



IAEA

International Atomic Energy Agency

Technical Meeting on Next Generation Reactors and Emergency Preparedness and Response

**IAEA Headquarters
Vienna, Austria**

13 – 17 February 2017

Ref. No.: J3-TM-55346

Information Sheet

A. Background

A continuously increasing interest in nuclear power has been obvious over the past years in several countries with already established nuclear power programmes, as well as in countries at various stages of preparation or initiation of a nuclear power programme. According to the *Nuclear Technology Review 2015* (IAEA document GC(59)/INF/2), the “Agency’s 2014 projections show a growth between 8% and 88% in nuclear power capacity by the year 2030”. While current nuclear power plants (NPPs) under operation, commissioning or construction are mostly water cooled thermal reactors, more than a dozen countries with advanced nuclear technology capabilities have started developing innovative nuclear reactors, which are expected to become commercially available and to be deployed in the next decades.

There are presently a number of innovative nuclear reactor concepts¹ on which research and development (R&D) work is being undertaken, and they are characterized by different design approaches, technologies and safety features, e.g.: sodium cooled fast reactors, very high temperature reactors, lead cooled fast reactors, gas cooled fast reactors, supercritical water cooled reactors, and molten salt reactors.

Although differing in individual solutions, next generation nuclear power reactor concepts will be subject to the ‘safety by design’ approach. The current IAEA safety requirements for NPP design (IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), issued in 2016) indicate that “[t]he design shall be such as to ensure that plant states that could lead to high radiation doses or to a large radioactive release have been ‘practically eliminated’, and that there would be no, or only minor, potential radiological consequences for plant states with a significant likelihood of occurrence.” Moreover, the IAEA Fundamental Safety Principles state the concept of defence in depth as the primary means of preventing and mitigating the consequences of accidents. The concept of defence in depth is implemented primarily through the combination of a number of consecutive and independent levels of protection, including the fifth level, the objective of which is to mitigate, through off-site emergency preparedness and response (EPR) measures, the radiological consequences of radioactive releases that could result from an accident.

As stated in various publications issued by R&D organizations, forums working on next generation power reactors, etc., these new generation power reactors are being designed to satisfy a broad spectrum of objectives: economic competitiveness, a high level of safety, proliferation resistance, and reduced nuclear waste streams. As described in the 2013 annual report of the Generation IV International Forum, the following safety and reliability goals have been defined for Generation IV reactors (which fall into the category of next generation reactors), namely that they should: (i) “excel in safety and reliability”; (ii) “have a very low likelihood and degree of reactor core damage”; and (iii) “eliminate the need for offsite emergency response”.

Experience accumulated over 60 years of operation of NPPs and from the response to a few severe nuclear accidents has revealed the crucial importance of off-site EPR as the ultimate level of defence in depth.

¹ For the purposes of this meeting, these will be referred to here as ‘next generation’ reactors.

While one of the design objectives for future nuclear power reactors is that the necessity for off-site protective actions to mitigate radiological consequences be limited or even eliminated in technical terms, the IAEA Fundamental Safety Principles and the concept of defence in depth should be properly addressed. Further, the IAEA safety requirements in EPR require, in relation to the hazard assessment for NPPs, the consideration of “on-site events, including those not considered in the design” (IAEA Safety Standards Series No. GSR Part 7).

Therefore, even though the developers of next generation nuclear power reactors are working to design and implement advanced solutions able to meet the ambitious design objectives, discussions need to take place on whether and to what extent there is a need for off-site EPR arrangements and capabilities for such reactors.

Answering these questions will necessitate, over the years to come, concerted efforts by experts from regulatory bodies, emergency response organizations, design and research organizations, vendors and potential operators. Analysis of the feasibility and complexity of off-site EPR arrangements and capabilities for next generation power reactor designs will need to be conducted.

B. Objectives

The purpose of the meeting is to address the use of the fifth level of defence in depth and the IAEA safety requirements in EPR for the development of next generation nuclear power reactors. In particular, the following will be addressed:

- Sharing Member States’ experiences related to the implementation of the fifth level of defence in depth and the IAEA safety requirements in EPR;
- Presenting next generation nuclear power reactor design concepts and safety features in relation to off-site emergency response;
- Presenting IAEA activities in support of next generation nuclear power reactors; and
- Sharing current EPR approaches and practices in relation to next generation nuclear power reactors.

C. Topics

The meeting will address the following topics:

1. Implementation of the fifth level of defence in depth and the IAEA safety requirements in EPR
2. Next generation nuclear power reactor design concepts and safety features
3. Relevant lessons from past emergencies
4. EPR and next generation nuclear power reactors

D. Structure

The meeting will be held at the IAEA's Headquarters in Vienna, Austria, from 13 to 17 February 2017.

The technical sessions will consist of keynote lectures and presentations delivered by invited speakers and representatives from IAEA Member States, the IAEA Secretariat and other organizations (including designers and operators), and will focus on the topics described in Section C above.

Designated experts from IAEA Member States are encouraged to give a presentation during the meeting. Those experts must submit their work in the form of a one page abstract relevant to the objectives of the meeting. This abstract should be submitted together with a completed Form for Submission of an Abstract (Form B) and Participation Form (Form A) to the competent authority for subsequent electronic transmission to the IAEA Secretariat (see Section L below). Authors are urged to make use of the 'Abstract Template' available on the meeting web page.

