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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

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

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

Email: Official.Mail@iaea.org • Internet: <https://www.iaea.org>

In reply please refer to: **EVT2003082**

Dial directly to extension: (+43 1) 2600-22680

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 Licensing of Advanced Nuclear Fuels for Water Cooled Reactors** (hereinafter referred to as "event") to be held virtually via Cisco Webex, from **18 to 22 October 2021**.

The purpose of the event is to provide a platform for Member States to share their national practices in the licensing (or in the preparatory steps prior to licensing) of advanced nuclear fuels for water cooled reactors. The event will focus on the development and qualification of advanced nuclear fuels, as well as on the experience of national regulators in the revision of national regulations specifically applicable to the licensing of nuclear fuel, with the objective of facilitating the licensing of advanced nuclear fuels for 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 two professionals from national regulators, technical support organizations, fuel developers or licensees with a specialized knowledge of, or experience in, nuclear fuel design and licensing. Member States are strongly encouraged to identify suitable women participants.

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 **17 September 2021** 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 Simone Massara, Division of Nuclear Installation Safety, Department of Nuclear Safety and Security (Email: S.Massara@iaea.org), and to the Administrative Secretary, Ms Daniela Majid Khan (Email: D.Majid-Khan@iaea.org). The Scientific Secretary of the event will liaise with the participants directly concerning further arrangements, 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.

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.



2021-05-18

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



Technical Meeting on the Licensing of Advanced Nuclear Fuels for Water Cooled Reactors

Virtual Event

18–22 October 2021

Ref. No.: EVT2003082

Information Sheet

Introduction

IAEA Safety Standards Series No. SSR-2/1 (Rev. 1) (*Safety of Nuclear Power Plants: Design*) establishes design requirements for the structures, systems and components of a nuclear power plant (NPPs), as well as for procedures and organizational processes required for the safe operation and for prevention and mitigation of events that could compromise safety, were they to occur. The revised version published in 2016 contains a set of amendments and additions to strengthen the requirements and facilitate their implementation, incorporating lessons learned from the Fukushima Daiichi accident occurred in Japan in 2011 as well as other valuable experience gained on strengthening design safety of nuclear power plants.

In the field of nuclear fuel and reactor core design, recommendations and guidance on how to comply with IAEA SSR-2/1 (Rev. 1) safety requirements are contained in the Specific Safety Guide SSG-52 (*Design of the Reactor Core for Nuclear Power Plants*), published in 2019.

IAEA SSG-52 is intended mainly for NPPs that use natural and enriched UO₂ fuels and plutonium-blended UO₂ (mixed oxide fuel) with zirconium based alloy cladding; hence, for innovative fuel materials, such as uranium nitride fuel or inert matrix fuels, or cladding materials other than zirconium based alloys, this Safety Guide should be applied with judgement.

The development of advanced nuclear fuels with enhanced performance and improved behaviour in accident conditions was accelerated after the Fukushima-Daiichi accident. Various national projects, coordinating efforts from R&D organizations and industry, were initiated to develop and qualify new

fuels for water-cooled reactors, aiming at achieving an improved behaviour in accident conditions, while maintaining or improving the performance during nominal operation and operational transients. Specific researched attributes include reduced reaction kinetics with steam; lower hydrogen generation rate; reduction of stored energy in the core; attractive operational in-reactor and fuel cycle performances.

As a few short-term technologies are approaching high levels of technology readiness, regulators in some Member States are undertaking preparatory steps required to allow (or better streamline) licensing applications, by checking whether current safety requirements, acceptance criteria and regulatory guidance documents would be applicable for advanced fuels licensing, updating these if necessary.

In this context, the IAEA's Safety Assessment Section is developing an IAEA Technical Document (TECDOC) on the Status of knowledge for the licensing of advanced nuclear fuels for water-cooled reactors.

The objective of this TECDOC will be to identify and collect the status of knowledge in Member States on the applicability to advanced fuels of the safety requirements, acceptance criteria and regulatory guidance documents which have been developed for the licensing of current nuclear fuel systems. Whether an update of the current safety requirements, acceptance criteria and regulatory guidance documents was judged necessary for the licensing of advanced fuels, the TECDOC will present specific approaches currently undertaken by Member States, with a focus on short-term technologies and, as much as feasible, on long-term ones.

Objectives

The objective of the event is to provide a platform to Member States to share their national practices in the licensing (or in the preparatory steps prior the licensing) of advanced nuclear fuels for water-cooled reactors. The meeting will focus on the development and qualification of advanced nuclear fuels (with expected input by fuel developers and licensees) as well as on the experience by national regulators in the revision of national regulations specifically applicable to the licensing of nuclear fuel, with the objective to facilitate the licensing of advanced nuclear fuels for water-cooled reactors.

The material presented during the event, along with the results of the technical discussions, will provide valuable input for the development of a final version of the TECDOC on the Status of knowledge for the licensing of advanced nuclear fuels for water-cooled reactors.

Target Audience

The event aims at gathering representatives from national regulators, technical support organizations, fuel developers and licensees with specialized knowledge of, or experience in, nuclear fuel design and licensing.

Working Language(s)

English.

Topics

Topics to be discussed will include:

- Development, qualification and licensing of advanced nuclear fuels for water-cooled reactors including advanced fuel materials (including improved UO₂, high-density fuels, metal fuel, ceramic composite fuels, high burn-up fuels, etc.) and advanced cladding materials (including coated and improved zirconium-alloys, advanced steels, SiC-SiC composite, etc.);
- Licensing of Lead-Test Assemblies and Lead-Test Rods;
- Member States' experience in the revision (or in the development of plans for future revisions) of national regulations and/or regulatory guidance including safety principles, requirements, acceptance criteria specifically applicable to the licensing of nuclear fuel, with the objective to facilitate the licensing of advanced nuclear fuels for water-cooled reactors, focusing on design and operation;
- Member States' experience in the application of IAEA SSG-52 for the design and licensing of advanced nuclear fuels for water-cooled reactors.

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 **17 September 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 technical matters.

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 2 pages (including figures and tables) and should not exceed 500 words. It should be sent electronically to Mr Simone Massara, the Scientific Secretary of the event (see contact details below), not later than **17 September 2021**. Authors will be notified of the acceptance of their proposed presentations by the **1 October 2021**.

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 the **1 October 2021**.

IAEA Contacts

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

Administrative Secretary:

Ms Daniela Majid Khan

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 22519

Fax: +43 1 26007

Email: D.Majid-Khan@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.

Participation Form

Technical Meeting on the Licensing of Advanced Nuclear Fuels for Water Cooled Reactors

Virtual Event

18–22 October 2021

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 S.Massara@iaea.org and to the Administrative Secretary D.Majid-Khan@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: 17 September 2021

| | | |
|---------------------------------------|--|-------|
| 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 | No |
| Title: | | |



Form for Submission of a Paper

Technical Meeting on the Licensing of Advanced Nuclear Fuels for Water Cooled Reactors

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| Title of the paper: | | |
| If applicable: Abstract ID in IAEA-INDICO: | | |
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