya, Malaysia, Russian Federation, Thailand, Viet Nam and Singapore) had the opportunity to attend lectures delivered by the SMR RF experts and the SMR RF Scientific Secretariat on Forum's common positions with respect to SMR regulation and the SMR-related IAEA activities. Additionally, the participants shared information on the legislative and regulatory frameworks in their countries and prospects for/status of SMR deployment. The workshop included a visit to the Bhabha Atomic Research Centre (BARC).

Mr Dinesh Kumar Shukla, AERB's Chairman, and Ms Anna Bradford, Director of the IAEA Division of Nuclear Installation Safety, during the Opening Remarks, 09 December 2024 (Photo: IAEA)

The India Workshop Participants during the presentations, December 2024 (Photo: AERB)

The India Workshop Participants at DAE Convention Centre, December 2024 (Photo: AERB)

In Focus: The new SMR RF website on RegNet

The SMR RF is excited to share its new public website hosted on the International Regulatory Network (RegNet).

SMR RF's landing page on the International Regulatory Network (RegNet)

RegNet is the portal for web-based international cooperation among nuclear safety and security regulators, allowing national and international actors to share regulatory knowledge, practices, and information and to foster collaboration on nuclear safety and security matters. RegNet is maintained by the IAEA, while the SMR RF website is maintained by the SMR RF Scientific Secretariat, also provided by the IAEA.

The new SMR RF website will provide more information about the Forum, its work and output to a wider audience. To facilitate navigation, it will be a well-structured platform that can be accessed by topic. Visitors can learn about the Forum's objectives, organization and membership. They can also obtain further information on the work carried out by the Forum, including educational workshops, and download the reports produced by the SMR RF Working Groups at each phase of their work. In

addition, all newsletters, webinar recordings and other Forum-related materials can easily be accessed through this new website.

We look forward to your visit at: https://gnssn.iaea.org/regnet/smr-forum/pages/default.aspx.

Forthcoming SMR RF Events

Biannual SMR RF SC and WG Meetings, including NHSI Regulatory Cooperation Toolkit WG Consultancy Meetings

SMR Regulators' Forum (SMR RF) and the SMR RF/NHSI Regulatory Track Working Group on Regulatory Cooperation Toolkit (hybrid, **Vienna, Austria, 7-11 April 2025**)

SMR Regulators' Forum (SMR RF) and the SMR RF/NHSI Regulatory Track Working Group on Regulatory Cooperation Toolkit (hybrid, **Vienna, Austria, 1-5 December 2025**)

Regional Educational Workshops on Regulatory Challenges in SMRs

The Africa Region (in-person, **Cape Town, South Africa, 2-6 June 2025**)

The eighth educational workshop will be hosted by the Government of South Africa through the National Nuclear Regulator (NNR). Presentations will be delivered in English.

- Nomination deadline: **1 April 2025**.
- For more information please visit: https://www.iaea.org/events/evt2404046

The Europe Region (in-person, **Warsaw, Poland, 1-5 September 2025**)

The ninth educational workshop will be hosted by the Government of Poland through the National Atomic Energy Agency (PAA). It will be organized as the 'Advanced Licensing Challenges' module of the Pilot School for Regulating SMRs, as described in the following section. Presentations will be delivered in English.

- Nomination deadline: **10 June 2025**.
- For more information please visit: https://www.iaea.org/events/evt2404047

Recent and Forthcoming IAEA Events and Publications of Relevance

Annual NHSI Regulatory Track Meeting (hybrid, Vienna, Austria, 8 April 2025)

This annual meeting will be open to all NHSI RT participants. The purpose of this meeting is to provide an update on all NHSI RT Phase II activities, exchange information, and gather lessons learned on regulatory cooperation activities. The meeting will also help foster knowledge exchange, collaboration, and discussions among experts involved in all activities under the NHSI RT including:

- Regulatory Cooperation Toolkit;
- SMR Regulation and Cooperation Hub;
- Implementation of Multinational Pre-licensing Joint Review Pilot;
- Step-by-step Blueprint to Establish a Global Framework for Regulatory Review;
- Nuclear Security of SMRs Working Group.

