



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Technical Meeting on the Design, Fabrication and Irradiation Behaviour of Small Modular Reactor Fuels

Virtual Event

18–22 October 2021

Ref. No.: EVT2100352

Information Sheet

Introduction

There is an ongoing interest from Member States in the deployment of Small Modular Reactors (SMRs). SMR development is driven mainly by taking account of economic benefits from modularity and low capital investment, siting flexibility and great efficiency being coupled with other energy sources as well as enhanced safety and security.

There are more than 50 SMR designs and concepts worldwide, ranging from scaled down versions of existing nuclear reactor designs to entirely new Generation IV designs. Most of them are in various developmental stages and some are already deployed. As a consequence, SMR fuels have also been developed with various designs and concepts. In general, they are grouped into:

- Fuels for water-cooled SMRs,
- Fuels for high temperature gas-cooled SMRs,
- Fuels for fast SMRs (that include sodium-cooled, lead-cooled, gas-cooled reactors), and
- Fuels for Molten Salt Reactors.

Regardless of their designs and concepts, all SMR fuels are essentially designed to allow for high burnup and long fuel cycles.

Experience with conventional fuels used in power reactors can provide a great support to some SMR fuel designs including water-cooled reactor fuels, high temperature gas-cooled reactor fuels. For most SMR fuel designs, however, they are at early stage on development curve and need much more work

till implementation in the reactor.

There have been no fora organized to exchange information on the design, fabrication, operation and post irradiation examinations of SMR fuels. The IAEA intends to organize a Technical Meeting in 2021 to facilitate the exchange of information on all aspects of SMR fuels.

Objectives

The purpose of the event is to exchange information on recent experiences as well as ongoing and future improvements in the design, fabrication and irradiation behaviour of small modular reactor fuels.

Target Audience

The event is intended for staff members of nuclear fuel research organizations, nuclear power plants, utilities, regulatory bodies, universities and other organizations engaged in the design, operation and fabrication of existing and innovative power-reactor fuels. 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 compiling presentations and discussions of the event, recommendations for future activities to support the development and qualification of SMR fuels.

Structure

This event will comprise five main technical sessions as follows:

1. Fuels for water-cooled SMRs,
2. Fuels for high temperature gas-cooled SMRs,
3. Fuels for fast SMRs,
4. Fuels for Molten Salt SMRs,
5. Panel discussions on special issues.

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

Topics

Under Technical Sessions 1 through 4, the following topics can be discussed:

- Design,
- Fabrication,
- Material properties,
- In-reactor and out-reactor tests,
- Irradiation performance analyses,
- Fuel modelling and computer code developments,
- Post irradiation examinations,
- National or international programmes for development,
- Fuel cycle strategies, their assessment tools,
- Sample packaging and irradiated material disposition,
- Transportation logistics and improvements.

Under Technical Session 5, the following topics can be discussed:

- Review of draft TECDOC on “Coated Particle Fuels for High Temperature Gas-Cooled, Small Modular Reactors – Technical Challenges and Future Prospects”,
- Technical challenges that may be encountered in deploying water-cooled SMR fuels,
- Future prospect for the development of innovative SMR fuels,
- IAEA’s role in dealing with technical challenges and future prospect of SMR fuel deployment.

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 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.

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 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 July 2021**.

Participants have to submit the presentation slides together with the **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 Scientific Secretary of the event, not later than **30 August 2020**.

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

Additional Information

The TM will be conducted via online meeting using WebEx. The agenda and link to access the online meeting will be sent to the designated participants before the event.

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.