



**Technical Meeting on
Fast Reactors and Related Fuel Cycle Facilities with
Improved Economic Characteristics**

**IAEA Headquarters
Vienna, Austria**

**Vienna International Centre:
Building A, Room A0531**

11–13 September 2013

INFORMATION SHEET AND CALL FOR PAPERS

1. INTRODUCTION AND BACKGROUND

As recently reaffirmed in the concluding statement of the International Ministerial Conference on Nuclear Power in the 21st Century, organized by the International Atomic Energy Agency (IAEA) and hosted by the Government of the Russian Federation in Saint Petersburg in June 2013, “fast reactors, closed fuel cycles and re-using of nuclear fuel are some of the key options in enhancing the sustainability of future nuclear systems. Fast reactors can reduce waste streams and improve efficient use of uranium”.

Actually, fast neutron systems offer the possibility to fully exploit the energy potential of natural resources (uranium and thorium), as well as to transmute the transuranic elements which are responsible for the highest heat load and radiotoxicity of long term nuclear waste. Fast neutron systems will therefore play an increasingly important role in the future, and will help to ensure that nuclear energy remains a sustainable long term option in the world’s overall energy mix.

In recognition of the importance of fast reactors for the sustainability of the nuclear option, there is currently renewed worldwide interest in the development of fast reactor technology, as indicated, e.g., by the outcomes of recent scenario studies of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) and of the Generation IV International Forum (GIF) where four out of the six innovative systems being developed are fast reactors (the sodium cooled fast reactor, the heavy liquid metal cooled fast reactor, the gas cooled fast reactor, and the molten salt fast reactor). Currently, fast reactor construction projects are under way in India (Prototype Fast Breeder Reactor) and the Russian Federation (BN-800), while in China the first experimental fast reactor (China Experimental Fast Reactor) was connected to the grid in 2011. Innovative fast reactor concepts, in particular sodium cooled systems and heavy liquid metal cooled systems, are under development also in Europe (in particular in France), Japan, the Republic of Korea, China, India, the Russian Federation and the United States of America.

However, in order to fully satisfy all the criteria related to the sustainability of nuclear energy, the development of cost effective fast reactors along with related advanced fuel cycle technologies is also of paramount importance in view of their large scale industrial deployment. Without demonstrating its economic affordability and in particular the possibility to reduce the unit construction cost of a new nuclear power plant, fast reactor technology could potentially fail to become a viable option for sustainable energy development.

In recent years, engineering oriented work, rather than basic research and development (R&D), has led to significant progress in improving the economics of innovative fast reactors and associated fuel cycle facilities, while maintaining and even enhancing the safety features of these systems. Optimization of plant size and layout, more compact designs, reduction of the amount of plant materials and the building volumes, higher operating temperatures to attain higher generating efficiencies, improvement of load factor, extended core lifetimes, high fuel burnup, etc. are good examples of achievements to date that have improved the economics of fast neutron systems.

The IAEA, through its Technical Working Group on Fast Reactors (TWG-FR) and Technical Working Group on Nuclear Fuel Cycle Options and Spent Fuel Management (TWG-NFCO), devotes many of its initiatives to encouraging technical cooperation and promoting common research and technology development projects among Member States with fast reactor and advanced fuel cycle development programmes, with the general aim of catalysing and accelerating technology advances in these fields. In particular the theme of **fast reactor deployment, scenarios and economics** has been largely debated during the recent IAEA International Conference on Fast Reactors and Related Fuel Cycles: Safe Technologies and Sustainable Scenarios, held in Paris in March 2013. Several papers presented at this conference discussed the economics of fast reactors from different national and regional perspectives, including business cases, investment scenarios, funding mechanisms and design options that offer significant capital and energy production cost reductions.

This Technical Meeting on Fast Reactors and Related Fuel Cycle Facilities with Improved Economic Characteristics addresses Member States’ expressed need for information exchange in the field, with

the aim of identifying the main open issues and launching possible initiatives to help and support Member States in solving them through international collaboration under the IAEA's aegis.

2. OBJECTIVES

The objectives of the meeting are:

- To identify the main issues and technical features that affect capital and energy production costs of fast reactors and related fuel cycle facilities;
- To present fast reactor concepts and designs with enhanced economic characteristics, as well as innovative technical solutions (components, subsystems, etc.) that have the potential to reduce the capital costs of fast reactors and related fuel cycle facilities;
- To present energy models and advanced tools for the cost assessment of innovative fast reactors and associated nuclear fuel cycles;
- To discuss the results of studies and on-going R&D activities that address cost reduction and the future economic competitiveness of fast reactors; and
- To identify research and technology development needs in the field, also in view of new IAEA initiatives to help and support Member States in improving the economic competitiveness of fast reactors and associated nuclear fuel cycles.

