Interregional Training Course on safety aspects of Small Modular Reactors (SMRs)

Hosted by

International Atomic Energy Agency (IAEA)

Vienna, Austira

19 to 23 February 2024

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Information Sheet

Purpose

The purpose of the event is to train the participants to get an overview on the safety aspects of five SMRs and advanced reactor technology types, namely, water cooled small modular reactors (WC-SMRs), high-temperature gas reactors (HTGRs), sodium fast reactors (SFRs), lead fast reactors (LFRs), and molten salt reactors (MSRs).

Working Language

The working language of the event will be English.

Deadline for Nominations

Nominations received after December **10, 2023** will not be considered.

Project Background

To meet the growing demand for energy and to mitigate global climate change challenge, the interest in Small Modular Reactors (SMRs) and Micro-Reactors (MRs) is growing, especially in regions inaccessible to large electricity grids and regions with smaller electricity grids that need technology options deployed incrementally to closely match increasing energy demand. SMRs and MRs are also viable options for users with needs beyond electricity supply, e.g., district heating, desalination, industrial process heat, as well as hydrogen. The purpose of the project is to provide broad support to Member States in the development and deployment of SMRs and MRs. The project provides a broad range of fora to enable effective capacity building through training and technology transfer activities on all aspects of SMR development. The project also covers the emerging MRs, the development of SMRs for electric and non-electric applications, and the coupling of such nuclear systems with renewables in integrated energy systems. The aim of the project is to enable national stakeholders to gain enhanced understanding of key characteristics of SMR and MR technologies and their applications, and to formulate, in line with international safety standards, countries' specific legal and regulatory frameworks, and generic user requirements and criteria for SMR technologies.

Scope and Nature

During the five-days face to face event each reactor technology will be presented on one day.

To facilitate the discussion on the key safety aspects of each technology, the sessions will be dedicated to

- an introduction to the reactor technology, such as general plant description, operating history, nuclear core and fuel design, main plant systems, and main applications.
- safety aspects of presented technology, such as design characteristics important to safety, defence-in-depth, implementation of the fundamental safety functions (reactivity control, heat removal, confinement), typical potential accidents and how they are dealt with in the design, waste and spent fuel management, and decommissioning.

Furthermore, the event will include presentations, and peer-to-peer information exchange. An international expert in each SMR technology included in this course will present and share his/her knowledge and experience.

References

Accepted participants should read the following references to get the most out of the event:

- INTERNATIONAL ATOMIC ENERGY AGENCY, Small Modular Reactors: A New Nuclear Energy Paradigm
- INTERNATIONAL ATOMIC ENERGY AGENCY, Medium Term Strategy (2022-2029) for Agency Support to Member States in the area of SMRs and their Applications

- INTERNATIONAL ATOMIC ENERGY AGENCY, Advances in Small Modular Reactor Technology Developments — A Supplement to: IAEA Advanced Reactors Information System (ARIS) - 2022 Edition, IAEA, Vienna (2022)

- INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Technology Review 2022 - Report by the Director General, IAEA, Vienna (2022)

- INTERNATIONAL ATOMIC ENERGY AGENCY, Technology Roadmap for Small Modular Reactor Deployment, IAEA Nuclear Energy Series No. NR-T-1.18, IAEA, Vienna (2021)

- INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA Safety Standards, Specific Safety Requirements No SSR-2/1 (Rev. 1), Vienna (2016)

- INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Report (pre-print), Applicability of Safety Standards to Non-Water-Cooled Reactors and Small Modular Reactors, Vienna (2022)

- INTERNATIONAL ATOMIC ENERGY AGENCY, Technical Safety Review Service (Design Safety) & 21-04475e_tsr-ds_review_guidelines_draft2.pdf (iaea.org)

- INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA-TECDOC-2010, Approach and Methodology for the Development of Regulatory Safety Requirements for the Design of Advanced Nuclear Power Reactors, Vienna (2022)

- INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA-TECDOC-2003, Lessons learned in Regulating Small Modular Reactors, Vienna (2022)

- INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA-TECDOC-1936, Applicability of Design Safety Requirements to Small Modular Reactor Technologies Intended for Near Term Deployment, Vienna (2020)

Expected outputs

The expected outputs of the event are:

- Participants gained knowledge and became aware of the key aspects of the safety of different SMR technology types;
- Participants exchanged experience in discussions with peers and experts and advanced their knowledge relevant to the course topics.

Participation

The event is open to up to 35 participants from the following Member States participating in the TC Project INT2023:

Algeria, Argentina, Armenia, Belarus, Bolivia, Brazil, Bulgaria, China, Croatia, Czech Republic, Egypt, El Salvador, Estonia, Ethiopia, Georgia, Ghana, Greece, Guatemala, Hungary, Indonesia, Islamic Republic of Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Latvia, Libya, Lithuania, Madagascar, Malaysia, Mexico, Morocco, Myanmar, Namibia, Nigeria, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Rwanda, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Sri Lanka, Sudan, Thailand, Tunisia, Türkiye, United Republic of Tanzania, Uzbekistan, Zambia.

At no cost to the IAEA, participants from following countries can also be considered:

Australia, Canada, France, Italy, Japan, Belgium, Denmark, Spain, Finland, India, Republic of Korea, Russian Federation, United Kingdom, United States of America.

Participants' Qualification and Experience

This event is designed for participants from newcomer countries who have a keen interest in deploying Small Modular Reactors (SMRs) for their initial nuclear project. The target audience of this event are those individuals working in Member States' governments, regulatory bodies, technical support organizations, or prospective owner/operator organizations and SMR developers, particularly those needing to understand the key issues and challenges associated with safety consideration for SMRs.

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

The event will be conducted in English, and it is expected that candidates possess a sufficient level of English proficiency to actively engage in the event without encountering any language-related difficulties.

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. Download and complete the Designation of Beneficiary and Emergency Contact Form, and upload to InTouch+ ('Profile' tab under the personal section) specifying the document name. If already provided, kindly discard this step;
    c. Search for the relevant technical cooperation event (EVT2207326) 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 event 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.

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.

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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