IAEA
International Atomic Energy Agency
Atoms for Peace

Technical Meeting on Nuclear Power Cost Estimation and Analysis Methodologies

Hosted by the
International Atomic Energy Agency

IAEA Headquarters
Vienna, Austria

24–26 April 2018

Ref. No.: EVT1703808

Information Sheet

A. Background

Access to relevant, up-to-date cost information on nuclear power plants (NPPs) is a key step for decision-making. This is particularly true for International Atomic Energy Agency (IAEA) Member States considering the introduction of a nuclear power programme. There have been multiple requests from Member

States, especially nuclear newcomer countries, for the sharing of best practices in the cost estimation of nuclear infrastructure development and NPP construction projects. These requests have been made, in particular, during the annual workshops on the exchange of experience among energy system planners who use models developed by the IAEA's Planning and Economic Studies Section[1] and supporting tools[2].

Nuclear power projects are characterized by large capital investments, vast complexity and long-lasting macroeconomic and social impacts. Estimating the costs — and delivery times — attached to such 'megaprojects' is a crucial step in technology and policy assessments, and a key input for a number of important studies covering:

- Feasibility, investability, and bankability of nuclear power projects and programmes; and
- Macroeconomic and social impacts assessments.

This **Technical Meeting on Nuclear Power Cost Estimation and Analysis Methodologies** is focused on prospective capital and operating expenditures associated with pre-construction, construction[3], and operation of new, commercial-scale NPPs, including first-of-a-kind concepts. Estimating, and comparing, the costs attached to such projects and activities, identifying their drivers, and exploring ways to reduce them, are the main topics to be discussed during this meeting.

B. Objectives

The meeting will bring together nuclear technology developers and owner/operator organizations to discuss general cost issues associated with new NPP construction projects, as well as best practices for cost estimation and cost management. The main purpose of the meeting is to facilitate the exchange of information on these topics of interest to senior managers, analysts, planners and those otherwise involved in nuclear power cost estimation in Member States. The information collected during this meeting will be compiled, structured, developed further and made available to Member States as (part of) a publication: the *Nuclear Cost Basis* report (see the Appendix).

General cost issues include:

- Expenditures and delivery times attached to the pre-construction, construction, and operation of new NPPs.
- Factors affecting costs:
    - Contracting mechanism and strategy;
    - Technology, design and operating variables, system boundaries;
    - Equipment supplier and localization;
    - Project management and execution approaches.

[1] See https://www.iaea.org/OurWork/ST/NE/Pess for more information.
[2] For example, energy planning tools such as WASP ('Wien Automatic System Planning Package'), MESSAGE ('Model for Energy Supply Alternatives and their General Environmental Impacts') and FINPLAN ('Model for Financial Analysis of Electric Sector Expansion Plans').
[3] Cf. the IAEA's 'Project Management' publication [1]. This report provides guidance on project management from the preparatory phase to plant turnover to commissioning of NPPs.

- Nuclear new-build projects:
    - Cost data and cost ranges;
    - Cost drivers;
    - Cost (and schedule) reduction and optimization strategies.

Cost estimation and analysis methodologies include:

- Costing and cost analysis techniques and their applications;
- Methodologies for nuclear power project planning, costing, valuation and comparison;
- Practices for accounting for uncertainties, risks, and other considerations attached to the local context;
- Approaches for managing costs and cost estimates throughout the life cycle of a nuclear power project or programme.

Meeting participants, from both newcomer countries and Member States with established nuclear power programmes, are invited: to share their perspectives on how to develop, update, document and communicate cost estimates; to provide country-specific examples and case studies illustrating the process; and to express their needs, expectations, and requirements in terms of basic techno-economic input data, and cost estimation approaches. Keynote speakers, with direct experience in implementing NPP construction projects, will highlight their own perspectives, challenges faced and lessons learned.

The IAEA will present its project for the development of a *Nuclear Cost Basis* (NCB) report (see the Appendix). The NCB report aims at providing Member States with a framework for estimating the costs related to their nuclear power projects on a consistent basis, and for understanding the drivers of costs. The report is intended to cover a wide range of applications of interest of Member States — from infrastructure development, through NPP construction, to retirement and decontamination and decommissioning. Based on ideas, comments and suggestions from meeting participants, the main steps for future development of the NCB will be determined.

