



Technical Meeting on the Deterministic Safety Analysis of Operational States and Accident Conditions at Nuclear Power Plants (Revision of the Safety Reports Series No. 23)

IAEA Headquarters, Vienna, Austria

and virtual participation via Microsoft Teams

30 September – 03 October 2025

Ref. No.: EVT2400708

Information Sheet

Introduction

Since the publication of Safety Reports Series No. 23 on Accident Analysis for Nuclear Power Plants (NPPs) in 2002, several major safety standards have been issued, and later revised by the IAEA, particularly to account for the lessons learned from the Fukushima Daiichi NPP accidents. These standards include a set of new requirements related to safety assessment and safety analysis in GSR Part 4 (Rev. 1) (e.g. paras 4.5, 4.13–4.17 under Requirement 4) and SSR-2/1 (Rev. 1) (e.g. under Requirement 10), which are completed by recommendations through various safety guides.

Moreover, the methods for accident analysis have significantly evolved over the past two decades in several aspects. These evolutions include a better understanding of physical phenomena, the integration of research results into models, the development of computing capabilities, and the use of more sophisticated and mature models and codes, allowing a wider use of computational fluid dynamics and coupling. Additionally, uncertainty quantification has progressed in different areas, benefiting the safety analysis of nuclear reactors.

Lastly, the advent of evolutionary and innovative reactor designs has raised new issues and challenges to be addressed by deterministic safety analyses (DSA), including those related to the broader use of passive systems. In addition, a review of the applicability of the IAEA Safety Standards to non-water-cooled reactors and small

modular reactors (SMRs) is presented in Safety Reports Series No. 123 (2023). It concludes that, in general, safety assessment approaches and techniques that are used for current (water-cooled) reactors are applicable for SMRs and innovative reactors. However, the review also identified the need for additional guidance on safety analysis, including the DSA.

Objectives

The purpose of the meeting is to bring together designers, licensees, operators, and regulators to share information on current good practices, experiences, and new developments around performing DSA. This will cover all steps in performing the analyses, i.e. identification of initiating events, analysis methodology, acceptance criteria, selection of computer codes including their demonstration of code applicability and verification and validation (V&V), preparation of input data (e.g., plant parameters and modeling assumptions), assessment of uncertainties, and presentation of the analysis results.

The discussions during this Technical Meeting will provide inputs for the revision of the Safety Reports Series No. 23 (published in 2002), addressing the evolution of DSA over the last two decades. With an expanded scope to cover operational states and accident conditions, it will address the mature technologies and evolutionary and innovative reactor designs commensurately with the information available. It will ensure consistency with relevant IAEA safety standards published in the last few years, especially with [GSR Part 4 \(Rev. 1\)](#), [SSR-2/1 \(Rev. 1\)](#), [SSG-2 \(Rev. 1\)](#) and [SSG-88](#).

Target Audience

The event is open to representatives of nuclear power organizations from Member States with an active nuclear power programme, including from embarking countries that have undertaken activities to implement their first nuclear power plant, and Member States with extensive expertise in the topics covered by the event. It includes government organizations (analysts, regulatory bodies and research and development agencies), and industry (designers, vendors, engineering companies, plant operators and technology developers).

Working Language(s)

English.

Expected Outputs

The expected outputs of this event are 1) provision of support to Member States in understanding the proper implementation of deterministic safety analysis, 2) provision of assistance to Member States in developing a

comprehensive framework to perform deterministic safety analysis for existing Nuclear Power Plants (NPPs) and applications for advanced reactors, including evolutionary reactors, innovative reactors and SMRs, and 3) compilation of inputs from experienced practitioners in the area.

The outcomes from this meeting will provide inputs to a Safety Report compiling authoritative information from Member States on deterministic safety analysis of operational states and accident conditions at nuclear power plants (revision of the Safety Reports Series No. 23). The insights gained from the technical meeting will be considered for future review of relevant safety standards and technical review services offered by the IAEA.

Topics

The event will address aspects related to the DSA for NPPs including:

- Identification, categorization and grouping of Postulated Initiating Events (PIEs for anticipated operational occurrences and accident conditions).
- Acceptance criteria.
- Analysis approaches: conservative, best-estimate (realistic), combined, BEPU (best-estimate plus uncertainties) approaches.
- Types of analyses: design analysis, licensing analysis, validation of plant simulators, support for accident management and emergency planning including validation of emergency operating procedures and guidelines, analysis related to probabilistic safety assessment, analysis of operational events, regulatory oversight.
- Computer codes: selection and use of computer codes, process management, verification and validation (V&V), qualification of input data, documentation of computer codes.
- Preparation of input data for DSA.
- DSA for operational plant states and accident conditions.
- DSA in support of practical elimination of sequences that might lead to early or large radioactive releases.
- User effects.
- Treatment and evaluation of uncertainties.
- Presentation and evaluation of DSA results.

Participation and Registration

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

In order to be designated to be designated by an IAEA Member State or invited organization, participants are requested to submit their application via the InTouch+ platform (<https://intouchplus.iaea.org>) to the competent national authority (Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy

Authority) or organization for onward transmission to the IAEA by **30 June 2025**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (<https://intouchplus.iaea.org>):

- Persons with an existing NUCLEUS account can sign in to the platform with their username and password;
- Persons without an existing NUCLEUS account can register [here](#).

2. Once signed in, prospective participants can use the InTouch+ platform to:

- Complete or update their personal details under ‘Complete Profile’ and upload the relevant supporting documents;
- Search for the relevant event under the ‘My Eligible Events’ tab;
- Select the Member State or invited organization they want to represent from the drop-down menu entitled ‘Designating Authority’ (if an invited organization is not listed, please contact InTouchPlus.Contact-Point@iaea.org);
- If applicable, indicate whether financial support is requested and complete the relevant information (this is not applicable to participants from invited organizations);
- Based on the data input, the InTouch+ platform will automatically generate the Participation Form (Form A) and/or the Grant Application Form (Form C);
- Submit their application.

Once submitted through the InTouch+ platform, the application, together with the auto-generated form(s), will be transmitted automatically to the required authority for approval. If approved, the application, together with the applicable form(s), will automatically be sent to the IAEA through the online platform.

NOTE: The application for financial support should be made, together with the submission of the application, by **30 June 2025**.

For additional information on how to apply for an event, please refer to the [InTouch+ Help](#) page. Any other issues or queries related to InTouch+ can be sent to InTouchPlus.Contact-Point@iaea.org.

Selected participants will be informed in due course on the procedures to be followed regarding 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. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

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 give 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 Ms Tania Veneau, copying Mr Paulo Sales Barbosa (see contact details below), no later than **30 June 2025**. Authors will be notified of the acceptance of their proposed presentations by **31 July 2025**.

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 available to help cover the attendance costs 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, together with the submission of the application, by **30 June 2025**.

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: 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 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

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary and correspondence on other matters related to the event should be sent 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/evt2400708>