IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on Equipment Qualification for Design Extension Conditions in Nuclear Power Plants

IAEA Headquarters
Vienna, Austria

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Information Sheet

Introduction

Equipment qualification is required to ensure that equipment will be capable of performing its intended safety functions reliably under the range of service conditions for which it is needed.

IAEA Specific Safety Guide No. SSG-69 "Equipment Qualification for Nuclear Installations", published in 2021, provides recommendations on a structured approach to the establishment and preservation of equipment qualification in nuclear installations to meet the relevant requirements established in Specific Safety Requirements SSR-2/1(Rev.1) "Safety of Nuclear Power Plants: Design" and SSR-2/2(Rev.1) "Safety of Nuclear Power Plants: Commissioning and Operation".

SSG-69 states that "equipment qualification is required to demonstrate that the equipment will be capable of performing its intended safety function under the range of service conditions specified for the nuclear installation in operational states and accident conditions [1]". In addition, in paragraphs 4.57 to 4.62 of this safety guide, recommendations related to the assessment of equipment capability for design extension conditions with core melting are discussed.

Ensuring the functionality and reliability of the equipment necessary for design extension conditions, is essential. However, due to the harsh environmental conditions associated with those accident scenarios,

[1] According to IAEA Specific Safety Requirements SSR-2/1(Rev.1) Requirement 13 (Categories of plant states) "Plant states shall typically cover: (a) Normal operation; (b) Anticipated operational occurrences, which are expected to occur over the operating lifetime of the plant; (c) Design basis accidents; (d) Design extension conditions, including accidents with core melting."

equipment qualification for those conditions can be very challenging and complex. Indeed, multiple factors need to be considered, such as core melting conditions, possible long mission times required for equipment in post accidents periods, and cases of multiple functional requirements for some specific equipment. Further, limitations may exist for manufacturing the equipment that is required to reliably operate in such conditions.

Member States adopt different approaches to justify the performance of equipment under the conditions in such accident scenarios; some use survivability assessments to evaluate the ability of the equipment and instrumentation used during a severe accident to survive and deliver their intended functions in the harsh containment environment, and some others favour qualification of equipment for those conditions.

IAEA is conducting further work to reach a common understanding on the best practices to demonstrate the capability of equipment to perform the safety functions in design extension conditions, and to obtain a systematic compilation of good practices in equipment qualification for design extension conditions (including approaches and methods).

By examining the experiences and lessons learnt from different Member States on these important matters, valuable insights can be gathered to enhance the overall approach to equipment qualification for design extension conditions.

Objectives

The objective of this event is to facilitate the exchange of information among Member States concerning practices, experiences, and challenges related to equipment qualification for design extension conditions in Nuclear Power Plants.

The International Atomic Energy Agency (IAEA) is planning to develop a new publication (TECDOC) entitled "Safety Aspects of Equipment Qualification for Design Extension Conditions in Nuclear Power Plants." The event aims to gather feedback and comments from Member States on an early draft of this publication. In addition, the event will contribute to the ongoing development of this TECDOC.

Target Audience

Participation is targeted at professionals from Nuclear Power Plant (NPP) designers, operating organizations, regulatory bodies, and technical support organizations who have specialized knowledge of, or experience in equipment qualification for NPPs. To ensure maximum effectiveness in the exchange of information, participants should be actively involved in the subject areas of the meeting.

The event is in principle open to all officially designated persons. The IAEA, however, reserves the right to restrict participation due to limitations imposed by the available meeting facilities. It is, therefore, recommended that interest persons take the necessary steps for the official designation as early as possible.

Working Language(s)

The working language of the event will be English. No simultaneous interpretation will be provided.

Topics

Participants are invited to share their experiences at the event and give presentations on the current practices, experiences and lessons learnt on equipment qualification and survivability assessment for design extension conditions in nuclear power plants. The programme is intended to cover the following topics:

- Methods and approaches for identifying the safety functions to be delivered by equipment claimed for design extension conditions;
- Definition of the scope of equipment subject to be qualified for design extension conditions (i.e. including mechanical equipment, I&C and electrical equipment and non-permanent equipment) and identification of equipment location;
- Determination of design inputs for equipment qualification, such as mission times, service conditions (including environmental conditions and operating conditions), ageing effects and acceptance criteria;
- Methods and approaches to demonstrate the capability of equipment to perform its safety functions in design extension conditions;
- Practices in equipment qualification for design extension conditions;
- Evaluation of equipment qualification results, identification of alternative measures and equipment qualified life;
- Preservation of equipment qualification for design extension conditions.

Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **23 February 2024**. Participants who are members of an organization invited to attend are requested to send the **Participation Form (Form A)** through their organization to the IAEA by above deadline.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the Agency's Personal Data and Privacy Policy and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the

latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above.

Participants who wish to submit papers and provide presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should extend to no more than 2 pages (including figures and tables) and should not exceed 500 words. It should be sent electronically to the Scientific Secretary of the event, Ms Man Liu (Email: M.Liu@iaea.org), not later than **23 February 2024.**

Authors will be notified of the acceptance of their proposed presentations by **26 March 2024**. They will then be requested to prepare and submit their presentations in Microsoft PowerPoint or as a PDF file by email to the Scientific Secretary of the event, Ms Man Liu (Email: M.Liu@iaea.org) by **12 April 2024**.

In addition, participants have to submit the abstract together with the **Participation Form (Form A**) to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or their organization for onward transmission to the IAEA not later than **23 February 2024.**

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 event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)** which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **23 February 2024**.

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: https://www.iaea.org/events.

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.

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

Event Web Page

Please visit the following IAEA web page regularly for new information regarding this event:

https://www.iaea.org/events/evt2303764