



*Atoms for Peace and Development*

الوكالة الدولية للطاقة الذرية

国际原子能机构

International Atomic Energy Agency

Agence internationale de l'énergie atomique

Международное агентство по атомной энергии

Organismo Internacional de Energía Atómica

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In reply please refer to: **EVT2105850**

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The Secretariat of the International Atomic Energy Agency (IAEA) presents its compliments to the IAEA's Member States and has the honour to draw their attention to the **Technical Meeting on Back End of the Fuel Cycle Considerations for Small Modular Reactors** (hereinafter referred to as "event") to be held at the IAEA's Headquarters in Vienna, Austria, from **20 to 23 September 2022**.

In addition, the event will allow for virtual participation via Cisco Webex.

The purpose of the event is to share technical information on the management of spent nuclear fuel from the operation of small modular reactors and to anticipate related opportunities and challenges.

The attached Information Sheet provides further details of the event.

The event will be held in English.

Member States are invited to designate one or more participants to represent the Government at this event. Member States are strongly encouraged to identify suitable women participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event. The application for financial support should be made at the time of designating the participant(s) using the attached Grant Application Form (Form C).

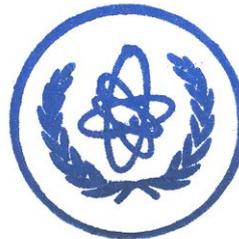
It should be noted that compensation is not payable by the IAEA for any damage to or loss of personal property. The IAEA also does not provide health insurance coverage for participants in IAEA events. Arrangements for private insurance coverage on an individual basis should therefore be made. The IAEA will, however, provide insurance coverage for accidents and illnesses that clearly result from any work performed for the IAEA.

Designations should be submitted to the IAEA through the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) not later than **27 July 2022** using the attached Participation Form (Form A). Completed and authorized Participation Forms should be sent either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Copies should be sent by email to the Scientific Secretary of the event, Ms Amparo González-Espartero, Division of Nuclear Fuel Cycle and Waste Technology, Department of Nuclear Energy (Email: [A.G.Espartero@iaea.org](mailto:A.G.Espartero@iaea.org)). The Scientific Secretary of the event will liaise with the participants directly concerning further arrangements, including travel details, as appropriate, once the official designations have been received.

Should Governments wish, in addition, to appoint one or more observers to assist and advise the designated participants, they are kindly requested to inform the IAEA of the names and contact details of any such observers by the above date. In accordance with the established rules, Governments are expected to bear the cost of attendance of any observers they may send to IAEA events. Compensation is not payable by the IAEA for any damage to or loss of observers' personal property or for illness, injury or death occurring while travelling to or in connection with their attendance at IAEA events.

The IAEA takes no responsibility for, and the provider of the virtual meeting services has represented and warranted that the Services shall not contain, and that no end user shall receive from the software used to hold the virtual meeting, any virus, worm, trap door, back door, timer, clock, counter or other limiting routine, instruction or design, or other malicious, illicit or similar unrequested code, including surveillance software or routines which may, or is designed to, permit access by any person, or on its own, to erase, or otherwise harm or modify any data or any system, server, facility or other infrastructure of any end user (collectively, a "Disabling Code").

The Secretariat of the International Atomic Energy Agency avails itself of this opportunity to renew to the IAEA's Member States the assurances of its highest consideration.



2022-07-05

Enclosures: Information Sheet

Participation Form (Form A)

Form for Submission of a Paper (Form B)

Grant Application Form (Form C)



**IAEA**

International Atomic Energy Agency

*Atoms for Peace and Development*

# **Technical Meeting on Back End of the Fuel Cycle Considerations for Small Modular Reactors**

**IAEA Headquarters, Vienna, Austria**  
and virtual participation via Cisco Webex

**20–23 September 2022**

**Ref. No.: EVT2105850**

## **Information Sheet**

### **Introduction**

There is an increasing interest in small modular reactors (SMRs) and their applications, in part due to their consideration as a low carbon energy source in the climate change mitigation plans of many Member States. SMRs are newer generation reactors designed to generate electric power typically up to 300 MWe. According to the IAEA SMR Booklet (2020), there are 72 SMR concepts currently under development, spanning a significant range of reactor technologies. The SMR concepts can be deployed in a variety of configurations, ranging from single-unit installations to multimodule plants with a differing degree of modularisation across designs to suit the requirements of the operator.