The Pilot School for Regulating SMRs (in-person, Warsaw, Poland, 25 August - 5 September 2025)

In response to growing interest in SMRs, particularly from embarking Member States, the IAEA aims to strengthen its support for regulatory frameworks development in countries considering SMR deployment.

Based on feedback received from embarking countries during the SMR RF educational workshops, the School for Regulating SMRs will further support Member States through capacity building for safe and secure deployment of SMRs and will expand beyond the programmatic content based on IAEA safety standards. The School's scope will also include detailed examples and in-depth case studies on how experienced regulatory bodies have adapted their regulations to SMRs and reviewed SMR designs.

The current proposal for the School for Regulating SMRs has no comparable international programme in terms of both technical and regulatory details. It will consist of three interconnected modules, each one lasting one week:

- Basic (basic SMR safety training), to improve knowledge on SMR safety characteristics and challenges. This module is particularly relevant to embarking countries with no background in nuclear power.
- Intermediate, to improve practical knowledge on case studies on:
  - application and adaptation of national regulatory frameworks to SMRs with focus on design review.
  - SMR regulatory reviews (review criteria and outcomes).
  - on-site specific issues.
- Advanced, to improve participants' practical knowledge on advanced licensing challenges for SMRs based on the SMR RF's work and especially its common positions.

The Pilot School will be held in Warsaw, Poland, from 25 August to 5 September 2025, and it will comprise intermediate and advanced modules.

Regulatory bodies' experts participating in the School will benefit from the exposure to the tools and detailed examples from experienced regulatory bodies dealing with SMRs, along with hands-on exercises. Furthermore, participants will be presented with common positions developed by the SMR RF Working Groups over the last three phases of its work (2014-2023), clarifying regulatory views on

SMR–related practices that may need to be re-evaluated. These materials will be supplemented by presentations on current SMR technologies and country-specific presentations by invited SMR RF experts. There will be ample opportunities for exchanging information and experiences between lecturers and participants, as well as among participants themselves.

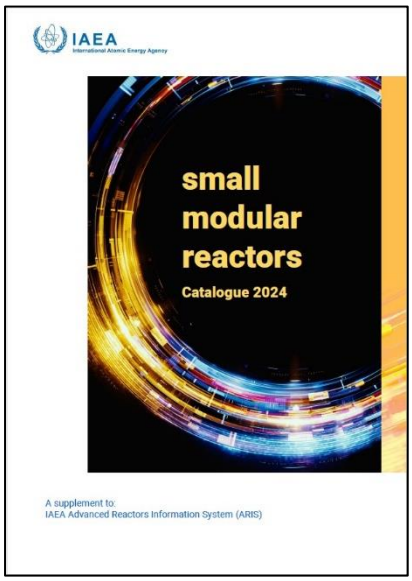
More details about the agenda, participation and registration will be available soon.

Other relevant IAEA Events on SMRs

- Joint IAEA-GIF Workshop on the Safety of Non-Water Cooled Reactors, Vienna, Austria, 30 June – 04 July 2025.
  - Nomination deadline: 28 March 2025
  - For more information please visit: https://www.iaea.org/events/evt2404397
- Technical Meeting on Safety Considerations in Non-Water Cooled Reactors Fuel and Core Design, Vienna, Austria, 25-29 August 2025.
  - Nomination deadline: 16 May 2025
  - For more information please visit: https://www.iaea.org/events/evt2404071
- Technical Meeting on Licensing of New Technologies and Regulatory Cooperation and Readiness Efforts, Vienna, Austria, 20-24 October 2025.
  - Nomination deadline: TBD
  - For more information please visit: TBD

Recent IAEA Safety Publications of Relevance

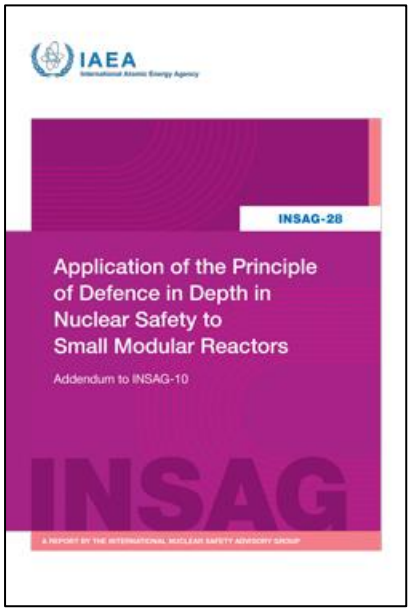
SMR Catalogue (2024)



