



# **Technical Meeting on Safety Considerations in the Use of Artificial Intelligence in Nuclear Power Plants with a Focus on Human Factors Engineering and Instrumentation and Control Systems**

**Hosted by the**

**Government of the Republic of Korea**

**through the**

**Korea Hydro & Nuclear Power Co., Ltd (KHNP)**

**Daejeon, Republic of Korea**

**and virtual participation via Microsoft Teams**

**10 - 14 November 2025**

**Ref. No.: EVT2405364**

## **Information Sheet**

### **Introduction**

As artificial intelligence (AI) technology rapidly advances and becomes widely integrated into industries and our daily lives, the nuclear industry is also exploring the use of AI applications. To ensure that nuclear power continues to fulfil its significant role as a sustainable and reliable energy source, AI is being reviewed to enhance safety and reduce operational and maintenance costs in both existing and advanced nuclear power plants, including small modular reactors (SMR). However, AI has the potential to introduce new functions that were previously unimaginable, which may impact safety in unexpected ways. Therefore, the use of AI applications requires rigorous and comprehensive safety evaluations to ensure that they do not compromise the safety of nuclear power plants.

The nuclear industry has already adopted complex digital technologies, considering human factors with the development of related safety guidelines, such as the IAEA Safety Standards Series No. SSG-39, Design of Instrumentation and Control Systems for Nuclear Power Plants, and SSG-51, Human Factors Engineering in the Design of Nuclear Power Plants. However, the practice of relying on proven technologies to ensure safety has presented challenges in keeping pace with rapidly advancing digital technology, particularly in developing safety guidelines with consensus from all Member States. As AI technology advances even faster than digital technology, there is an urgent need to discuss the safety implications of AI applications and revise safety guidelines accordingly.

In 2023, the IAEA held a Technical Meeting on the safety impact of AI in nuclear power plants, where multiple Member States emphasized the need for discussions on safety guidelines for AI applications. In response, the IAEA plans to consider the use of AI in nuclear installation applications during the next revision of the safety guides related to instrumentation and control systems and human factors engineering in the design. Through this Technical Meeting, the IAEA aims to facilitate discussions and share diverse perspectives on the topic.

## **Objectives**

The purpose of the event is to provide a platform for Member States to advance discussions on the safety implications of the use of artificial intelligence in the nuclear field, with a focus on the design of nuclear power plants. The event will aim to compile relevant information for future updates to Human Factors Engineering in the Design of Nuclear Power Plants (IAEA Safety Standards Series No. SSG-51) and Design of Instrumentation and Control Systems for Nuclear Power Plants (IAEA Safety Standards Series No. SSG-39).

## **Target Audience**

Participation is solicited from professionals from nuclear power plant design organizations, operating organizations, nuclear regulatory authorities, technical support organizations and research institutions, as well as from international organizations, engaged in activities related to nuclear power plant safety and regulation. To ensure maximum effectiveness in the exchange of information, participants should be actively involved in the subject of the event.

## **Working Language(s)**

English

## Topics

Topics to be discussed will include:

- Safety benefits and challenges of using AI applications in current and advanced nuclear power plants, including SMRs.
  - Experience of AI applications already implemented in nuclear power plant.
  - Feasible AI applications for nuclear power plant in the near future.
- Experience in evaluating the safety impact of AI applications and related challenges.
  - Software verification and validation for the AI applications.
  - Data quality controls for reliable AI applications.
- Safety implication of the use of AI application in I&C system, particularly:
  - Potential impact of AI applications on the performance of the safety functions;
  - Independence between safety components and AI applications;
  - Revisions required for SSG-39 due to applications of innovative technologies.
- Safety implication of the use of AI application in human factors engineering, particularly:
  - Human and AI interfaces and safety responsibility;
  - Safety impact of the failure of AI based operator support function;
  - Impact of use of AI applications to human factors analyses, such as staffing;
  - Revisions required for SSG-51 due to applications of innovative technologies.

## 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 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 **31 July 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](mailto: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 **31 July 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](mailto:InTouchPlus.Contact-Point@iaea.org).

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. Further information can be found in the [Data Processing Notice](#) concerning IAEA InTouch+ platform.

## Presentations

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

Participants who wish to 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 two pages (including figures and tables), and should not exceed 1500 words. It should be sent electronically to Mr Kim Yung Goo, the Scientific Secretary of the event (see contact details below), not later than **31 August 2025**. Authors will be notified of the acceptance of their proposed presentations by **30 September 2025**.

In addition to the registration already submitted through the InTouch+ platform, participants have to submit the abstract to their competent national authority (e.g., Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or organization for onward transmission to the IAEA not later than **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 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, together with the submission of the application, by **31 July 2025**.

## Visas

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

## Organization

### Scientific Secretary

**Mr Yun Goo Kim**

Division of Nuclear Installation Safety  
Department of Nuclear Safety and Security  
International Atomic Energy Agency  
Vienna International Centre  
PO Box 100  
1400 VIENNA  
AUSTRIA

Tel.: +43 1 2600 21236

Fax: +43 1 26007

Email: [Y.G.Kim@iaea.org](mailto:Y.G.Kim@iaea.org)

### Administrative Secretary

**Ms Sanja Hadzic**

Division of Nuclear Installation Safety  
Department of Nuclear Safety and Security  
International Atomic Energy Agency  
Vienna International Centre  
PO Box 100  
1400 VIENNA  
AUSTRIA

Tel.: +43 1 2600 22588  
Fax: +43 1 26007  
Email: [S.Hadzic@iaea.org](mailto:S.Hadzic@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 Secretary.

## **Event Web Page**

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

<https://www.iaea.org/events/evt2405364>