Eighth Joint IAEA–GIF Technical Meeting/Workshop on the Safety of Liquid Metal Cooled Fast Reactors

IAEA Headquarters
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Information Sheet

A. Introduction

The International Atomic Energy Agency (IAEA) and the Generation IV International Forum (GIF) have jointly committed to collaboration between their respective programmes, and to share information in selected areas of mutual interest. One of the key areas of emphasis in both the GIF and the IAEA programmes is the safety of liquid metal cooled fast reactors (LMFRs) including sodium cooled fast reactors (SFRs) and lead or lead-bismuth eutectic (LBE) cooled fast reactors (LFRs). A particularly important area of mutual interest is the harmonization of safety approaches, safety requirements, Safety Design Criteria (SDC), and Safety Design Guidelines (SDG) for the next-generation advanced LMFRs under development worldwide. This topic has gained increased importance in the aftermath of the accident that occurred in 2011 at the Fukushima Daiichi nuclear power plant, which drew renewed attention to nuclear safety and to the importance of an international safety framework for reactors currently in operation as well as for new designs.

Within the framework of this collaboration, six joint IAEA–GIF Technical Meetings/workshops on the safety of SFRs have so far been held since 2010. Lead and LBE cooled fast reactors were included in the agenda since the seventh joint IAEA–GIF workshop on LMFR safety conducted from 27 to 29 March 2018 in Vienna.

The development of SDC for SFRs was initiated by the GIF Policy Group in 2011 to harmonize safety requirements among the design organizations represented within the GIF, and to quantify the high level of safety expected of Generation IV systems. The SDC, which are derived from the Generation IV programme goals and are developed consistently with the structure of the IAEA safety standards, were

compiled into a Phase 1 report first presented and discussed at the third IAEA–GIF workshop, and then issued by the GIF in May 2013.

The GIF Policy Group decided, in July 2013, to invite regulators from GIF member countries as well as experts from some international organizations (the IAEA, the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), and the Multinational Design Evaluation Programme) to review the Phase 1 report, and to proceed with the Phase 2 work intended to, firstly, quantify the SDC for SFRs and, secondly, to develop detailed SDG that would support the implementation of the general criteria. At the same time, the GIF and the IAEA agreed to invite design organizations currently developing innovative SFRs to present engineering solutions that would be able to comply with the SDC.

Consequently, the fourth joint IAEA–GIF workshop, held in Vienna from 10 to 11 June 2014, focused on: (a) the status of the review of the SDC Phase 1 report by regulators and experts from international organizations; (b) the implementation of current SDC by the designers of innovative SFR concepts, i.e. the China Institute of Atomic Energy, the French Alternative Energies and Atomic Energy Commission, AREVA, Électricité de France, the Indira Gandhi Centre for Atomic Research, Bharatiya Nabhikiya Vidyut Nigam Limited, the Japan Atomic Energy Agency, the Korea Atomic Energy Research Institute, the Afrikantov Experimental Design Bureau for Mechanical Engineering, the Oak Ridge National Laboratory and General Electric; and (c) examples of the implementation of specific SDC, i.e. practical elimination of accident situations, design extension conditions, and positive sodium void reactivity effect.

Continuing these efforts, at the fifth joint IAEA–GIF workshop, held from 23 to 24 June 2015, there were constructive discussions on the updated SDC/SDG for SFRs and related activities. Also at this workshop, the status of the international review of the SDC Phase 1 report and of Phase 2 of the development of the SDG was discussed. Responses from the United States Nuclear Regulatory Commission, the IAEA's comments on the SDC Phase 1 report, and comments by France's Institute for Radiological Protection and Nuclear Safety on the SDC Phase 1 report were also considered. The GIF report entitled Safety Design Guidelines on Safety Approach and Design Conditions for Generation IV Sodium-cooled Fast Reactor Systems (hereafter referred to as "the SDG report on safety approach/design conditions") was reviewed and discussed, and its status was updated.

A letter from the GIF's SDC Task Force was received by the IAEA in April 2016, in which it was noted that early engagement with regulatory organizations on the proposed SDG might reduce licensing uncertainties and promote safety. Therefore, the SDC Task Force invited GIF member countries as well as international bodies, such as the IAEA and the Joint CNRA–CSNI Ad-hoc Group on the Safety of Advanced Reactors (an OECD/NEA group consisting of members from both the Committee on Nuclear Regulatory Activities (CNRA) and the Committee on the Safety of Nuclear Installations (CSNI)), to review the SDG report on safety approach/design conditions.

At the sixth joint IAEA–GIF Technical Meeting/workshop held in November 2016, participants discussed the SDG report on safety approach/design conditions, taking into account the status of the ongoing efforts by the GIF's SDC Task Force to develop the SDG report on key structures, systems and components. It was noted that the SDG report on safety approach/design conditions fulfilled the goals of the GIF Policy Group's SDC Task Force; that safety requirements and design recommendations had been harmonized among GIF designers; and that the SDG report on safety approach/design conditions provided comprehensive recommendations for SFR design to assist reactor developers. Preliminary comments by the IAEA were reported on, and recommendations were summarized. The IAEA's detailed review of the SDG report on safety approach/design conditions was subsequently finalized and sent to the GIF at the beginning of 2017. The meeting/workshop provided a valuable contribution to the further development of that report and took into account feedback and updates based on technical knowledge

of the implementation of the SDC/SDG for innovative SFR design concepts. The meeting/workshop concluded that it was important to continue discussion of SFR safety among the GIF, the IAEA, SFR reactor developers, regulatory bodies, and technical and scientific support organizations (TSOs).

The final version of the GIF report on "Safety Design Guidelines on Safety Approach and Design Conditions for Generation IV Sodium-cooled Fast Reactor Systems" was discussed in depth at the seventh IAEA–GIF workshop held in Vienna from 27 to 29 March 2018. The title of this series of meetings/workshops has been expanded to cover not only SFRs but also the other types of liquid metal coolants being considered by the GIF, including lead and LBE cooled fast reactors.

Considering the recommendations of the 51st meeting of the Technical Working Group on Fast Reactors held in May 2018 and the plans of the GIF's SDC Task Force, and in order to continue in-depth discussions on the development of SDC/SDG for SFRs and LFRs, the IAEA is organizing the Eighth Joint IAEA–GIF Technical Meeting/Workshop on the Safety of Liquid Metal Cooled Fast Reactors from 20 to 22 March 2019 in Vienna. The workshop will follow the two-day 13th IAEA-GIF Interface Meeting.

B. Objectives

The main objectives of this meeting/workshop are to:

- Discuss the development of the draft GIF report provisionally entitled *Safety Design Guidelines on Key Structures, Systems and Components*;
- Discuss the development of the Safety Design Criteria and Safety Design Guidelines for lead and lead-bismuth cooled fast reactors; and
- Share information on the implementation of SDG for SFRs and SDC for LFRs by the designers of the innovative LMFR concepts.

C. Target Audience

The target audience for the meeting/workshop comprises:

- Representatives of GIF member countries;
- Representatives of research and design organizations responsible for innovative LMFRs that are currently under development;
- Representatives of regulatory bodies and TSOs; and
- Experts from the IAEA's Department of Nuclear Energy and Department of Nuclear Safety and Security.

D. Working Language(s)

The event will be held in English. No interpretation will be provided.

E. 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 15 February 2019. 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.

F. 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 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 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 **15 February 2019**.

G. Venue

The event will be held at the Vienna International Centre (VIC) where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page: http://www-pub.iaea.org/iaeaevents/GeneralInfo/Guide/VIC.

Participants are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

H. Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

I. IAEA Contacts

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