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International Atomic Energy Agency
Agence internationale de l'énergie atomique
Международное агентство по атомной энергии
Organismo Internacional de Energía Atómica

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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 the Technical Challenges and Advances in Fuel Fabrication for Water Reactors: Recent Experience and Future Prospects** (hereinafter referred to as "event") to be held in Chengdu, China, from **15 to 18 June 2020**.

The purpose of the event is to exchange information on recent experience and ongoing 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.

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 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 March 2020** using the attached Participation Form (Form A). Completed and authorized Participation Forms should be sent either by email to: 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, Mr Ki Seob Sim, Division of Nuclear Fuel Cycle and Waste Technology, Department of Nuclear Energy (Email: K.S.Sim@iaea.org), and to the Administrative Secretary, Ms Sakura Gyay De Goyaz (Email: S.Gyay-De-Goyaz@iaea.org). The Scientific Secretary of the event will liaise with the participants directly concerning further arrangements, including travel details, as appropriate, once 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 Secretariat of the International Atomic Energy Agency avails itself of this opportunity to assure the IAEA's Member States of its highest consideration.



2020-02-07

Enclosures: Information Sheet
 Participation Form (Form A)
 Form for Submission of a Paper (Form B)
 Grant Application Form (Form C)



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

Hosted by the

Government of People's Republic of China

through

China Nuclear Energy Industry Cooperation (CNEIC)

Chengdu, China

15–18 June 2020

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 time, 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 then, the IAEA has regularly 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 sized and modular reactors, supercritical water reactors).

On the other hand, maintaining expertise in fuel fabrication technology becomes a critical issue since loss of expertise is getting more significant mainly due to natural reduction.

Recognizing the importance of these circumstances, several Member States recommended that IAEA should provide a platform to facilitate exchange of information on recent experience, and on-going and future activities in fuel fabrication technology.

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.

Outputs

The event will provide the basis for the preparation of a technical report (TECDOC) including extended abstracts presented at the event.

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.

Structures

This event will comprise several technical sessions that covers the following seven subject items:

- Powder and pellet,
- Fuel rod and assembly,
- QA/QC,
- Improvements of fabrication equipment and facilities,
- New type 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

Under each of subject items above, the following topics or equivalent can be discussed. Note that topics are not limited to the listed items and can be expanded. Also note that Accident tolerant Fuel (ATF) specific fabrication is out of the scope of the event.

- Powder and pellet
 - New reconversion processes,
 - Fabrication of doped pellets,
 - Fabrication of fuel with new and higher content of burnable absorbers,
 - Improvements of conversion process for UO₂ and reprocessed uranium
 - Thermal MOX fuels (e.g. REMIX, CANMOX).
- Fuel rod and assembly
 - Elimination of helium gas in end closure welding (for CANDU),
 - Improvement of fuel assembly components,
 - Thermal MOX fuel rod and assembly (e.g. REMIX, CANMOX),
 - Reprocessed uranium fuel rods,
 - Development of all-welded bundle (for CANDU),
 - Manufacturing improvements for HALEU.
- QA/QC
 - Vision inspection system.
- Improvements of fabrication equipment and facilities
 - Streamlining processes,
 - Waste management – recycling,
 - Improved equipment and facilities.
- New type fuel/material
 - Be-replacement material (for CANDU),
 - Qualification of alternatives to CANLUB graphite (Siloxane and Zr liner; for PHWR),
 - Development of new-type fuels (fuels for Molten Salt Reactor, LWR-type Small sized and Modular Reactor, Super-Critical Water Reactor; Minor Actinides burning fuel, Inert Matrix Fuel (IMF), metallic fuel for water reactors).
- Adaptation of new technology
 - Computer-aided technology,
 - 3-D printing, Nano technology,
 - Virtual reality,
 - 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 28 February 2020. 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.

Please note that the IAEA is in a transition phase to manage the entire registration process for all regular programme events electronically through the new InTouch+ (<https://intouchplus.iaea.org>) facility, which is the improved and expanded successor to the InTouch platform that has been used in recent years for the IAEA's technical cooperation events. Through InTouch+, prospective participants will be able to apply for events and submit all required documents online. National authorities will be able to use InTouch+ to review and approve these applications. Interested parties that would like to use this new facility should write to: InTouchPlus.Contact-Point@iaea.org.

The event is, in principle, open to all officially designated persons. The IAEA, however, reserves the right to limit participation in case this becomes necessary due to limitations imposed by the available seating capacity. It is therefore recommended that interested persons take the necessary steps to obtain their official designation as early as possible.

Papers and Presentations

Participants are expected to give presentations falling within the scope of topics listed above. Approximately 30 minutes will be allotted for each presentation, including floor discussion.

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 one pages and should not exceed 400 words. It should be sent electronically to Mr Ki Seob Sim, the Scientific Secretary of the event (see contact details below), not later than **27 March 2020**.

In addition, participants have to submit the abstract together with the **Participation Form (Form A)** 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 **27 March 2020**.

