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International Atomic Energy Agency

Agence internationale de l'énergie atomique

Международное агентство по атомной энергии

Organismo Internacional de Energía Atómica

Vienna International Centre, PO Box 100, 1400 Vienna, Austria

Phone: (+43 1) 2600 • Fax: (+43 1) 26007

Email: [Official.Mail@iaea.org](mailto:Official.Mail@iaea.org) • Internet: <https://www.iaea.org>

In reply please refer to: **EVT2105277**

Dial directly to extension: (+43 1) 2600-21921

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 Structural Behaviour of Fuel Assemblies in Water Cooled Reactors** (hereinafter referred to as "event") to be held virtually via Cisco Webex from **24 to 28 October 2022**.

The purpose of the event is to facilitate the exchange of information on the design, experimentation, operation and performance assessment of fuel assemblies in water cooled reactors.

The attached Information Sheet provides further details of the event.

The event will be held in English.

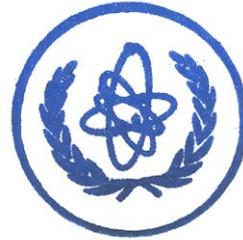
Member States are invited to designate one or more participants to represent the Government at this event. Member States are strongly encouraged to identify suitable women participants.

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 **30 June 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, Mr Ki Seob Sim, Division of Nuclear Fuel Cycle and Waste Technology, Department of Nuclear Energy (Email: [K.S.Sim@iaea.org](mailto:K.S.Sim@iaea.org)), and to the Administrative Secretary, Ms Nisha Nath-Sirimalwatta (Email: [N.Nath-Sirimalwatta@iaea.org](mailto:N.Nath-Sirimalwatta@iaea.org)). The Scientific Secretary of the event will liaise with the participants directly concerning further arrangements, 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.

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.



2022-05-17

Enclosures: Information Sheet

Participation Form (Form A)

Form for Submission of a Paper (Form B)



**IAEA**

International Atomic Energy Agency

*Atoms for Peace and Development*

# **Technical Meeting on the Structural Behaviour of Fuel Assemblies in Water Cooled Reactors**

**Virtual Event**

**24–28 October 2022**

**Ref. No.: EVT2105277**

## **Information Sheet**

### **Introduction**

Water-cooled reactor fuel assemblies are designed to ensure that they are robust and reliable with good performance in normal operating conditions, particularly under demanding operating conditions such as power uprates, high burnups, lower neutron leakages, cycle lengths up to 24 months and challenging water chemistry conditions. Since IAEA-TECDOC-1454 was published to document the proceedings of an IAEA Technical Meeting on fuel assembly structural behaviour, held in 2004, there has been a significant improvement in fuel assembly design, design and safety analyses (including fuel assembly bow and control rod drop kinetics, flow induced vibration and grid-to-rod fretting wear assessments, and seismic impact assessments), and testing to demonstrate the mechanical integrity and thermal hydraulic performance of fuel assemblies in water cooled reactors. Licensees are now requested to meet strengthened safety requirements established since the Fukushima-Daiichi accident in 2011. Furthermore, advanced water-cooled reactor designs have been developed to enhance the safety and economics, which includes Generation III/III+ large-sized reactors (e.g., ABWR, AP1000, APR-1400, CAP-1400, EPR, HPR1000, VVER TOI) and Generation IV supercritical water reactors as well as water-cooled small modular reactors (SMRs).

Some Member States participating in the plenary meeting of the Technical Working Group on Fuel Performance and Technology (TWG-FPT), in 2021, requested the IAEA to provide a platform that can facilitate the exchange of information on advancements in fuel assembly design, performance, testing

and modelling. Therefore, the IAEA has planned to organize a Technical Meeting on the Structural Behaviour of Fuel Assemblies in Water Cooled Reactors, to be held virtually on 24-28 October 2022.

## **Objectives**

The objective of the event is to facilitate the exchange of information on the design, experimentation, operation and performance assessment of fuel assemblies in water cooled reactors.

## **Target Audience**

The event is intended for staff members of nuclear fuel research organizations, nuclear power plants, utilities, national regulators and technical support organizations, universities, and other organizations engaged in the design, operation and fabrication of existing and advanced fuel assemblies for water-cooled reactors. 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 preparing a report consolidating presentations, papers and discussions of the event, recommendations for future activities to support the reliable performance of fuel assemblies in water cooled reactors.