In order to provide ample time for discussion, the number of abstracts that can be accepted for oral presentation is limited. If the number of relevant and high quality abstracts submitted for selection exceeds the acceptable number, some of them may be selected for poster presentation instead.

Authors will be informed as to whether their abstracts have been accepted for oral or poster presentation. The presentation or poster should be submitted by the deadline indicated in Section K below.

The IAEA reserves the right to exclude abstracts that do not comply with the IAEA's quality standards and/or do not apply to any of the objectives of the meeting.

The keynote lectures and presentations will be followed by discussions with invited speakers and participants.

Summaries of discussions and concluding remarks will be presented at the closing plenary session.

E. Participation

The meeting is intended primarily for EPR managers, NPP operators, representatives of regulatory bodies, technical and scientific support organizations and disaster management organizations; emergency planners and decision-makers) from all Member States, and in particular from those Member States considering next generation nuclear power reactors as part of their future sustainable energy mix. It is also intended for next generation nuclear power reactor designers and potential operators, as well as representatives of R&D institutes, who need to be involved at an early stage in the dialogue on the impact on their design of the correct understanding of defence in depth levels for protection of the public.

All Member States and relevant international organizations (i.e. those participating in the Inter-Agency Committee on Radiological and Nuclear Emergencies) are invited to participate in this meeting.

F. Application Procedure

The Secretariat would appreciate receiving designations for participation in this meeting by **1 December 2016**. For designations please use the attached Participation Form.

Designations should be submitted through the established official channels for the attention of the Scientific Secretary of the meeting, Mr Ramón De La Vega, Incident and Emergency Centre, Department of Nuclear Safety and Security, IAEA, Vienna International Centre, PO Box 100, 1400 Vienna, Austria (Tel.: +43 1 2600 21423; Fax: +43 1 26007; Email: R.I.De-La-Vega@iaea.org). Designations should also be copied to the Administrative Secretary for the meeting, Ms Velina Bojkova (Email: V.Bojkova@iaea.org). The full names and complete contact details (including postal address, telephone/fax numbers, and email address) of designated participants should be provided.

Designating Governments will be informed in due course of the names of the selected candidates and will at that time be given full details on the procedures to be followed with regard to administrative and financial matters.

G. Visas

Designated participants who require a visa to enter Austria (a Schengen State) should submit the necessary application to the nearest diplomatic or consular representative of Austria in their home country as soon as possible. Persons who require a visa have to apply for a Schengen visa at least 21 days before entry into Austria. 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.

H. Expenditure

The costs for the organization of the meeting will be borne by the IAEA. 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 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 (see the attached Participation Form).

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 meetings, workshops or training courses or for consultants. 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.

I. Working Language

The working language of the meeting will be English.

J. Meeting Web Page

Please visit the IAEA Meetings website regularly for new information regarding this event, at the following web address:

<http://www-pub.iaea.org/iaeameetings/>

An annotated programme will be made available on the meeting web page in due course.

K. Key Dates

- 10 October 2016: Opening for designations
- 11 November 2016: Deadline for submission of designations for participation (Forms A and B)
- 02 December 2016: Participants informed about acceptance of abstracts
- 13 January 2017: Deadline for electronic submission of presentations/posters
- 13 February 2017: Technical Meeting starts
- 17 February 2017: Technical Meeting concludes

L. Secretariat

IAEA Scientific Secretaries:

Mr Ramón DE LA VEGA

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INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Vienna International Centre,
PO Box 100, 1400 VIENNA, AUSTRIA

**Technical Meeting on Next Generation Reactors and
Emergency Preparedness and Response**

**IAEA Headquarters, Vienna, Austria
13–17 February 2017**

The Government (designating authority) of: _____ (country)

designates the person indicated below for the following event:

Technical Meeting on Next Generation Reactors and Emergency Preparedness and Response,
IAEA Headquarters, Vienna, Austria, 13–17 February 2017

Ms Mr

First name: _____ Family name: _____

Name of organization: _____

Full address: _____

Tel.: _____ Fax: _____ Email: _____

Financial support requested

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To be sent by **1 December 2016** through the Ministry of Foreign Affairs or Permanent Mission to the IAEA to Mr Ramón De La Vega by email: R.I.De-La-Vega@iaea.org or by fax to: +43 1 26007, with a copy to Ms Velina Bojkova (Email: V.Bojkova@iaea.org).

Form B
J3-TM-55346

Form for Submission of an Abstract

Technical Meeting on Next Generation Reactors and Emergency Preparedness and Response

IAEA Headquarters, Vienna, Austria
13–17 February 2017

To be completed by the participant and sent to the competent 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), Vienna International Centre, PO Box 100, 1400 Vienna, Austria, either electronically by email to R.I.De-La-Vega@iaea.org or by fax to: +43 1 26007 (no hard copies needed), with a copy to: V.Bojkova@iaea.org.

Deadline for receipt by IAEA through official channels: 1 December 2016

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| Title of the abstract: | | |
| Family name(s) and initial(s) of author(s) | Scientific establishment(s) in which the work has been carried out | City/Country |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| Family name of author who will present the paper | Mailing address: | |
| Initial(s): | | |
| Mr/Ms | | |
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