SMR concepts vary from evolutionary variants of light water reactors (LWR-SMRs, either land or marine based), that benefit from many decades of operating experience; high temperature gas cooled reactors (HTGRs); liquid metal fast reactors (LMFRs) and molten salt reactors (MSRs). SMR designs use a variety of coolants (water, liquid metal, molten salts) and fuel forms (oxide/ceramic, metal, TRISO, liquid fuel salts, etc) having different technology readiness levels (TRLs) and fuel compositions (UO<sub>x</sub> (LEU, HALEU); Mixed U and Pu (oxide, metal, or salt); kernel particles; ...).

While much focus has been given to aspects of SMR deployment such as reactor concepts, engineering, economics, infrastructure, safety and so on, the fuel cycle, and in particular the management of spent fuel, appears to have had limited consideration. As the SMR concepts are becoming more refined, it is an appropriate time to start identifying the challenges, opportunities, and issues for managing spent fuel from SMRs during storage, transportation, reprocessing & recycling, and disposal.

The implications for the backend of the fuel cycle are very dependent on the characteristics of the nuclear fuel to be managed as spent (e.g., enrichment, matrices and compositions) and its irradiation history (e.g., burnup).

These parameters impact the different stages of spent fuel management that are currently implemented, designed and licensed for the spent fuel arising from the current fleet of NPPs. Accommodating different spent fuels coming from SMRs will require adaptation at all stages of the backend of the fuel cycle due to higher thermal outputs, higher criticality risks, different radionuclide inventories, new matrices and cladding behaviours, etc. implying the need of R&D and demonstrations to ensure that the main safety objective is met.

The IAEA is organizing a Technical Meeting from 20 to 23 September 2022 to facilitate the exchange of information and discussion regarding the management of spent fuels coming from all envisaged SMR types to enable experts to collaboratively identify the opportunities and challenges faced in all stages of the backend of the fuel cycle (storage, transportation, reprocessing & recycling, and disposal), gaps in current infrastructures and knowledge, and the potential ways to move forward in addressing them in the near, medium, and long terms.

## **Objectives**

The purpose of the event is to share technical information on the management of spent nuclear fuel from the operation of small modular reactors, to anticipate related opportunities and challenges, identify infrastructures and knowledge gaps and the potential ways to move forward in addressing them in the near, medium, and long term.

## **Target Audience**

The event is intended for participants from nuclear fuel cycle research organizations, nuclear power plants, utilities, operators, waste management organizations, regulatory bodies, universities and other organizations who are already engaged in the operation and subsequent management of spent nuclear fuels from different types of SMRs. Participants should be actively involved in the subject of the event and have considerable experience in the relevant activities

## **Working Language(s)**

English.

## Expected Outputs

The event will provide the basis for preparing a report compiling technical papers capturing the state of the art, discussions during the event, and recommendations for future activities to support the development and implementation of SMR nuclear fuel cycles from a spent fuel management perspective.

Discussions on potential synergies among different SMRs' fuel cycle options, challenges for the different stages of the backend of the fuel cycle, enablers for their implementation and the identification of new infrastructures to address those challenges are foreseen.

## Topics

Papers and presentations on the following topics are welcomed:

- National and international programmes for SMRs' nuclear fuel cycle options;
- SMRs' nuclear fuel cycle strategies and their potential synergies with current industrially implemented nuclear fuel cycle strategies;
- Impacts of SMRs' spent fuels on storage conditions and systems (wet and dry) and needs to address identified gaps and challenges;
- Impacts of SMRs' spent fuels on transportation systems and needs to address identified gaps and challenges;
- Impacts of SMRs' spent fuels on reprocessing and potential recycling routes and needs to address identified gaps and challenges;
- Challenges of SMRs' spent fuel disposal.

## Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **27 July 2022**. Participants who are members of an organization invited to attend are requested to send the **Participation Form (Form A)** through their organization to the IAEA by the above deadline.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required.

## Papers and Presentations

Participants are expected to present papers falling within the scope of topics listed above. All papers must be original and should not have been published elsewhere.

Participants who wish to give presentations are requested to submit a full paper in a two stage process. An abstract should be submitted before **27 July 2022** via the web-based file submission system IAEA-INDICO. The abstract should be **no more than three hundred words**. Once accepted, a full paper **with 10 pages maximum including figures and tables** is to be submitted via IAEA-INDICO not later than **31 August 2022**.

Papers can only be considered if the **Participation Form (Form A)** together with the **Form for Submission of a Paper (Form B)** have been submitted by the author to their competent national authority (e.g., Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or their organization for onward transmission to the Scientific Secretary of the event, not later than **27 July 2022**.

## Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)**, which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **27 July 2022**.

## Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page:

[www.iaea.org/events](http://www.iaea.org/events).

