IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Interregional Training Course on Advances in Microreactor Designs and Applications: Scalability and the potential for remote deployment, marine and space applications

Hosted by

The Government of the Russian Federation

through the

Rosatom Technical Academy

Russian Federation

21 to 25 September 2026

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Information Sheet

Purpose

The purpose of the event is to strengthen the capacity of Member States to understand and engage with the rapidly developing field of nuclear microreactor technology, as a subset of small modular reactors (SMRs). The course will provide an integrated view of how microreactor concepts are designed, engineered, and evaluated, with emphasis on the specific attributes of technology that distinguish them from other reactor classes.

The training will explore the design philosophies guiding microreactor development and examine how surrounding disciplines, such as the reactor, systems, fuel cycle, nuclear safety, nuclear security, safeguards, materials science, economics, and regulatory frameworks, shape the evolution and deployment-readiness of microreactors.

Through these discussions, the training will support Member States in forming informed perspectives on the potential contributions of microreactors to national energy strategies that involve considerations of deployments in remote regions, distributed arrangement, and specialized applications where typical SMRs or larger nuclear power plants may not be viable.

Working Language

The event will be conducted in **English.**

Deadline for Nominations

Nominations received after **12 August 2026** will not be considered.

Project Background

Small Modular Reactors (SMRs) are advanced nuclear reactors designed to generate electric power typically up to 300 MWe, for which their structures, systems and components can be fabricated in factories and transported to the sites for installation to shorten construction duration, thus reduce cost. The clean energy strategy advocates for the deployment of advanced nuclear reactors as a safe, reliable, flexible and competitive power source. SMRs of different types of technology are a promising option for near-term and future deployment in Member States, along with their various applications. The purpose of the project is to provide broad support to build Member States capacities in the development and deployment of SMRs in the context of clean energy strategy, as a contribution of nuclear power to the global effort for climate change mitigation.

The project will provide a wide range of forum to enable effective capacity building through training and technology transfer on all aspects of SMR development, including siting, design; technology; engineering, manufacturing, construction, industrial supply chain, commissioning, operation, maintenance, human resource management; fuel cycle; waste management; decommissioning; economics; financing; energy sustainability, nuclear safety, security and safeguards; emergency preparedness and response arrangements; and legal framework. The project will also cover the emerging microreactors, as a subset of SMRs having power typically up to 50 MWt as well as deployment of SMRs for non-electric applications, including cogeneration of electricity and process heat, nuclear desalination, nuclear hydrogen generation, maritime applications, and nuclear power system for outer space applications.

The coupling of advanced nuclear power systems using SMRs in integrated or hybrid energy systems with higher share of renewables will also be covered. The project will enable stakeholders in national, regional and international levels to understand the potential benefits and challenges to overcome in deployment of SMRs given their specific characteristics. The project also will facilitate the formulation of high-level end-users recommendations and considerations for SMR designs and technologies, in line with international safety standards, and countries' specific legal and regulatory frameworks. The project will favour the sharing of end-users' specific needs and requirements also licensing practice and experience among participating countries.

Member States will receive technical assistance to evaluate the contribution of SMRs and their potential non-electric applications in addressing Sustainable Development Goals (SDGs) 6, 7, 9, 12 and 13, mitigating climate changes and integrating the basic principles of circular economy. Inputs will be sought from technology developers, as well as from the countries that are considering the deployment of SMRs.

This project's predecessor, i.e., the phase-1, INT2023 "Supporting Member States' Capacity Building on Small Modular Reactors and Micro-reactors and their Technology and Applications as a Contribution of Nuclear Power to the Mitigation of Climate Change," provided critical and effective capacity-building and knowledge-sharing amongst 62 Recipient Member States and 13 Donor Countries that are invited to attend as cost-free observers or experts in these thematic areas. From 2022 to the end of 2025, the project will have implemented 50 events (32 workshops, 14 training courses, 2 expert missions, 1 sponsored conference participation, and 1 group scientific visit) on the following topics: 3S (safety, security, and safeguards), technical and economic considerations, infrastructure development (policy and legal framework, human resource development, and knowledge management), and fuel cycle, decommissioning, waste, and overall management of SMR and MR deployment.