A supplement to the IAEA Advanced Reactor Information System (ARIS). This catalogue presents Member States with a comprehensive yet concise overview of the advances on SMR Technology developments in 2024 and was released for the 1st International Conference on SMRs and their applications.

Click here for more information.

Application of the Principle of Defence in Depth in Nuclear Safety to Small Modular Reactors (INSAG Series No. 28, 2024)



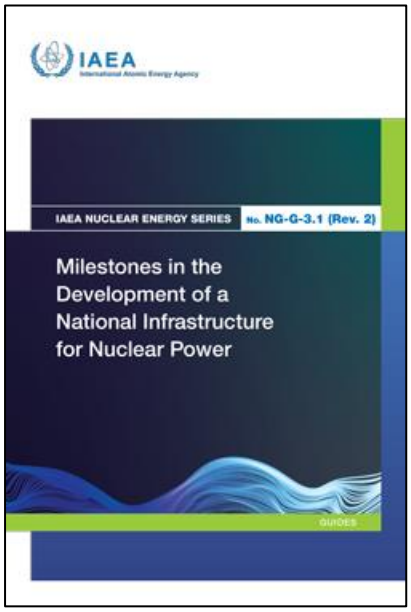
Supplements the International Nuclear Safety Advisory Group (INSAG) advice provided in INSAG-10.

Underscores application of the principle of defence in depth in nuclear safety for SMRs and related emerging technologies.

INSAG provides recommendations on current and emerging nuclear safety issues to the IAEA, the nuclear community, and the public.

Click **here** for more information.

Milestones in the Development of a National Infrastructure for Nuclear Power (IAEA Nuclear Energy Series No. NG-G-3.1 (Rev.2), 2024)



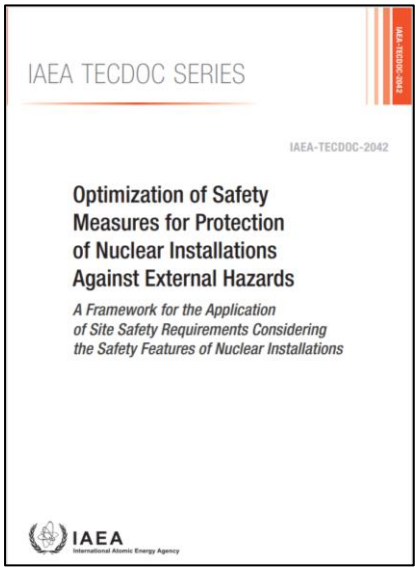
Defines three milestones in the development of the infrastructure necessary for introducing nuclear power and provides guidance on the activities that need to be carried out before each milestone.

Incorporates experiences and feedback from countries based on the last 19 Integrated Nuclear Infrastructure Reviews (INIRs) and several new IAEA publications on specific infrastructure issues since the first revision.

Included annex outlines the specific infrastructure considerations for SMRs, which are expected to be deployed in a number of countries in the coming years, such as integrated pressurized water reactors (PWRs) and high temperature gas cooled reactors (HTGRs).

Click **here** for more information.

Optimization of Safety Measures for Protection of Nuclear Installations Against External Hazards - A Framework for the Application of Site Safety Requirements Considering the Safety Features of Nuclear Installations (IAEA TECDOC Series No. 2042, 2024)



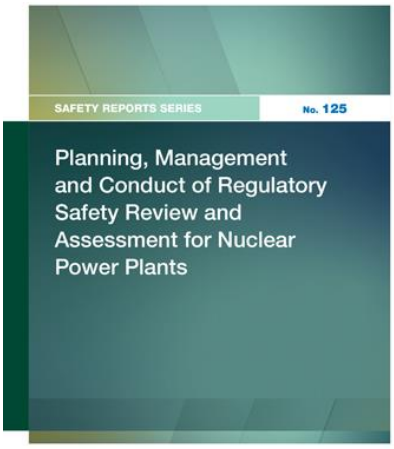
Provides practical guidance for the development of the technology-neutral safety framework for assessing the applicability of site evaluation requirements considering site-installation interactions and the innovative safety features of the advanced reactors, including SMRs.

