



# **Interregional Workshop on Basic Principles of Circular Economy to Close the Lifecycle of SMRs**

**Hosted by**

The Government of the Russian Federation

**through the**

State Atomic Energy Corporation 'Rosatom'

St. Petersburg, Russian Federation

**4 to 8 November 2024**

**Ref. No.:** ME-INT2023-2400886

## **Information Sheet**

### **Purpose**

The purpose of the event is to discuss and share experiences on the integration of circular economy principles into the lifecycle of Small Modular Reactors (SMRs), with a particular focus on back-end processes such as spent fuel management, decommissioning, and waste management.

### **Working Language**

The training course will be conducted in English.

### **Deadline for Nominations**

Nominations received after 14 September 2024 will not be considered.

## Project Background

Small Modular Reactors (SMRs) are advanced nuclear reactors designed to generate electric power typically up to 300 MWe, whose structures, systems and components can be fabricated in factories and transported to installation sites based on demand. Modularization enables the economics of serial production, shorter construction schedules, and lower capital cost. The purpose of the project is to provide broad support to Member States in the deployment of SMRs and MRs. The INT2023 TC project (**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**) provides a forum to enable effective capacity building through training and technology transfer activities on all aspects of SMR and MR development, including siting, design; technology; engineering, construction, commissioning, operation, maintenance, human resource management; fuel cycle; waste management; decommissioning; economics, financing; nuclear safety and security; emergency preparedness and response arrangements; and legal framework. The aim of the project is to enable national stakeholders to understand 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. Member States are receiving technical assistance to evaluate the contribution of SMRs, MRs and their potential non-electric applications in addressing UN Sustainable Development Goals (SDGs) 6, 7, 9, 12 and 13, mitigating climate changes and integrating the basic principles of circular economy.

The global drive towards sustainable energy solutions has highlighted the importance of integrating circular economy principles into the lifecycle of energy technologies. Small Modular Reactors (SMRs) offer a promising technology for low-carbon energy generation due to their scalability and potential for cost-effective deployment. However, to fully realize their sustainability potential, it is crucial to address the entire lifecycle of SMRs, with particular attention to the back end, which includes spent fuel management, decommissioning, and waste management.

The concept of a circular economy emphasizes the importance of reducing waste, reusing materials, and recycling resources to create a closed-loop system that minimizes environmental impact. For SMRs, implementing these principles at the back end can significantly mitigate the challenges associated with radioactive waste and resource consumption.

## Scope and Nature

The workshop on the circular economy for the lifecycle of Small Modular Reactors (SMRs) will explore how to integrate sustainable practices into the back-end stages of spent fuel management, decommissioning, and waste management. Participants will gain an understanding of circular economy principles, including waste minimization, resource efficiency, and material reuse and recycling, and how these can be applied to the nuclear energy sector. The workshop will identify opportunities and decision points for maximizing sustainability throughout the SMR lifecycle, from design to end-of-life management.

Key challenges in spent fuel management will be addressed, highlighting opportunities in recycling and reprocessing technologies that can reduce waste volumes and recover materials with potential value. Strategies for safe and efficient decommissioning of SMRs, including decommissioning by design, will be discussed, emphasizing waste prevention, material recovery and recycling. The workshop will also cover technologies for minimizing nuclear waste and recovering resources, alongside the regulatory and policy frameworks needed to support these practices.

The workshop will take the form of presentations, interactive discussions and examination of case studies that will cover the following topics:

- Circular economy principles
- Policy and strategies for spent fuel and radioactive waste management;
- Regulatory frameworks;
- Spent fuel management;
- Decommissioning of SMRs including the concept of “decommissioning by design”;
- Application of waste hierarchy principles: prevention, minimization, recycle, reuse; and
- Innovations and future technological advances.

## Expected outputs

The expected output of the event is to strengthen knowledge and understanding in the following areas:

- Enhanced understanding of circular economy principles and their relevance to SMRs;
- Identification of key challenges and opportunities in the back-end processes of SMRs; and
- Development of practical strategies for waste minimization, material recovery, and resource recycling.

## Participation

The event is open to up to 20 participants from the following Member States participating in the TC Project INT/2/023:

Algeria, Argentina, Armenia, Belarus, Bolivia, Brazil, Bulgaria, China, Croatia, Czech Republic, Egypt, El Salvador, Estonia, Ethiopia, Ghana, Greece, Guatemala, Hungary, Indonesia, Islamic Republic of Iran, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Latvia, Libya, Lithuania, Malaysia, Mexico, Morocco, Myanmar, Nigeria, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Rwanda, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Sri Lanka, Thailand, Tunisia, Türkiye, United Republic of Tanzania, Uzbekistan, Zambia. **The selected participants to attend will be funded through INT2023.**

Australia, Canada, Czech Republic, France, Italy, Japan, Belgium, Denmark, Spain, China, Finland, India, Republic of Korea, South Africa, Russian Federation, United Kingdom, United States of America. **The participants to attend will be cost free to IAEA.**

**The selected participants can attend this course virtually in a case if is unable to attend in face to face due to travel restriction and or other reason.**

## Participants' Qualification and Experience

Participants should have a working understanding of the principles of radioactive waste management and be able to integrate the information and knowledge gained from this workshop into their Member State's future nuclear power and small modular reactor programs, with a focus on sustainability aspects.

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

## 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 (EVT2400886) 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](mailto: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.

## **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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