## **Structure**

This event will cover mainly six technical areas as follows:

1. Experience in design and operation
2. Analysis tools and methodologies
3. LOCA/seismic analysis
4. Tests and related modelling for data assessment
5. Retrievability and handling of used fuel
6. Regulatory aspects and lessons learned during the licensing process.

## Topics

Under the above Technical Area 1, discussions might include (without limiting to) the following topics:

- New fuel assembly designs (including improvements of grid assemblies and components),
- Advanced channel box materials (BWR),
- Debris solutions and impact on the mechanical behaviour of fuel assemblies,
- Dropping of fresh fuel assembly(es) during reloading operation,
- Flow induced vibration and impact on fuel assembly design,
- Shortened fuel assemblies for water-cooled SMRs, etc.

Under the above Technical Area 2, discussions might include (without limiting to) the following topics:

- Approaches for justification of combined loads from postulated initiating events and operational states,
- Methodologies currently used by licensees and accepted by national regulators,
- New approaches to quantify operating and safety margins relying on multi-physics modelling and simulations, from the fuel assembly mechanical behaviour standpoint,
- Fluid-structure interaction,
- Mixed core configurations (e.g., interactions between neighbouring fuel assemblies with different designs or supplied by different vendors),
- Fuel assembly thermal-mechanical analysis to provide inputs to interfacing systems such as neutronic design and thermalhydraulic design,
- Verification and validation of computer codes for fuel assembly mechanical behaviour analysis, etc.

Under the above Technical Area 3, discussions might include (without limiting to) the following topics:

- Control rod insertion under high seismic motion,
- Design solutions in order to guarantee a coolable geometry in a design extension condition without significant fuel degradation (e.g., LOCA followed by seismic event), etc.

Under the above Technical Area 4, discussions might include (without limiting to) the following topics:

- Thermalhydraulic tests,
- Mechanical tests,
- Seismic tests, etc.

Under the above Technical Area 5, tests or assessments to ensure the retrievability of used fuel from the spent fuel pool and from the interim storage might be discussed.

Under the above Technical Area 6, elements of national regulation as well as lessons learned during the licensing process might be discussed.

## Participation and Registration

All persons wishing to participate in this virtual 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 **30 June 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.

## Abstracts 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 presentation. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should be **more than one page and no more than three pages**. It should be sent electronically to Mr Ki Seob Sim, the Scientific Secretary of the event (see contact details below), not later than **30 June 2022**.

Participants have to submit the full paper together with the **Form for Submission of a Paper (Form B)** directly to the Scientific Secretary of the event, not later than **30 August 2022**.

Participants also have to submit the presentation slides directly to the Scientific Secretary of the event, not later than **30 September 2022**.

## Local Arrangements

The Technical Meeting will be conducted in virtual format using Cisco WebEx. The agenda and link to access the online meeting will be sent to the designated participants 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](mailto:K.S.Sim@iaea.org)

### **Co-Scientific Secretary:**

#### **Mr Simone Massara**

Division of Nuclear Installation Safety  
Department of Nuclear Safety and Security  
International Atomic Energy Agency  
Vienna International Centre  
PO Box 100  
1400 VIENNA  
AUSTRIA

Tel.: +43 1 2600 22680

Fax: +43 1 26007

Email: [S.Massara@iaea.org](mailto:S.Massara@iaea.org)

**Administrative Secretary:**

**Ms Nisha Nath-Sirimalwatta**

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 22767

Fax: +43 1 26007

Email: [N.Nath-Sirimalwatta@iaea.org](mailto:N.Nath-Sirimalwatta@iaea.org)

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

# Participation Form

## Technical Meeting on the Structural Behaviour of Fuel Assemblies in Water Cooled Reactors

Virtual Event

24–28 October 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 [K.S.Sim@iaea.org](mailto:K.S.Sim@iaea.org) and to the Administrative Secretary [N.Nath-Sirimalwatta@iaea.org](mailto:N.Nath-Sirimalwatta@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: 30 June 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 make a presentation?                      Yes <input type="checkbox"/> No <input type="checkbox"/>		
Title:		

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

## Technical Meeting on the Structural Behaviour of Fuel Assemblies in Water Cooled Reactors

### Virtual Event

**24–28 October 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 [K.S.Sim@iaea.org](mailto:K.S.Sim@iaea.org) and to the Administrative Secretary [N.Nath-Sirimalwatta@iaea.org](mailto:N.Nath-Sirimalwatta@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: 30 August 2022**

Title of the presentation:		
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:		

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**Date:**

**Signature of main author:**