Participants are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

## Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

## IAEA Contacts

### Scientific Secretary:

#### **Ms Amparo González-Espartero**

Division of Nuclear Fuel Cycle and Waste Technology  
Department of Nuclear Energy  
International Atomic Energy Agency  
Vienna International Centre  
PO Box 100  
1400 VIENNA  
AUSTRIA

Tel.: +43 1 2600 22507

Fax: +43 1 26007

Email: [A.G.Espartero@iaea.org](mailto:A.G.Espartero@iaea.org)

### Administrative Secretary:

#### **Mr Andi Keco**

Division of Nuclear Fuel Cycle and Waste Technology  
Department of Nuclear Energy  
International Atomic Energy Agency  
Vienna International Centre  
PO Box 100  
1400 VIENNA  
AUSTRIA

Tel.: +43 1 2600 25809

Fax: +43 1 26007

Email: [A.Keco@iaea.org](mailto:A.Keco@iaea.org)

Subsequent correspondence on scientific matters should be sent to the Scientific Secretary/Secretaries and correspondence on other matters related to the event to the Administrative Secretary.

## **Event Web Page**

Please visit the following IAEA web page regularly for new information regarding this event:

[www.iaea.org/events/EVT2105850](http://www.iaea.org/events/EVT2105850)

# Participation Form

## Technical Meeting on Back End of the Fuel Cycle Considerations for Small Modular Reactors

IAEA Headquarters Vienna, Austria and virtual participation via Cisco WebEx

20–23 September 2022

To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary [A.G.Espartero@iaea.org](mailto:A.G.Espartero@iaea.org) and to the Administrative Secretary [A.Keco@iaea.org](mailto:A.Keco@iaea.org).

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

**Deadline for receipt by IAEA through official channels: 27 July 2022**

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms
Institution:		
Full address:		
Tel. (Fax):		
Email:		
Nationality:	Representing following Member State/non-Member State/entity or invited organization:	
If/as applicable: Do you intend to submit a paper?                      Yes <input type="checkbox"/> No <input type="checkbox"/> Would you prefer to present your paper as a poster?      Yes <input type="checkbox"/> No <input type="checkbox"/> Title: I plan to attend virtually:                                      Yes <input type="checkbox"/> No <input type="checkbox"/>		

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required.



# Form for Submission of a Paper

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Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

**Deadline for receipt by IAEA through official channels: 27 July 2022**

Title of the paper:		
If applicable: Abstract ID in IAEA-INDICO:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name(s) and first name(s) of author presenting the paper (same as in passport):	Mr/Ms:	
Mailing address:		
Tel. (Fax):		

Email:

I plan to attend virtually:

Yes  No

I hereby agree to assign to the International Atomic Energy Agency (IAEA):

- the copyright; or
- the non-exclusive, worldwide, free-of-charge licence (this option is only for those authors whose parent institution does not allow them to transfer the copyright for work carried out in that institution) granting the IAEA world rights for the use of the aforementioned material in this and any future editions of the publication, in all languages, and in all formats available now, or to be developed in the future (digital formats, hard copy etc.).

**Please note:** If granting the licence mentioned above, please supply any copyright acknowledgement text required.

Furthermore, I herewith declare:

- that the material submitted to the IAEA is original, except for such excerpts from copyrighted works as may be included with the permission of the copyright holders thereof, has been written by the stated authors, has not been published before, and is not under consideration for publication by another entity;
- that any permissions and rights to publish required for third-party content, including but not limited to figures and tables, have been obtained, that all published material is correctly referenced; and
- that the material submitted to the IAEA does not contain any libellous or other unlawful statements and does not contain any materials that violate any personal or proprietary rights of any person or entity.

**Date:**

**Signature of main author:**

# Grant Application Form

## Technical Meeting on Back End of the Fuel Cycle Considerations for Small Modular Reactors

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To be completed by the applicant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary [A.G.Espartero@iaea.org](mailto:A.G.Espartero@iaea.org) and to the Administrative Secretary [A.Keco@iaea.org](mailto:A.Keco@iaea.org).

**Deadline for receipt by IAEA through official channels: 27 July 2022**

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yy/mm/dd):	Nationality:	
I plan to attend virtually:	Yes <input type="checkbox"/> No <input type="checkbox"/>	

### 1. Education (post-secondary):

Name and place of institution	Field of study	Diploma or Degree	Years attended	
			from	to

### 2. Recent employment record (starting with your present post):

Name and place of employer/ organization	Title of your position	Type of work	Years worked	
			from	to

### 3. Description of work performed over the last three years:

### 4. Institute's/Member State's programme in field of event:

Date: \_\_\_\_\_ Signature of applicant: \_\_\_\_\_

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**Date:** **Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority \_\_\_\_\_**