The results attained were positive in supporting Member States in receiving technical assistance in line with SDGs 6, 7, 9, 12 and 13, which is also aligned with number 5 out of the 19 Infrastructure Issues of the IAEA Milestones Approach to ensure the safe, secure, and peaceful use of SMRs. The 62 Recipient Member States that are on the INT2023 predecessor project have expressed interest in future SMR events under this new project.

Scope and Nature

The training will consist of expert presentations, technical discussions, and structured exchanges focused on the key elements of microreactor technology development. Rather than concentrating on individual designs, the course will examine the underlying considerations that influence how microreactors are conceived, developed, and prepared for deployment.
These considerations include the operational environments for which microreactors are intended; the functional attributes that drive their design, such as compactness, transportability, autonomous operation, and long operational lifetimes; and the engineering and programmatic decisions needed to realize these attributes.
The course will explore how microreactor development interacts with surrounding disciplines, including:

- the reactor and systems in the primary systems, turbine island and balance of plant
- the characteristics of long-life fuels and the associated fuel cycle implications;
- safety approaches adapted to small, inherently safe, or transportable systems;
- safeguards and security considerations for factory-fuelled or remotely operated units;
- project delivery, manufacturing, and supply-chain strategies unique to microreactors;
- economic and market factors shaping the viability of microreactor deployment; and
- policy and regulatory frameworks evolving to accommodate new operational concepts.

Throughout the course, participants will be encouraged to view microreactors as integrated socio-technical systems, where technology, infrastructure, regulation, supply chains, and user needs must be aligned. This structure mirrors the analytical framework of the accompanying technical report on microreactor technology development.

References:

- Small Modular Reactors Catalogue 2024, Third edition, IAEA, Vienna (2024)
- Small Modular Reactors: Advances in SMR Developments 2024, IAEA, Vienna (2024)
- Technology Roadmap for Small Modular Reactor Deployment, IAEA. Vienna (2021)
- Approaches to and Preparation for the Operation of Small Modular Reactors, IAEA, Vienna (2025)
- Fundamental Safety Principles, IAEA Safety Standards Series No. SF-1, IAEA, Vienna (2006)
- Preparedness and Response for a Nuclear or Radiological Emergency IAEA safety standards series No. GSR Part 7, Vienna (2015)
- Arrangements for Preparedness for a Nuclear or Radiological Emergency IAEA safety standards

series No. GS-G-2.1, Vienna (2007)
- Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency IAEA safety standards series No. GSG-2, Vienna (2011)
- Actions to Protect the Public in an Emergency due to Severe Conditions at a Light Water Reactor IAEA Emergency Preparedness and Response Series No. EPR-NPP Public Protective Actions, Vienna (2013)

Expected outputs

- Gain a clear understanding of the design principles and development pathways that define microreactor technologies.
- Recognize how operational missions and deployment environments influence microreactor design choices.
- Understand the specific ways in which fuel cycle and materials considerations, safety approaches, security and safeguards requirements, and regulatory expectations interact with microreactor development.
- Appreciate the economic, logistical, and industrial factors that influence microreactor deployment and commercialization.
- Identify the institutional, regulatory, and infrastructure-related capabilities needed to support microreactor programmes within their national contexts.
- Develop a system-level understanding of how microreactors may contribute to national energy goals, resilience strategies, and emerging applications, particularly in remote or specialized settings.

Participation

The event is open to up to 20 participants from the following Member States participating in the INT2025 project which need assistance to enhance the number and knowledge of staff involved in launching nuclear power programmes, namely:

Algeria, Argentina, Armenia (Republic of), Azerbaijan, Belgium, Bolivia, Brazil, Bulgaria, Cambodia, Canada, China, Croatia, Czech Republic, Denmark, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Ghana, Greece, Guatemala, Hungary, Indonesia, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea (Republic of), Kuwait, Kyrgyzstan, Latvia, Lithuania, Madagascar, Malaysia, Mexico, Mongolia, Morocco, Myanmar, Niger, Nigeria, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Russian Federation, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Thailand, Tunisia, Türkiye, Uganda, Ukraine, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States of America, Uzbekistan, Zambia.

Participants' Qualification and Experience

Participants should be mid-career professionals involved in reactor technology development, nuclear energy planning, regulation, research, or technical support functions relevant to advanced reactor systems.

Suitable nominees include:

- Technical experts and engineers engaged in design, safety assessment, fuel cycle analysis, system modelling, or materials development;
- Staff of regulatory bodies and technical support organizations reviewing or preparing to review innovative reactor technologies;

- Professionals in energy planning, infrastructure development, or industrial sectors evaluating non-traditional or remote nuclear applications;
- Researchers and analysts contributing to advanced reactor programmes, system integration studies, or deployment strategies.