Provides a methodology for an overall optimization of safety measures against external hazards, including the use of a risk-informed approach, supporting the effective and balanced implementation of the defence in depth concept and the application of grading.

Presents example of safety measures optimization during the design development of a non-light water SMR.

Click **here** for more information.

Planning, Management and Conduct of Regulatory Safety Review and Assessment for Nuclear Power Plants (Safety Reports Series No. 125, 2025)



Provides practical guidance for the planning, management and conduct of the review and assessment by regulatory bodies of applications for authorization.

Provides information on establishing a well defined, well organized and clear regulatory review and assessment process for the safety of nuclear power plants at different licensing steps.

Click **here** for more information.

For more information on the IAEA activities and publications related to the development, early deployment, and oversight of SMRs and their applications, please visit the IAEA Platform on Small Modular Reactors and their Applications (SMR Platform).

Relevant IAEA publications planned for publication in 2025:

- Handbook entitled "Handbook for Site Survey and Site Evaluation for Nuclear Installations";
- Safety Report entitled "Application of Graded Approach for Site Evaluation of Nuclear Installations including Small Modular Reactors"; and
- TECDOC entitled "Siting and Design Aspects of SMRs in Relation to External Hazards: Special Issues in the Application of Safety Standards (on Seismic Isolation, Steel Plated Structures and EPZ)".

Additionally, the TECDOC "Collaborative Reviews and Effective Leveraging", developed by the NHSI RT WG 3 during Phase I, has completed its internal review. The next step is submission to the IAEA Publications Committee (PC) for approval.

Two other TECDOCs, also developed by NHSI RT WGs, are currently undergoing IAEA editorial review and are expected to be published in 2025. These reports cover, respectively, a framework for sharing information among regulatory bodies (RBs) during reviews and a process for a multinational pre-licensing joint review.

Subscribe **here** to the IAEA Nuclear Safety and Security Publications Alert.

SMR RF Members' News and Events

Canadian Nuclear Safety Commission (CNSC) News

Ontario Power Generation (OPG)'s Darlington New Nuclear Project (DNNP)
The CNSC concluded the second part of a two-part public hearing in January 2025 for the license to construct a General Electric Hitachi (GEH) BWRX-300 reactor at the existing Darlington nuclear generating site. The Commission focused on staff and proponent technical assessments in the first part of the hearing and on interventions from Indigenous Nations and communities, the public and other interested parties in the second part.

This two-part hearing followed a one-part hearing in January 2024, which considered the applicability of the environmental assessment (EA) for the selected technology at the DNNP site. In April 2024, the CNSC published a decision confirming the applicability of the EA.

More information regarding the upcoming hearings and the DNNP project can be found here.

Bruce C Nuclear Project
Bruce Power is proposing the site preparation, construction, operation and decommissioning of a new nuclear generating station within its existing nuclear power site in the Municipality of Kincardine, Ontario. As proposed, the Bruce C Nuclear Project would provide up to 4,800 MWe of new nuclear generating capacity in Ontario. Several nuclear reactor technologies are being considered for the project. The project assessment is being conducted in collaboration with the Impact Assessment Agency of Canada.

Radiation and Nuclear Safety Authority in Finland (STUK) News

Fortum New Builds
Fortum requested pre-licensing reviews of selected issues of several designs, including:

- Westinghouse AP1000;
- Korea Hydro Nuclear Power (KHNP) APR1400+;
- EDF EPR;
- GEH BWRX-300;
- NUWARD SMR.

