IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on Costing Approaches for Nuclear Technology Developers

EVT1804759

March 26–28, 2019

Meeting Room C1

IAEA Headquarters
Vienna, Austria

Information Sheet

Introduction

Generation III and III+ reactors are currently being built to replace existing nuclear power plants constructed 30–60 years ago (Generation I and II reactors) or to expand existing fleets. Simultaneously, an intense research and development effort is being deployed in a number of countries to optimize first-of-a-kind Generation III+ reactors — many of them currently under construction —, to develop Small Modular Reactors (SMRs), and to explore the potential of future revolutionary reactors (Generation IV reactors).

SMRs provide a low carbon alternative to fossil fuel powered electricity generation systems, particularly in countries with small power grids and limited financing capabilities. SMRs may additionally support non-electric applications, such as seawater desalination and district heating, and provide 'grid services' in an electric system with increasing levels of variable renewable energy. Around 50 SMR designs are currently being developed for near-term deployment and three are being constructed.

Many Generation IV concepts being investigated are fast neutron reactors. These reactors can operate in 'breeder mode' or in 'burner mode', reducing the need for uranium mining and enrichment and, potentially, the volume of high-level radioactive waste to dispose of. In addition to fast reactors, Generation IV designs also include molten salt reactors, supercritical water cooled reactors, and very high temperature reactors.

For SMRs, as for Generation IV concepts, much work is yet to be accomplished by reactor designers, national authorities, including the nuclear regulators, and electric utilities to address various technical, safety, regulatory and broad economic issues.

A Member State's decision to develop and deploy new technologies for nuclear power generation often requires a strong economic justification. In fact, there have been multiple requests from Member States for IAEA assistance toward sharing best practices in the areas of nuclear project planning and scheduling, cost estimation and analysis, financial valuation and economic appraisal, including for reactor concepts under development. These requests were raised in particular during the annual workshops on the exchange of experience among energy system planners using the Planning and Economic Studies Section's models and supporting tools, during Reactor Technology Assessment workshops and during recent Technical Meetings (TM), e.g., the TM held in April 2018 to discuss 'nuclear power cost estimation and analysis methodologies'. To address Member States' needs in terms of approaches for cost estimation and analysis, the IAEA initiated, in 2017, the Nuclear Cost Basis project, which aims at providing a set of principles, standards, and general guidelines for developing consistent cost estimates, taking uncertainties and the conditions prevailing at the country level into account. Project outputs include a Nuclear Energy Series publication on cost estimation and analysis approaches for nuclear power projects and programmes and a technical-economic information database. These resources are developed primarily through consultancies, Technical Meetings and coordinated research activities, based on input from Member States.

The Technical Meeting on Costing Approaches for Nuclear Technology Developers is aimed at technology developers in Member States — governmental, academic, research industrial actors — pursuing active research and development into innovative concepts of nuclear power plants, including SMRs and Generation IV designs. The event will focus on methodologies for project planning, cost estimation and analysis, financial valuation, and economic appraisal, as well as different approaches for dealing with the risks and uncertainties related to advanced concepts currently under development. The information collected during this Technical Meeting will be compiled, structured, developed and made available as part of the Nuclear Energy Series publication, and the technical-economic information database will be developed in the context of the Nuclear Cost Basis project.

Objectives

The Technical Meeting brings together nuclear technology developers and end-users in Member States to discuss general technical-economic, cost, financial, competitiveness, and broad economic issues related to emerging reactor concepts, including SMRs, and best practices for project planning, cost estimation and analysis, and economic appraisal under uncertainty.

The Technical Meeting's topics include:

- Expenditures and delivery times related to the pre-construction, construction, and operation of innovative reactor concepts;
- Design options, technological innovations and new construction techniques, and their effect on costs;
- Identification and ranking of factors affecting capital, operation and maintenance, fuel, and lifetime costs (broad context; technology, design and operating variables; system boundaries; project management and execution approaches, etc.);
- New reactor projects' cost drivers, and cost (and schedule) reduction and optimization strategies;
- Integration with other power generation technologies, and external processes (cogeneration), and its effect on costs, revenues, and economic competitiveness;
- Business models and approaches for financial valuation and economic appraisal; and
- Dealing with risks and uncertainties related to the development and deployment of emerging reactor concepts.

The purpose of the event is to focus on cost estimation and analysis methodologies and their applications, and different approaches for dealing with the risks and uncertainties related to advanced concepts of nuclear power plants currently under development.

Participants, from both newcomer countries and established Member States, are invited to share their perspectives and provide country-specific examples and case studies. Keynote speakers, with direct experience in planning and implementing innovative reactor projects, will highlight their own perspectives, challenges and lessons learned.

Target Audience

The event is open to representatives of nuclear power organizations, and economic and financial institutions from Member States developing or considering new concepts of nuclear power plants, including SMRs. Participants should be knowledgeable about their country's national strategy and specific plans for nuclear power project development and implementation, and willing to share their experience and lessons learned in estimating and analysing the costs related to their nuclear projects and programmes, and in assessing their broad economics and competitiveness.

Working Language

English. All communications, working papers and presentations must be submitted in this language.

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.

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.

IAEA Contacts

Scientific Secretary:

Mr Saied Dardour
Planning and Economic Studies Section
Division of Planning, Information and Knowledge Management
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 260025154
Fax: +43 1 26007
Email: S.Dardour@iaea.org

Administrative Secretaries:

Ms Valerie Gartner
Planning and Economic Studies Section
Division of Planning, Information and Knowledge Management
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 260022778
Fax: +43 1 26007
Email: V.Gartner@iaea.org

Ms Eugenie Hartzell
Planning and Economic Studies Section
Division of Planning, Information and Knowledge Management
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 VIENNA
AUSTRIA

Tel.: +43 1 260022779
Fax: +43 1 26007Email: E.T.B.Hartzell@iaea.org

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