The activities will be conducted in English and candidates should have sufficient English proficiency to participate in the training course without difficulty.

Candidates are requested to provide a summary of how this training will provide direct benefit to their current or future job position.

Individuals who participated in this course or a similar course in the past three years should not apply.

Application Procedure

Candidates wishing to apply for this event should follow the steps below:

1. Access the InTouch+ home page (https://intouchplus.iaea.org) using the candidate's existing Nucleus username and password. If the candidate is not a registered Nucleus user, she/he must create a Nucleus account (https://websso.iaea.org/IM/UserRegistrationPage.aspx) before proceeding with the event application process below.
2. On the InTouch + platform, the candidate must:
    a. Finalize or update her/his personal details, provide sufficient information to establish the required qualifications regarding education, language skills and work experience ('Profile' tab) and upload relevant supporting documents;
    b. Search for the relevant technical cooperation event (**EVT2506325**) under the 'My Eligible Events' tab, answer the mandatory questions and lastly submit the application to the required authority.

NOTE: Completed applications need to be approved by the relevant national authority, i.e. the National Liaison Office, and submitted to the IAEA through the established official channels by the provided designation deadline. **All nominations must include a scan of the candidate's first page of passport with photo.**

For additional support on how to apply for an event, please refer to the InTouch+ Help page. Any issues or queries related to InTouch+ can be addressed to InTouchPlus.Contact-Point@iaea.org.

Should online application submission not be possible, candidates may download the nomination form for the training course from the IAEA website.

NOTE: A medical certificate signed by a registered medical practitioner dated not more than four months prior to starting date of the event must be submitted by candidates when applying for a) events with a duration exceeding one month, and/or b) all candidates over the age of 65 regardless of the event duration.

Training on Basic Security in the Field (BSITF)

In order to comply with UN system-wide security measures, it is required that all training course participants complete the online security awareness training BSAFE (which replaces BSITF and ASITF), prior to traveling to locations where UN security phases are in effect. The aim of these course is to educate participants on how best to avoid or minimize potential dangers and threats, and to demonstrate what

individuals can do if they find themselves in insecure situations. The course is available online (https://training.dss.un.org/course/category/6).

Once an individual has completed the training, he/she must go back to the main training page to receive the certificate. If the button to get the certificate is not immediately visible, please refresh the page. BSAFE is maintained by UNDSS; in case of problems with the system, please contact UNDSS through the "Contact Us" page on the training website (https://dss.un.org/dssweb/contactus.aspx).

This certificate is compulsory for any IAEA-supported activity and should be submitted, along with the Nomination Form, through the competent authority in your country (NLO). Copies of the certificate should be kept by the candidate for his/her records as the BSAFE certificate does not expire.

Administrative and Financial Arrangements

Nominating authorities will be informed in due course of the names of the candidates who have been selected and will at that time be informed of the procedure to be followed with regard to administrative and financial matters.

Selected participants will receive an allowance from the IAEA sufficient to cover their costs of lodging, daily subsistence and miscellaneous expenses. They will also receive either a round-trip air ticket based on the most direct and economical route between the airport nearest their residence and the airport nearest the duty station through the IAEA's travel agency American Express, or a travel grant, or they will be reimbursed travel by car/bus/train in accordance with IAEA rules for non-staff travel.

NOTE: The event will be hosted in Saint Petersburg, Russian Federation therefore nominated participants who require a visa to enter the Russian Federation should submit the necessary application to the nearest diplomatic or consular representative of the Russian Federation as soon as possible.

Disclaimer of Liability

The organizers of the event do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in approving his/her participation, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

Note for female participants

Any woman engaged by the IAEA for work or training should notify the IAEA on becoming aware that she is pregnant.

The Board of Governors of the IAEA approved new International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Standards deal specifically with the occupational exposure conditions of female workers by requiring, inter alia, that a female worker should, on becoming aware that she is pregnant, notify her employer in order that her working conditions may be modified, if necessary. This notification shall not be considered a reason to exclude her from work; however, her working conditions, with respect to occupational exposure shall be adapted with a view to ensuring that her embryo or foetus be afforded the same broad level of protection as required for members of the public.

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