C. Target Audience

The meeting is open to representatives of nuclear power organizations from Member States considering planning, or expending, a nuclear power programme:

- Government:
    - Policymakers
    - Analysts
    - Research and development agencies
- Industry:
    - Vendors
    - Engineering firms
    - Plant operators

Participants should be knowledgeable about the details of their country's national strategy and specific plans for nuclear power implementation, and willing to share their experience and lessons learned in estimating the costs attached to their nuclear projects and programmes.

D. Working Language

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

E. Venue

The Meeting will be held from 24 to 26 April 2018 at the IAEA's Headquarters in Vienna, Austria, specifically in Room M0E75, Building M, of the Vienna International Centre (VIC).

F. Visas

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.

G. Organization

Official correspondence with regard to technical aspects of the meeting should be addressed to the Scientific Secretaries, Mr Saied Dardour and Mr Ki-Sig Kang:

Mr Saied Dardour
Planning and Economic Studies Section
Division of Planning, Information and Knowledge Management
Department of Nuclear Energy
International Atomic Energy Agency
Tel.: +43 1 2600 25154
Email: S.Dardour@iaea.org

Mr Ki-Sig Kang
Nuclear Power Engineering Section
Division of Nuclear Power
Department of Nuclear Energy
International Atomic Energy Agency
Tel.: +43 1 2600 22796
Email: K.S.Kang@iaea.org

Official correspondence with regard to administrative issues should be addressed to:

Ms Maide Bardhi
Planning and Economic Studies Section
Division of Planning, Information and Knowledge Management
Department of Nuclear Energy
International Atomic Energy Agency
Tel.: +43 1 2600 22778
Email: M.Bardhi@iaea.org

Appendix

References

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Project Management in Nuclear Power Plant Construction: Guidelines and Experience, IAEA Nuclear Energy Series No. NP-T-2.7, IAEA, Vienna (2012).

IAEA's Nuclear Cost Basis Project

The *Nuclear Cost Basis* (NCB) report aims at providing Member States with a basis for developing consistent, comprehensible, reproducible, engineering cost estimates, taking into account their projects' specificities, uncertainties, risks, and the conditions prevailing at the country level.

The NCB report aims to address the needs, expectations, and requirements of different 'segments' of Member States:

- Nuclear newcomers: their focus is primarily on infrastructure development and on the construction (and operation) of their first nuclear power plant (NPP).
- Countries with operating NPPs that are considering:
    - Optimization of the operation and the economics of their NPPs and nuclear fuel cycle (NFC) facilities;
    - Upgrades and long term operation of their operating NPPs;
    - Expansion of their NPP fleet with new builds;
    - Retirement, decontamination, and dismantling of nuclear facilities.
- Technology developers, governmental, academic, research and industrial actors pursuing active research and development on innovative concepts of NPPs, advanced NFC options, and solutions for radioactive waste disposal.

The NCB report will be structured around three parts: an "Introductory Part", a "Nuclear Power Costs Estimating Canvas", and a "Nuclear Power Costs Database":

- The introductory part provides a general introduction to nuclear power costs, cost reduction and optimization challenges, and cost estimation and management approaches.
- The second part suggests a methodology for developing consistent, comprehensible and reproducible cost estimates, taking into account the specificities of nuclear projects and programmes, and the conditions prevailing at the local level. Case studies, based on the application of the 'canvas' and illustrating its practical application will be added at a later stage.
- The third part compiles relevant, up-to-date techno-economic input from peer reviewed sources of information.

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Form A
EVT1703808

Participation Form

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To be completed by the participant and sent to the competent official 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: Official.Mail@iaea.org and M.Bardhi@iaea.org or by fax to: +43 1 26007 (no hard copies needed).

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

Deadline for receipt by IAEA through official channels: 15 February 2018

Family name: (e.g. Smith)	First name(s): (e.g. John)	Mr/Ms
Institution:		
Full address:		
For urgent communications please indicate:	Tel.: Fax: Email:	
Nationality:	Designating Government or organization:	
Mailing address (if different from address indicated above):		
Do you intend to submit a paper?	Yes ☐	No ☐
Would you prefer to present your paper as a poster?	Yes ☐	No ☐
Title:		