Steady Energy SMR
The conceptual design review of the SMR LDR-50 district heating reactor was requested by Steady Energy from STUK at the end of August 2024. The materials provided for assessment include conceptual design basis, safety concept, plant layout, and management system development. The review began in September 2024 and is expected to be completed in 2025. The review report will be in English and will incorporate recommendations from the NHSI RT WG3.

With the goal of having the first LDR-50 unit operational by 2030, Steady Energy plans to begin construction of a pilot plant in 2025. This plant will serve as a full-scale operational model of the reactor unit but will use an electric heater instead of nuclear fuel.

French Authority for Nuclear Safety and Radiation Protection (ASNR) News

CAL30 project
After having the maturity of the CAL30 conceptual design validated through the successful completion of the preparatory review (early review), Calogena submitted the safety option file (DOS) to Nuclear Safety Authority (ASN) in October 2024. This submission launches the pre-licensing phase of this 30 MWth district heating reactor.

LFR-30 SMR
A series of early review meetings related to the 30 MWe lead-cooled fast reactor (LFR 30 or LFR-AS-30) was held in 2024. In addition to these meetings, a range of preparatory documents covering various technical topics was developed. During this preparatory stage, ASN and the Institute for Radiological Protection and Nuclear Safety (IRSN) assessed the maturity of Newcleo's design and discussed all safety options for its LFR reactor and the associated nuclear fuel manufacturing plant. Newcleo is now preparing to submit official technical options for the LFR and fuel plant licensing. Following these developments, Newcleo plans to construct a first-of-its-kind 200 MWe commercial unit (the LFR-AS-200) in the UK.

For more information on the SMR projects in France, please visit https://french-nuclear-safety.fr/inspections/small-modular-reactors/smr-projects.

Creation of the Nuclear Safety and Radiation Protection Authority (ASNR)
Created by the merger of the ASN and the IRSN, the ASNR came into operation on 1 January 2025 as an independent administrative authority, overseeing civil nuclear activities in France on behalf of the State, and carrying out research, expert appraisal, training and public information missions in the fields of nuclear safety and radiation protection.

Korea Institute of Nuclear Safety (KINS) News

SMART100 SMR
The standard design approval (SDA) for SMART100 (System-integrated Modular Advanced ReacTor 100), which features fully passive safety systems and an integral type, was issued on 26 September 2024 by South Korea's Nuclear Safety and Security Commission (NSSC). The SDA was carried out in three steps: pre-licensing review and safety review by KINS, and approval by NSSC.

i-SMR
The pre-licensing review for the i-SMR (Innovative SMR), a 170 MWe (per module) integrated pressurized water reactor, is underway. The i-SMR Technology Development Project Team is leading technology development and plans to apply for SDA in 2026. Thirteen technical reports (TRs) for the i-SMR pre-licensing review have been submitted sequentially since 31 October 2023. KINS has reviewed the TRs and published safety evaluation reports (SERs) with regulatory positions. Additional TRs are expected to be submitted soon. KINS is also developing Safety Review Guides for the i-SMR, with expected completion by 2025.

Dutch Authority for Nuclear Safety and Radiation Protection (ANVS) News

THORIZON molten salt reactor (MSR)
Thorizon One, a 250MWth or 100MWe MSR is designed to provide electricity for households or industrial heat. Through the Memorandum of Understanding (MoU) between the ASN and the Authority for Nuclear Safety and Radiation Protection (ANVS), signed in September 2023, both French and Dutch safety authorities are collaborating on a preparatory review of Thorizon One to streamline the pre-license applications. This preparatory review is in progress including a series of joint technical meetings started in Autumn 2024 and expected to be finalized in 2025.

Dutch SMR for maritime fleet (floating/propulsion)
Considered nuclear as one of five roads to decarbonize commercial fleet, a consortium comprised of Dutch nuclear energy development and the consultancy company ULC-Energy BV was formed to study and design solutions for the commercial maritime sector using SMRs.

The UK Office for Nuclear Regulation (ONR) News

Great British Nuclear (GBN)
As part of the British Energy Security Strategy to achieve 24GWe of new nuclear capacity by 2050, Great British Nuclear launched in 2023 a competitive procurement to select the best SMR technologies. Currently, 4 companies remain in the competition: Rolls-Royce SMR, Holtec 300 SMR, Westinghouse AP300, and GE Hitachi BWRX300.

