



Technical Meeting on Advances in Nuclear Fuel Fabrication Technologies for Power Reactors

IAEA Headquarters, Vienna, Austria

26–28 June 2023

Ref. No.: EVT2205055

Information Sheet

Introduction

For decades the IAEA has supported Member States in improving fuel fabrication technology and maintaining it in optimal state to produce reliable fuels for power reactors. In the early 1980's, the IAEA has collaborated with Member States to present guidebooks on quality control (QC) of power reactor fuels based on practical experience of nuclear fuel fabrication. Since 1980's, the IAEA has frequently organized Technical Meetings or equivalent to foster the exchange of information on advances in fabrication technology for power reactor fuels.

In the last decade, fuel communities in Member States have achieved several advancements in fuel fabrication technology to support reliability, economics and safety of power reactor fuels, as demonstrated by automated processes, QA/QC technology improvements.

In the coming decade, more improvements are expected from the ongoing and future work, for example, deployment of High Assay Low Enriched Uranium (HALEU) fuel, deployment of accident tolerant and advanced technology fuels (ATFs) and use of reprocessed uranium fuel in light water reactors (LWRs); adaptation of new technology (such as computer-aided technology, 3-D printing technology, Artificial Intelligence (AI) technology, Nano technology); deployment of fuels for LWR-type small modular reactors (SMRs) and for fast reactor-type SMRs; mass production of coated particle fuels for modular gas cooled reactors.

Parallely, maintaining a good expertise in fuel fabrication technology has become a critical issue because of staff ageing and loss of knowledge due to staffing natural reduction.

Recognizing the importance of these circumstances, a Technical Meeting on the “Technical Challenges and Advances in Fuel Fabrication for Water Reactors: Recent Experiences and Future Prospects” was organized virtually on 8-11 November 2021, in order to provide a platform to facilitate the exchange of information on recent experience, and on-going and future activities in fuel fabrication technology. Contributed presentations were unfortunately not numerous enough to comprehensively cover all topics of interest. Therefore, the participants of the Technical Meeting and international experts advised the Scientific Secretary that another Technical Meeting would be necessary to collect more information on recent achievements in fuel fabrication technology before a documentation on the same subject could be initiated.

Objectives

The purpose of the event is to facilitate the exchange of up-to-date information on nuclear fuel fabrication technologies for operating and innovative power reactors.

Target Audience

The event is intended for staff members of nuclear fuel fabrication facilities, nuclear power plants, utilities, regulatory bodies and other organizations engaged in the design, operation and fabrication of power-reactor fuel. Participants should be actively involved in the subject of the event and have considerable experience of the relevant activities.

Working Language(s)

English.

Expected Outputs

The event will provide the basis for an IAEA Technical Meeting report compiling up-to-date information on nuclear fuel fabrication technologies for operating and innovative power reactors.

Structure

This event will comprise several technical sessions that cover the following seven topics:

- Powder and pellet,
- Fuel rod and assembly,
- QA/QC,
- Improvements of fabrication equipment and facilities,
- New type of fuel/material,
- Adaptation of new technology,
- Maintaining expertise.

Each technical session will include a group discussion to discuss specific issues related to the subject items of the session.

Topics

For each subject item listed above, the following topics or equivalent will be discussed:

- Powder and pellet, of which topics of interest can include:
 - Improvements of UO_2 conversion process,
 - Advanced sintering,
 - 3D printing of UO_2 ceramics and metallic uranium fuel,
 - Doped (UO_2 , MOX) pellets,
 - High Assay Low Enriched Uranium (HALEU) powder and pellets,
 - High density pellets (UN, TRISO based UC),
 - New or higher content of burnable absorbers.
- Fuel rod and assembly, of which topics of interest can include:
 - Improvement of fuel assembly components,
 - Improvement of rod and assembly welding processes,
 - MOX fuel rods and assembly,
 - Reprocessed uranium fuel rods,
 - HALEU fuel rods,
 - 3D printing of fuel assembly components,
 - ATF rods and assembly,
 - Fuel rods and assemblies for LWR-based SMRs and for liquid metal-cooled SMRs.
- QA/QC, of which topics of interest can include:
 - Advanced non-destructive testing methods,
 - Application of artificial intelligence (AI) technology to QC.
- Other type fuel/material, of which topics of interest can include:
 - New materials to mitigate stress corrosion cracking (SCC),
 - TRISO fuel fabrication process.
- Adaptation of new technology, of which topics of interest can include:
 - Virtual reality,
 - AI technology (except for QC application).
- Maintaining expertise.

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 **21 April 2023**. 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. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

Abstracts and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above.

Participants who wish to give presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should extend to no more than 3 pages (including figures and tables) and should not exceed 2000 words. It should be sent electronically to Ki Seob Sim, the Scientific Secretary of the event (see contact details below), not later than **5 May 2023**. Authors will be notified of the acceptance of their proposed presentations by **15 May 2023**.

Participants have to submit the presentation slides together with the **Form for Submission of a Paper (Form B)** to the Scientific Secretary of the event, not later than **18 June 2023**.

For this event, the submission of a full paper is not required.

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 Technical Meeting. 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 maximum 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 **21 April 2023**.

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.

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 as soon as possible to the nearest diplomatic or consular representative of Austria.

Additional Information

The event will be held in hybrid format with in-person and remote participants. The event will start on Monday, **26 June 2023**, at 10:00 (Vienna) and end on Wednesday, 28 June 2023, at 17:00 (Vienna). Detailed programme will be provided later to registered participants.

For remote participants, the WebEx link to access the meeting will be provided a week before the event.

IAEA Contacts

Scientific Secretary:

Mr Ki Seob Sim

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 21921
Fax: +43 1 26007
Email: K.S.Sim@iaea.org

Co-Scientific Secretary:

Ms Na An

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 22763
Fax: +43 1 26007
Email: N.An@iaea.org

Administrative Secretary:

Ms Safa ABU-TOAMEH

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 22681
Fax: +43 1 26007
Email: S.Abu-Toameh@iaea.org

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

Event Web Page (Note: this section will be added if 'Publish to Internet' is selected under the Services Tab)

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

www.iaea.org/events/EVENT_NUMBER

Participation Form

Technical Meeting on Advances in Nuclear Fuel Fabrication Technologies for Power Reactors

IAEA Headquarters, Vienna, Austria (and virtual participation via Cisco Webex)
26 –28 June 2023

To be completed by the participant and sent to the competent official 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 or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary K.S.Sim@iaea.org and to the Administrative Secretary S.Abu-Toameh@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: 21 April 2023

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"/> 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. The IAEA may also

Form for Submission of a Paper

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Deadline for receipt by IAEA through official channels: 18 June 2023

Title of the presentation:		
Family name(s) and first name(s) of 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:		

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- 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

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To be completed by the applicant and sent to the competent official 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 or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary K.S.Sim@iaea.org and to the Administrative Secretary S.Abu-Toameh@iaea.org

Deadline for receipt by IAEA through official channels: 21 April 2023

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: _____

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

use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.