IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on Synergies Between Nuclear Fusion Technology Developments and Advanced Nuclear Fission Technologies

IAEA Headquarters, Vienna, Austria
and virtual participation via Cisco Webex

6–10 June 2022

Ref. No.: EVT2103079

Information Sheet

Introduction

The International Atomic Energy Agency aims to support and strengthen its Member States' capabilities in the field of technology development of nuclear fission and fusion for energy production.

With the aim to address the resolution of the IAEA General Conference GC64 and the SAGNE recommendation and taking into account the worldwide acceleration towards the early deployment of nuclear fusion for energy production, it is the appropriate time for the IAEA to launch a new initiative aimed at addressing the great engineering challenge of fusion, by promoting transfer of technology and know-how from fission to fusion. In other words, the IAEA is in the best position to identify and analyse, with an international perspective, all the possible synergies on technology development and deployment between nuclear fission and nuclear fusion.

The fission based nuclear power plants have a long history of development and operational experience; the advanced nuclear fission reactors are at an early stage of deployment and several lessons are being learned in the process of their development. It is expected that the development of future fusion based nuclear power plants for energy production will face many challenges already well-known and

addressed for the deployment of nuclear fission power technology, from design to construction to decommissioning through operation, including, infrastructure needs and economic competitiveness. While the fusion technology is rapidly maturing through the realization of large experimental facilities like ITER and other innovative fusion machines (also funded by the private sector), it is of paramount importance to develop a thorough techno-economic understanding of the subject matter for an optimized and well-informed development path of nuclear fusion power plants.

Member States and stakeholders will benefit from better understanding of the synergies between fission and fusion; they will also get acquainted of the status of cooperation between the two communities and will receive recommendations on how to enhance relevant technology and knowledge transfers from fission to fusion.

Purpose

The purpose of the event is to provide a forum for the exchange of information on, as well as to present an up-to-date review of, activities related to synergies in technology development between nuclear fission and fusion for energy production at the national and international levels. The event will also be used to present the work already done by the Secretariat.

Objectives

Specific objectives of the event are:

- Promote and facilitate the exchange of information on synergies between advanced nuclear fission and fusion technologies;
- Summarize the current status of cooperation between fission and fusion technology development, presenting up-to-date information and material;
- Present the work already done by the chapter leaders to develop the NES publication;
- Document the discussions and major findings among subject matter experts to support Member States to better understand and benefit from the synergies between fission and fusion;
- Distribute the tasks to finalize the different chapters/sections of the document.

The NES publication will provide insight on all these areas as well as examples of good practices and lessons learned and will offer suggestions to accelerate the transfer of technology, knowledge, and know-how from fission to fusion.

Target Audience

The meeting is open to all Member States involved or interested in the research and development of fission and/or fusion technology and their synergies, including government organizations (policymakers, analysts, regulators, and R&D agencies) and industry stakeholders (vendors, engineering companies, plant operators and technology developers).

Working Language

The working language of this meeting will be English with no interpretation provided. All communications, abstracts and papers must be submitted in English.

Expected Outputs

The expected outputs are:

- Recommendations to the IAEA on how to enhance relevant technology and knowledge transfers from fission to fusion;
- A first draft (extended abstracts from 2 to 5 pages) per topic to develop the chapters for the IAEA publication describing the current status of cooperation between fission and fusion technology development.

Topics

The event will consist of presentations and discussions at technical sessions. All contributions will be categorized based on the following topics:

1. Status of fusion technology: needs and challenges

2. Scenario studies: nuclear fusion reactors as an element of future energy systems

3. Technology, safety, security and safeguardability for synergies and know-how transfer:

- Energy conversion systems

- Structural materials and circulating fluids (Neutron irradiation resistant materials, Temperature stable materials, Compatibility with circulating fluids and mitigation strategies, Protective coatings, Corrosion resistant materials, Fluid handling and purification)

- Waste technology

- Decommissioning by design

- Fuel cycle

- Detritiation technologies
- Remote handling
- Diagnostics, instrumentation, and other experimental techniques
- Nuclear data
- Modelling and simulations
- Design Safety, Safety Analysis and Regulation (Introduction and scope, Regulatory, Design Safety, Safety Analysis, External Hazards, Emergency Preparedness and Response)
- Project management and management systems
- Manufacturing and supply chain
- Construction and commissioning
- Operation and maintenance
- Safeguards

4. Economic and market considerations
   - Economics of energy systems
   - Lessons learned from 70 years of nuclear fission reactors deployment
   - Economic and market considerations on nuclear fusion power plants
5. Human Resources and Knowledge management
   - Mapping human resources needs and identification of common professional competencies
   - Knowledge management strategies and techniques
6. Fission-fusion hybrid systems
7. General considerations on needed infrastructure
8. Stakeholder involvement
   - Start-ups
   - Public acceptance and support
9. Considerations and suggestions for future work in the field

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 **1 March 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 above deadline. Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Extended Abstracts

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 extended abstract of their work on the session topics listed above.

The extended abstract should contain title, contributing author(s) names and affiliation, must be written in English, and provide sufficient information on the contents of the proposed paper for evaluation. The extended abstract will be reviewed as part of the selection process for presentations. The extended abstract (2-5 pages in length) should be written in Microsoft Word format using the attached template. It should be uploaded to INDICO website (https://conferences.iaea.org/event/285) not later than **1 March 2022**. Authors will be notified of the acceptance of their proposed presentations by **1 April 2022** and provided with peer-review feedback. The authors will then be requested to submit revised extended abstracts by **1 June 2022**.

The extended abstract should be submitted 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 **1 March 2022**.

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 1 March 2022**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Optionally, virtual participation via Cisco Webex will be provided. 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: www.iaea.org/events.

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.

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.

Key Deadlines and Dates

ACTION	DATE
Extended abstract submission deadline / Start of peer review; Submission of the Participation Form (Form A) Submission of the Form for Submission of a Paper (Form B); Submission of the Grant Application Form (Form C), if applicable	**1 March 2022**
Notification of acceptance of extended abstract by the IAEA	1 April 2022
Review comments submitted to authors	1 May 2022
Revised extended abstract submission deadline	1 June 2022
Technical Meeting in Vienna (Austria)	**6–10 June 2022**

IAEA Contacts

Scientific Secretaries:

Mr Vladimir Kriventsev
Nuclear Power Technology Development Section
Division of Nuclear Power
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 2600 22808
Fax: +43 1 26007
Email: V.Kriventsev@iaea.org

Ms Sehila M. Gonzalez de Vicente
Physics Section
Division of Physical and Chemical Sciences
Department of Nuclear Sciences and Applications
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 2600-21753
Fax: +43 1 26007
Email: S.M.Gonzalez-De-Vicente@iaea.org

Administrative Secretary:

Ms Khurshida Abdurasulova

Nuclear Power Technology Development Section
Division of Nuclear Power
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 2600 24236
Fax: +43 1 2600 29598
Email: K.Abdurasulova@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.