Additionally, GBN on behalf of the UK Government reviewed potential sites for SMR technologies and purchased two new sites from GE-Hitachi: Wylfa site in North Wales on Anglesey and the Oldbury site in England.

Rolls-Royce SMR Generic Design Assessment (GDA)
Rolls-Royce (RR) SMR entered the GDA in 2022. GDA Step 1 was completed in 2023, and Step 2 was completed in July 2024. Step 3 which is a detailed assessment of the SMR design started on 31 July 2024 and is expected to complete by December 2026.

For more information on RR SMR GDA, please visit https://www.onr.org.uk/generic-design-assessment/assessment-of-reactors/rolls-royce-smr/.

Holtec SMR GDA
Holtec International has begun the GDA of the SMR-300 in November 2023. SMR-300 is a pressurised water reactor (PWR) which can generate 300 megawatts of electricity. The design has completed Step 1 of GDA (called 'initiation') and has now entered Step 2, with expected completion by the end of 2025. Holtec is currently committed only to the completion of Step 2.

GE Hitachi BWRX 300 GDA
GE Hitachi BWRX 300 entered the GDA process in December 2023. BWRX-300 is a 300MWe water-cooled, natural circulation SMR, with passive safety systems adapted from the US-licenced ESBWR. The BWRX-300 has completed the first step of GDA, and GEH is currently planning to complete the GDA process through Step 2 by December 2025.

Westinghouse AP300 GDA
Westinghouse AP300 applied for GDA in early 2024 and has been cleared to initiate the GDA process. AP300 SMR design utilizes Westinghouse's Gen III+ advanced/AP1000 technology, which already has regulatory approval in Great Britain, the U.S. and China.

ONR/Environment Agency (EA) Early Engagement Process
In response to industry demand for engagement with regulators prior to entering GDA, Nuclear Site Licensing (NSL) and permitting, ONR and the EA launched an Early Engagement Process which is open to both Vendors and Prospective Licensees and aims to explain the regulatory processes required for deployment of a new nuclear fission reactor in GB and the options for navigating these processes. It also provides an opportunity for vendors and developers to introduce their designs to regulators and explain their proposed schedules and plans – and test these against regulatory expectations.

Early Engagement is in progress with the following Vendors/Prospective Licensees:

Applicant	Technology	Technology Type
Last Energy	PWR-20	20 MWe pressurised water reactor
Moltexflex	FLEX	60 MWth molten salt reactor
Newcleo	LFR-AS-200	200 MWe pool-type lead fast reactor
TerraPower	Natrium	345 MWe pool-type sodium fast reactor

Other vendors have expressed an interest in entering Early Engagement such as:

- X Energy (Xe-100 SMR)
- Cwmni Engino

For further information on the ONR/EA early engagement process, please visit: https://www.onr.org.uk/generic-design-assessment/early-regulatory-engagement-on-new-nuclear-projects/.

The U.S. Nuclear Regulatory Commission (U.S. NRC) News

The U.S. NRC's 37th Annual Regulatory Information Conference (RIC) (USA, 11-13 March 2025).

The RIC offers an open environment in which diverse groups of stakeholders may learn, share, and discuss information on significant and timely nuclear regulatory activities and emergent issues.

For additional information, please visit the RIC's website at https://www.nrc.gov/public-involve/conference-symposia/ric/index.html.

ADVANCE Act

The ADVANCE (Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy) Act of 2024 was signed by the US President in July 2024. It requires the NRC to take a number of actions, particularly in the areas of licensing of new reactors and fuels, while maintaining the NRC's core mission to protect public health and safety. NRC stood up an ADVANCE Act Core Team to coordinate implementation efforts.

For further information on the progress and activities related to the Act, please visit https://www.nrc.gov/about-nrc/governing-laws/advance-act.html.