The submission of a full paper implies that the author intends to participate in the event if it is accepted. Full papers should be 3–10 pages including figures and tables. Full papers should be prepared according to the guidelines provided in **Instructions for the Preparation of Papers (Attachment A)** and should be submitted to Scientific Secretary not later than **30 April 2020**. Final versions of the full papers should be submitted by **29 May 2020**, following the resolution of comments provided by the organizational committee.

In addition to the master (paper) copy, an electronic version of the paper (Word file) is necessary to ensure quality and timely issuance of the proceedings to be prepared and distributed in electronic format.

Visas

Participants who require a visa to enter France should submit the necessary application as soon as possible to the nearest diplomatic or consular representative of France.

Local Arrangements

The event will be held in **Chengdu, China** and will start on Monday, **15 June 2020**, at 9.30 a.m. and end on Thursday, 18 June 2020, at 5 p.m. A technical tour to a nuclear fuel fabrication plant will be arranged during the event.

All the material for the event, including the agenda and information on the exact venue as well as local arrangements, will be sent to designated participants once the completed Participation Form (Form A) has been received.

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 27 March 2020**.

Organization

Scientific Secretary

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Administrative Secretary

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

ATTACHMENT A: INSTRUCTIONS FOR THE PREPARATION OF PAPERS

Length

Papers should not exceed 3000 words.

Copyright

Authors are responsible for ensuring that nothing in their papers infringes any existing copyright. If previously copyrighted material is included, authors must provide evidence that the copyright holder has given permission for its use.

Manuscript

The original manuscript should be printed on one side of the paper only. The desired **layout** is shown in *Sample A* below. An electronic copy should be supplied with the original.

Margins: Top, bottom, right and left 2.5 cm.

Font: Times New Roman 12 or 11.

The paper must begin with an **abstract**. The abstract should be typed as one paragraph not exceeding 400 words and should not contain references or footnotes.

Figures and tables should be clear and reproducible. All figures and tables should be placed as near as possible to the place where they are first mentioned, but do not wrap text around them.

References and bibliography for background reading should be numbered in Arabic numerals in square brackets (e.g. [1]) and listed at the end of the paper.

Sample A

TITLE OF THE PAPER IN BOLD CAPITAL LETTERS

N. SURNAME 1, N. SURNAME 2

Organization 1

City, Country

N. SURNAME 3

Organization 2

City, Country

Abstract

This abstract should present a brief outline of the contents of the paper. It should not exceed 400 words.

1. INTRODUCTION

It is suggested that a brief introduction of the topic(s) discussed further in the following Sections of the paper be included.

2. SECTION TWO

2.1. Section two point one

2.1.1. Section two point one point one

2.1.1.1. Section two point one point one point one

3. CONCLUSIONS

NOMENCLATURES

ACKNOWLEDGEMENTS

REFERENCES

- [1] COX, B., Pellet-Clad Interaction (PCI) Failures of Zirconium Alloy Fuel Cladding – A Review, *Journal of Nuclear Materials* **172** (1989) 249.
- [2] FLOYD, M.R., “Extended Burnup CANDU Fuel Performance”, Proceedings of the 7th International Conference on CANDU Fuel, Kinston, Ontario, Canada, 23–27 September 2001.
- [3] HASTINGS, I. J., Effect of Initial Grain Size on Fission Gas Release from Irradiated Fuel, AECL-8124, Atomic Energy of Canada Limited, Chalk River, Ontario (1983).

TABLE 1. FUEL DESIGN SPECIFICATIONS

Reactor type	Design specifications
PWR	17x17 fuel assembly
BWR	10x10 fuel assembly
PHWR	37-fuel element bundle

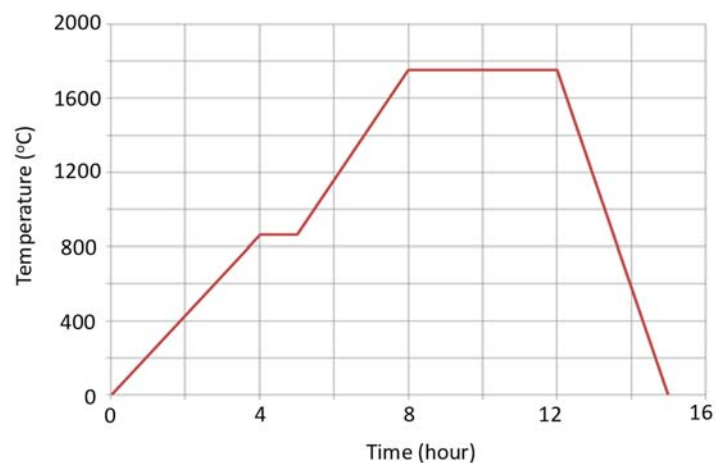


FIG.1 Sintering conditions for green pellets.

Participation Form

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

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15 to 18 June 2020

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 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.Gyay-De-Goyaz@iaea.org.

Please attach a passport copy or other document of identification (ID).

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 March 2020

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:		

Form for Submission of a Paper

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Deadline for receipt by IAEA through official channels: 27 March 2020

Title of the paper:		
If applicable: Abstract ID in IAEA-INDICO:		
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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Furthermore, I herewith declare:

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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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Deadline for receipt by IAEA through official channels: 27 March 2020

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:	

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 _____