



Technical Meeting on Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance

Hosted by the
Government of United States of America

through
U.S. Nuclear Regulatory Commission (US NRC)

NRC Headquarters, Rockville, Maryland, USA

18–21 March 2024

Ref. No.: EVT2300917

Information Sheet

Introduction

In July 2022, the IAEA organized a Consultancy Meeting (CM) with the key members from a working group of Artificial Intelligence (AI) for Nuclear Power to discuss the near-term deployment of AI in nuclear power plants (NPPs) and to advise the IAEA on activities that would assist Member states experts.

The discussions during the meeting aimed to understand technological challenges, knowledge gaps, regulatory aspects, resources required via collaborative effort among Member States, and opportunities for the development, demonstration, and application of explainable AI in the nuclear power sector.

Several observations from the discussions led to developing a set of recommendations to guide the path forward:

- Recommendation 1: Engage stakeholders and experts to develop and issue a publication providing overall considerations and guidance on development and deployment of AI solutions for the nuclear industry.
- Recommendation 2: Establish an IAEA Collaborating Center on AI.
- Recommendation 3: Issue a user centric technical publication on AI methods and metrics.
- Recommendation 4: Engage regulators from all interested member states to facilitate alignment of country specific regulatory framework and capture this consensus in an appropriate publication of the Agency.
- Recommendation 5: Issue a publication on successful implementation of AI.
- Recommendation 6: Design and implement competitive benchmark exercises and privacy-preserving AI.

Recognizing the relevance of the above-mentioned recommendations, the CM working group advised to the IAEA that it should initiate relevant activities to address related challenges in the nuclear power engineering field.

In response, the IAEA is developing a new Nuclear Energy Series report provisionally entitled *Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance* to provide guidance to Member States in this area.

Objectives

The purpose of the event is to finalize the new IAEA Technical Document entitled *Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance* to provide implementation considerations for Member States interested in the deployment of artificial intelligence in nuclear power plants.

Target Audience

In view of the subject of the event, participation is limited to IAEA Member States that currently operate nuclear power plants (NPPs) or are constructing their first NPP units, Member States collaborating in the IAEA AI Working Group and Member States interested in developing an AI programme. Participation is solicited from representatives of nuclear facilities and regulatory bodies, utilities, technical support organizations, designers, developers, vendors, and research organizations and universities engaged in the field of design and application of AI at NPPs. To ensure maximum effectiveness in the exchange of information, participants should be persons actively involved in the subject matter of the event.

The event will allow for virtual participation via Microsoft Teams and is, in principle, open to all officially designated persons. The IAEA, however, reserves the right to limit participation due to limitations imposed by the available facilities. The maximum number of in-person participants for this

event (excluding those from USA) is 100. It is therefore recommended that interested persons take the necessary steps to secure their official designation as early as possible.

Working Language

The working language of the event will be English; no interpretation will be provided.

Structure

The draft manuscript of the new IAEA Nuclear Energy Series report, provisionally entitled *Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance*, will be provided to the participants prior to the event. This draft will serve as the basis for dialogues at the event. Participants will be requested to review selected parts of the document and to provide their remarks and comments.

Topics

Presentations are invited on all approaches related to the deployment of AI applications for the Nuclear Power Industry. The following list provides examples of presentation topics that would be appropriate for the event:

- AI benefits for existing and future NPPs;
- Lessons learned from experience (case studies, operating experience, proven practices, etc.);
- Human-machine interactions issues and potential resolutions;
- Known challenges/shortcomings/failure modes of AI technologies related to AI deployment (challenges/obstructions to AI in NPPs);
- Generic acceptance guidelines and safety review;
- Safety and security challenges;
- AI lifecycle management;
- Data governance;
- AI regulatory considerations;
- Categories – levels of autonomy and possible graded approach;
- Explainability;
- Trustworthiness and Ethical uses of AI.

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 **15 January 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 the 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. Further information can be found in the [Data Processing Notice](#) concerning IAEA.

Expenditure 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 on whose behalf assistance is requested 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 **15 January 2024**.

Visas

Designated participants who require a visa to enter USA should submit the necessary application as soon as possible to the nearest diplomatic or consular representative of USA.

Presentations

Presentations should be prepared as Microsoft PowerPoint (ppt) or Portable Document Format (pdf) files. Computer-based projection facilities will be provided. Authors are requested to provide the Scientific Secretary with electronic copies of their presentation files in advance of their scheduled presentation slot so that the files can be duly uploaded. Electronic versions of the presentations are also necessary to ensure timely issuance of the proceedings to be prepared and distributed in electronic form.

It is not mandatory for all participants to submit a presentation. However, the IAEA welcomes and encourages contributions in this format. Time for the presentations will be limited to 25 minutes

followed by a 5-minute discussion period. The number of presentations may have to be limited so as to leave sufficient time for discussions and review of the draft IAEA Nuclear Energy Series report provisionally entitled *Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance*.

Additional Information

The event will start on Monday, 18 March 2024, at 9.30 a.m. and end on Thursday, 21 March 2024, at 2.00 p.m.

The event agenda, together with information on local arrangements, will be sent to the designated participants in due course.

The local representatives of the host organization (US NRC) will be Mr Matthew Dennis and Ms Donna-Marie Sangimino.

Contact details:

Mr Matthew Dennis

Reactor Systems Engineer Data Scientist

U.S. Nuclear Regulatory Commission

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Office of Nuclear Regulatory Research (RES)

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Email: matthew.dennis@nrc.gov

Ms Donna-Marie Sangimino

Senior International Relations Officer, Team Lead

U.S. Nuclear Regulatory Commission

International Programs Team

Office of Nuclear Regulatory Research (RES)

Tel: +1 301-415-2157

Email: donna-marie.sangimino@nrc.gov

The host organization (US NRC) will provide information to help participants in making hotel room reservations. Additionally, participants may elect to make their own bookings at hotels in the area of the event location.

IAEA Contacts

Scientific Secretary:

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Division of Nuclear Power
Department of Nuclear Energy
International Atomic Energy Agency
Vienna International Centre
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Tel.: +43 1 2600 22804

Email: O.Gloeckler@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.

Participation Form

Technical Meeting on the Deployment of Artificial Intelligence Solutions for the Nuclear Power Industry: Considerations and Guidance

US NRC Headquarters, Rockville, Maryland, USA and virtual participation via Microsoft Teams

18–21 March 2024

To be completed by the participant and sent to the competent national 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) either by email to: Official.Mail@iaea.org or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary N.Ngoy-Kubelwa@iaea.org and to the Administrative Secretary O.Gloeckler@iaea.org.

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 January 2024

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms
Institution:		
Full address:		
Tel. (Fax):		
Email:		
Nationality:	Representing following Member State/non-Member State/entity or invited organization:	
If/as applicable: Do you intend to submit a paper? Yes <input type="checkbox"/> No <input type="checkbox"/> Title: I plan to attend virtually: Yes <input type="checkbox"/> No <input type="checkbox"/>		

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.

Grant Application Form

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Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yy/mm/dd):	Nationality:	
I plan to attend virtually:	Yes <input type="checkbox"/> No <input type="checkbox"/>	

1. Education (post-secondary):

Name and place of institution	Field of study	Diploma or Degree	Years attended from	to

2. Recent employment record (starting with your present post):

Name and place of employer/organization	Title of your position	Type of work	Years worked from	to

3. Description of work performed over the last three years:

4. Institute's/Member State's programme in field of event:

Date: **Signature of applicant:** _____

Date: **Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority** _____