Part 53 Rule Package

The regulatory requirements developed in this Part 53 rule package would use methods of evaluation, including risk-informed and performance-based methods, that are flexible and practicable for application to a variety of advanced reactor technologies. The US NRC engaged the public during the pre-rulemaking rule stage through meetings with stakeholders; preliminary proposed rule language; extension of draft proposed rule; specific requests for comment, and public meetings. A multi-day public meeting is planned to answer questions on the proposed rule after the 60-day public comment period ends. The NRC staff expects to issue the final Part 53 rule package by July 2025.

For further information, please visit the NRC's Rulemaking website on https://www.regulations.gov/docket/NRC-2019-0062.

Generic Environmental Impact Statement (GEIS) for Licensing of New Nuclear Reactors

In October 2024, the U.S. NRC issued a Notice of Availability for proposed amendment to the 10 CFR Part 51 and a draft GEIS for Licensing of New Nuclear Reactors for public comment. Both the proposed rule and the GEIS are expected to streamline the environmental reviews for future nuclear reactor applicants and to use a more technology-neutral framework. The US NRC is also issuing for public comment draft regulatory guide (RG), "Preparation of Environmental Reports for Nuclear Power Stations," and "Environmental Considerations Associated with New Nuclear Reactor Applications that Reference the Generic Environmental Impact Statement."

Please click here to access the presentation on the new reactor GEIS delivered at the public meeting on November 2024.

For further information on this topic, please visit the website at https://www.federalregister.gov/documents/2024/10/04/2024-22385/generic-environmental-impact-statement-for-licensing-of-new-nuclear-reactors.

Proposed Rule 10 CFR Part 73 - Alternative Physical Security Requirements for Advanced Reactors

This rule would amend physical security requirements for SMRs and other advanced reactor technologies. This rulemaking would establish voluntary alternative physical security requirements commensurate with the potential consequences to public health and safety and the common defence and security. The US NRC is currently evaluating public comments and expects to have the final rule approved by the end of 2025.

For further information, please visit https://www.regulations.gov/docket/NRC-2017-0227.

Proposed Rule 10 CFR Part 30 - Regulatory Framework for Fusion Machines

This limited-scope rulemaking would establish regulatory framework requirements for fusion systems that are technology inclusive and supportive of a performance-based approach to regulation. The proposed rule and draft guidance were sent to Commission in September 2024.

Please visit https://www.regulations.gov/docket/NRC-2023-0071 for more information.

The U.S. NRC Regulatory and Licensing activities

The status of new and advanced reactor applications under review by the U.S. NRC is listed below:

- Construction permit safety and environmental reviews for the advanced test reactor Hermes 2 was completed by NRC on 21 November 2024. For more information on the Kairos application, please visit https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes2-kairos.html.
- In September 2024, the U.S. NRC issued a Construction Permit to Abilene Christian University (ACU) for its 1 MW molten salt research reactor (MSRR) facility at the Nuclear Energy Experimental Testing Laboratory (NEXT Lab). For more information on the ACU's MSRR application, please visit https://www.nrc.gov/reactors/non-power/new-facility-licensing/msrr-acu.html.
- NuScale Standard Design Approval (SDA) review for the NuScale US460 (6 x 77 MWe) design is ongoing. Phase A (advanced safety evaluation report without open items) was completed in November 2024. The Final Safety Evaluation Report (FSER) and Standard Design Approval (SDA) are expected to be completed by July 2025. For more information on NuScale US460 application, please visit https://www.nrc.gov/reactors/new-reactors/smr/licensing-activities/current-licensing-reviews/nuscale-us460.html.
- TerraPower Construction Permit Application was accepted in May 2024 for the Natrium reactor of the Kemmerer Power Station Unit 1 (Kemmerer Unit 1). Safety and environmental reviews are expected to be completed in 2026. The Natrium reactor is a 345 MWe pool type sodium fast reactor (SFR) using high assay low enriched uranium (HALEU) metal fuel that will be used to demonstrate the TerraPower and GE-Hitachi Natrium SFR technologies. For additional information, please visit https://www.nrc.gov/reactors/new-reactors/advanced/who-were-working-with/applicant-projects/terrapower.html.

New applications that are expected in 2025:

- Tennessee Valley Authority – Construction Permit for BWRX300 SMR at Clinch River Nuclear Site;
- Duke Energy – Early Site Permit at Belews Creek, North Carolina;
- Abilene Christian University – Operating License for molten salt research reactor.

