



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Technical Meeting on the Technical Challenges and Advances in Fuel Fabrication for Water Reactors: Recent Experiences and Future Prospects

Virtual Event

8–11 November 2021

Ref. No.: EVT1905298

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. The last Technical Meeting on this subject was held in 2010.

In the last decade, fuel communities in Member States have achieved several advancements in fuel fabrication technology for water cooled reactors 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 for light water reactors (LWRs), use

of reprocessed uranium fuel in power reactors, adaptation of new technology (such as computer-aided technology, 3-D printing technology, Artificial Intelligence (AI) technology, Nano technology), deployment of fuels for future reactors (e.g. LWR-type small modular reactors, supercritical water 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, several Member States recommended that IAEA provides a platform to facilitate the exchange of information on recent experience, and on-going and future activities in fuel fabrication technology.

This event was intended to be held in Chengdu, China for 8-11 November 2021; however, due to global pandemic situation this event is restructured as an online meeting using WebEx for the same period.

Please note that designations already received for the Technical Meeting originally scheduled in China will remain valid for this virtual event.

Objective

The purpose of the event is to exchange information on recent experience, and on-going and future activities in fuel fabrication technology. The event will support Member States in addressing technical challenges encountered when fabricating new/advanced fuels for water 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.

Outputs

The event will provide the basis for the preparation of a technical report (TECDOC) on “Technical Challenges and Advances in Fuel Fabrication for Water Reactors: Recent Experiences and Future Prospects”.

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:
 - New reconversion processes,
 - Improvements of UO_2 conversion process,
 - Doped pellets,
 - New or higher content of burnable absorbers,
 - Reprocessed uranium,
 - Thermal mixed oxide (MOX) fuel powder and pellets.
- Fuel rod and assembly, of which topics of interest can include:
 - Improvement of fuel assembly components,
 - Improvement of rod and assembly welding processes,
 - Thermal MOX fuel rod and assembly,
 - Reprocessed uranium fuel rods,
 - High Assay Low Enriched Uranium (HALEU) fuel.
- QA/QC, of which topics of interest can include:
 - Vision inspection system.
- Improvements of fabrication equipment and facilities, of which topics of interest can include:
 - Streamlining processes,
 - Waste management – recycling,
 - Improved equipment and facilities.
- New type fuel/material, of which topics of interest can include:
 - New materials for bundle fabrication (e.g. Be-replacement material for CANDU),
 - Fabrication of Advanced Technology Fuels (including Accident Tolerant Fuel, SiC fuel,

Super-Critical Water Reactor (SCWR) fuel, Minor Actinides burning fuel, Inert Matrix Fuel (IMF), metallic fuel for water reactors).

- Adaptation of new technology, of which topics of interest can include:
 - Computer-aided technology,
 - 3-D printing, Nano technology,
 - Virtual reality,
 - Artificial intelligence (AI) technology.
- 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 **8 October 2021**. 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

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 **15 October 2021**. Authors will be notified of the acceptance of their proposed presentations by **30 October 2021**.

In addition, participants have to submit the abstract together with the Participation Form (Form A) [optional: and the attached Form for Submission of a Paper (Form B)] 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 IAEA not later than Submission Deadline.

Additional Information

The event will be held virtually. The event will start on Monday, **8 November 2021**, at 14:00 (Vienna) and will end on Thursday, 11 November 2021, at 17:00 (Vienna). Detailed programme will be provided later to registered participants.

IAEA Contacts

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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.