



# **Technical Meeting on Challenges and Opportunities in the Construction Management of Advanced Nuclear Power Plants**

**Hosted by the**

**Government of China**

**through the**

**Shanghai Nuclear Engineering Research and Design Institute (SNERDI)**

**Shanghai, China**

**28–31 August 2018**

**Ref. No.: EVT1701781**

## **Information Sheet**

### **A. Background**

In the past, several nuclear power plant (NPP) construction projects encountered challenges related to construction quality, schedule and cost. This clearly impacts the economic case for new nuclear power projects when compared with other forms of electric power generation. These challenges are considered to be partly due to organizations' lack of understanding of the special requirements for NPP construction. Although contractual arrangements and organizational responsibilities for current nuclear construction projects may differ from what they were in the past, the requirements must still be carefully addressed to

ensure an appropriate construction infrastructure and a quality assurance programme for the construction.

The nuclear business environment for vendors has changed significantly since the 1970s, especially in Western Europe and North America, and owner/operator countries are increasingly requesting manufacturing and construction often from companies that have no nuclear experience and have limited capability to provide quality. The following are some of the reasons for delays and cost increases in the construction of advanced NPPs:

- First-of-a-kind project;
- Inadequate design;
- Increasing component sizes;
- New instrumentation and control technology;
- New manufacturing technology;
- New types of components;
- New business models in the industry;
- Vendor overlooking customer and regulatory body expectations;
- Inexperienced owners or regulators; and
- Counterfeit components in the supply chain.

The construction of advanced NPPs should therefore be focused on creating the conditions to facilitate the establishment of adequate infrastructure. To avoid delays in the early stages of the project, all of this should be done before the start of the construction phase.

Some excellent new NPPs have been constructed based on the experience of existing reactors around the world. The readiness for deployment of new NPP construction projects varies from design to design, based primarily on the degree of design completion, the status of regulatory approval, and project management skill and competence.

The International Atomic Energy Agency (IAEA) has in recent years developed a review service for Member States<sup>1</sup> to help identify readiness for the construction phase, and has produced guides in the IAEA Nuclear Energy Series related to construction technology<sup>2</sup> and financing<sup>3,4</sup> that in some part address construction related challenges. The IAEA safety standards emphasize the need to analyse each construction site for “site specific risks and for construction method risks”.<sup>5</sup>

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<sup>1</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, CORR Guidelines: Preparing and Conducting Review Missions of Construction Project Readiness for Nuclear Power Plants, IAEA Services Series No. 24, IAEA Services Series IAEA-SVS-24, IAEA, Vienna (2013)

<sup>2</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, Construction Technologies for Nuclear Power Plants, IAEA Nuclear Energy Series No. NP-T-2.5, IAEA, Vienna (2011)

<sup>3</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, Financing of New Nuclear Power Plants, IAEA Nuclear Energy Series No. NG-T-4.2, IAEA, Vienna (2008)

<sup>4</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, Issues to Improve the Prospects of Financing Nuclear Power Plants, IAEA Nuclear Energy Series No. NG-T-4.1, IAEA, Vienna (2009)

<sup>5</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, Construction for Nuclear Installations, IAEA Safety Standards Series No. SSG-38, IAEA, Vienna (2015)

## B. Objectives

The purpose of the meeting is to explore and provide practical guidance on various aspects of recent NPP construction projects, and to share good practices among the participating Member States. It will highlight the importance of having appropriate project management strategies, especially taking into consideration the various organizational arrangements that exist in different construction and operating organizations and countries.

Specifically, the meeting will aim to:

- Share experiences and lessons learned in addressing challenges and opportunities associated with advanced NPP construction management; and
- Collect information from Member States for use in developing a draft IAEA technical document on challenges and opportunities in advanced NPP construction, reflecting changes in industry structure and markets, and focusing on strategies and solutions to avoid construction risks.

## C. Topics

The meeting will include presentations by participants from Member States, international organizations and the IAEA Secretariat. Presentations will be given on the following topics and on experiences and lessons learned in relation to construction management for preparation and construction/commissioning of NPPs:

- Project management, and oversight of construction activities;
- Site specific engineering/construction planning;
- Control over supply chain development;
- Knowledge and skills relevant to advanced construction management and technologies;
- Comprehensive configuration management;
- Skilled workers and technicians;
- Verification of equipment installation;
- Maintenance of a safe work environment;
- Tools, software and techniques used for construction management in different environments;
- Common risk areas for NPP construction projects;
- Specific practices for NPP construction risk management; and
- Recommended good practices.

## D. Target Audience

The meeting is targeted at Member State representatives who are involved in the construction or refurbishment of nuclear facilities. These might include individuals who deal with managing, overseeing, regulating, designing, financing, insuring, risk managing, or otherwise implementing new-build construction programmes or refurbishment projects. Suppliers of tools applicable to risk management for nuclear construction and academics whose research focuses on construction project management are also encouraged to participate.

## E. Working Language

English

## F. Application Procedure

Designations should be submitted using the attached **Participation Form (Form A)**. Completed requests should be endorsed by the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority), or by an organization invited to participate, and returned through the established official channels. They must be received by the IAEA not later than **8 June 2018**. Designations received after that date or applications sent directly by individuals or by private institutions cannot be considered. 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. Designating Governments and invited organizations will be informed in due course of the names of the selected candidates and at that time full details will be given of the procedures to be followed with regard to administrative and financial matters.

## G. Papers

No formal papers will be required for this meeting. However, participants will be expected to:

- Give a summary presentation on current processes, standards and experiences (including significant events) related to nuclear facility construction or related to large nuclear refurbishment projects within their country or organization;
- Actively participate in the dialogue at the meeting; and
- Provide any other input useful to the IAEA's activities on this topic.

## H. 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 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 **up to two** participants per country provided that, in the IAEA's view, the participant(s) 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(s). If Governments wish to apply for a grant on behalf of one of their experts, they should address specific requests to the IAEA to this effect. Governments should ensure that applications for grants are submitted by **8 June 2018** using a signed **Grant Application Form (Form C)**. Approved grants will be issued in the form of a lump sum payment that usually covers **only part of the cost of attendance**.

## I. Visas

Participants who require a visa to enter China should submit the necessary application to the nearest diplomatic or consular representative of China as soon as possible.

## J. Local Arrangements

The meeting will be held at the Shanghai Nuclear Engineering Research and Design Institute (SNERDI) in Shanghai, China, and will start at 9:30 a.m. on Tuesday, 28 August 2018, and end at 14:00 on Friday, 31 August 2018.

The meeting agenda and local details, together with information on local arrangements, will be sent to participants at a later stage.

## K. Organization

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