The US NRC is currently engaging with over 20 potential applicants for SMR licensing activities.

For more information on licensing activities for SMRs, please visit the USNRC's New Reactors website.

Publications recently approved by the U.S. NRC

Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications — Roadmap

This Interim Staff Guidance (ISG) was published in March 2024. The guidance in this ISG provides a general overview of the information that should be included in a non-LWR application submitted under 10 CFR Part 50 or 10 CFR Part 52; a review roadmap for NRC staff with the principal purpose of ensuring consistency, quality, and uniformity of staff reviews; and a well-defined base from which the staff can evaluate proposed differences in the scope of reviews (e.g., Construction Permit versus Operating License). Please click here to download it.

White Paper on Nth-of-a-kind Micro Reactor Licensing and Deployment Considerations

This Preliminary White Paper was issued by the US NRC in September 2024. This paper was released to support upcoming interactions with the Advisory Committee on Reactor Safeguards (ACRS) on the U.S. Nuclear Regulatory Commission (NRC) staff's strategy for efficient licensing of "nth-of-a-kind" (NOAK) micro-reactors, including options for NRC staff review of standardized operational programs in connection with review of a standard design and options for alternative environmental reviews associated with combined license (COL) and construction permit (CP) and subsequent operating license (OL) applications for NOAK microreactors. Please click here to download it. The presentation delivered at the public meeting in November 2024 can be accessed here.

Behind the Scenes: Interview with the SMR RF Chair, Mr Samuel Lee

In this interview, the SMR RF Chair discusses his professional background, involvement with the SMR RF, the importance of the Forum, and personal interests.

How long have you been with the U.S. NRC, and what responsibilities have you held over the years? What has been the most rewarding aspect of your job so far?

I have been with the NRC for 33 years, starting as a reactor systems engineer, then working as a reliability and risk analyst in licensing, inspection oversight, and rulemaking. I also had the privilege of serving as a technical assistant to former NRC Chairman, Dr. Dale Klein, advising him on policy matters related to regulating operating reactors and new reactor licensing.

I then spent several years conducting new reactor licensing reviews as a manager in technical and project management branches, including serving as an international assignee to the Korea Institute of Nuclear Safety. After several years as a manager in security oversight, I assumed my current role as deputy director of the division responsible for the re-licensing of operating reactors and the licensing of new light water reactor technologies, both small and large.

The most rewarding aspect of my job has been the opportunity to contribute directly to the NRC's mission of protecting public health, safety, and security in the civilian use of nuclear technology. It has been an immense privilege to be involved in licensing new reactor technologies and supporting the safe deployment of nuclear energy through efficient and reliable licensing.

How long have you been involved with the SMR RF, and in what capacity?

During the early years of SMR RF, for about three years, I served as a member of the Licensing Working Group while leading the NRC's review of the NuScale US720 DCA. I have recently re-joined the SMR RF as the Chairperson.

In your view, what has been the biggest impact of the Forum thus far? In your position as the new Chairperson, what do you think the priorities for the next Phase of Forum's work (in 2026-2028) should be?

The Forum has made tremendous progress in developing common positions in three areas: licensing; design safety analysis; and manufacturing, construction, commissioning and operation. In the coming years, I look forward to the Forum further contributing to the international effort to harmonize SMR-related regulatory requirements as part of the IAEA's Nuclear Harmonization and Standardization Initiative (NHSI). I believe that over the next decade, the Forum will continue to grow in both membership and significance, benefitting regulatory bodies and other stakeholders worldwide.

How would you describe yourself outside of work? What activities do you enjoy, and what are your personal interests or hobbies?

I am blessed to have a family who loves and puts up with me. My wife and I enjoy attending our son's track and cross-country meets. I also enjoy exploring local coffee shops with my college-aged daughter when she is on break from school. My favourite way to unwind is to ride anything on two wheels.

Mr Samuel Lee
SMR RF Chairperson
Deputy Director of the Division of New & Renewed Licenses
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission (U.S. NRC)