3. PROVISIONAL PROGRAMME

The meeting will **commence on Wednesday, 11 September 2013, at 9.30 a.m.** in **Meeting Room A0531** of the **Vienna International Centre**.

It will **adjourn on Friday, 13 September 2013, at 5.00 p.m.**

The programme of the meeting will include papers addressing the following topics:

- (i) Main factors that affect capital and energy production costs of fast reactors and related fuel cycle facilities;
- (ii) Fast reactor concepts and designs with enhanced economic characteristics;
- (iii) Results of studies and on-going R&D activities concerning innovative solutions for the reduction of capital costs of fast reactors and related fuel cycle facilities;
- (iv) Energy models and advanced tools to be used for the cost assessment of innovative fast reactors and related fuel cycles; and
- (v) Identification of research and technological gaps in the field of fast reactor economics that require new initiatives under the auspices of the IAEA.

On the last day of the meeting, a summary session (to be defined by the Scientific Secretary in consultation with the Chairman in the final agenda after acceptance of the papers) will be organized, with the responsibility for drafting:

- Preliminary summaries for the proceedings of the meeting;
- Conclusions and recommendations with regard to innovative solutions and design features to improve the economic competitiveness of fast reactors and related fuel cycles; and
- Recommendations for international collaboration under the IAEA's aegis.

4. PARTICIPATION

Participation is solicited from governmental, national and international organizations, research centres, universities, and industries. To ensure maximum effectiveness in exchanging information and providing recommendations, the participants should be persons actively involved in the subject of the meeting.

Participants should complete the attached Participation Form A as soon as possible and send it through the competent official authority (Ministry of Foreign Affairs or National Atomic Energy Authority) for subsequent transmission to the IAEA Secretariat, to arrive not later than **15 August 2013**.

The designation of a participant will be accepted only if forwarded by the Government of an IAEA Member State or by an organization invited to participate.

The meeting is, in principle, open to all officially designated persons. The IAEA, however, reserves the right to limit participation should this become necessary due to limitations imposed by the available seating capacity. It is therefore recommended that interested persons take the necessary steps to obtain their official designation as early as possible.

A preliminary meeting agenda will be sent to the participants once the completed Participation Forms have been received.

5. VENUE

The meeting will be held at the IAEA's Headquarters in Vienna, Austria, specifically in **Meeting Room A0531** of the Vienna International Centre.

6. MEETING ORGANIZATION

Official correspondence with regard to the technical aspects of the meeting should be addressed to the Scientific Secretary:

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7. SUMMARIES AND PAPERS

The Participation Form (~~see attachment~~) should be submitted through the established official channels with an indication as to whether the designated participant intends to present a paper. Participation Forms must reach the IAEA by **15 August 2013**, together with a copy of a one-page abstract of the proposed paper. The abstract will be used to select papers (based on coherence with the objectives and scope of the meeting, the novelty and significance of results, clarity of presentation, etc.) and to establish the final programme. Authors will be notified of the status of their paper by the IAEA, in due course.

The submission of a paper implies that the author intends to participate in the meeting if the paper is accepted, and to provide the Scientific Secretary, Mr Stefano Monti, with a camera-ready original of the paper for publication by the IAEA in the proceedings after the meeting. A digital version of the paper on a disk (or CD-ROM) in Microsoft Word format is desirable to facilitate editing and publication of the proceedings. All papers must present original work; they should not have been published elsewhere.

Detailed instructions for preparation of the manuscript for publication will be provided to authors upon notification of acceptance of their paper.

The time for presentation of papers will be limited to approximately 30 minutes in order to have sufficient time for discussions. A PC, a video projector and a screen for viewgraphs will be provided. Any additional equipment requirements should be noted on the attached Participation Form.

The meeting agenda will be provided to the participants sufficiently in advance of the meeting for them to plan their presentation.

8. WORKING LANGUAGE

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

9. VISAS

Designated participants who need a visa for entering Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria as early as possible.

10. EXPENDITURES

No registration fee will be charged to the participants. The costs for the organization of the meeting are to be borne by the IAEA.

The IAEA is generally not in a position to bear the travel and other costs of participants in the meeting. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Such assistance may be offered upon specific request to normally one participant per country provided that, in the IAEA's view, the participant on whose behalf assistance is requested will make an important contribution to the meeting. The application for financial support should be made at the time of designating the participant.

11. PROCEEDINGS

The proceedings of the meeting will be published by the IAEA as soon as possible after the meeting.

12. LOCAL ARRANGEMENTS

The meeting venue, hotel reservation details, and other necessary information will be sent to officially designated participants upon receipt by the IAEA of the completed Participation Forms.