



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Training Workshop on Non-Destructive Examination, In-Service Inspection and Online Monitoring for Research Reactors

**IAEA Headquarters
Vienna, Austria**

04 – 08 November 2024

Ref. No.: EVT2202277

Information Sheet

Introduction

There are approximately 224 research reactors currently in operation worldwide. 70% of the operating research reactors (RRs) are now over 40 years old. The majority of operating RRs face various negative effects of ageing. As research reactors continue to operate, there is an increasing need for enhancing their asset management programmes that involve advanced predictive maintenance technologies for equipment monitoring and ageing management.

The IAEA has consistently supported RR operation and maintenance programmes, particularly the formulation and implementation of ageing management and surveillance programmes, which include the regular examination of structures, systems and components of reactor facilities for potential degradation in order to verify reactor safety and maintain optimal availability. A comprehensive programme of ageing management and surveillance is carried out through routine inspection and periodic testing as well as corrective or preventive maintenance, which include activities important for safety and the operational performance of structures, systems and components.

The IAEA has established guidelines for Non-Destructive Examination (NDE)/In-Service Inspection (ISI) as part of the ageing management and surveillance programmes of RRs. They cover:

- NDE methodology for use in ISI of various types of RR;

- Preparation of appropriate programmes/plans/schedules, including documentation, as well as their implementation;
- Appropriate methods and procedures to be used in ISI of various types of RR; and
- Requirements for qualification and certification of NDE personnel involved in ISI of RRs.

The IAEA has several publications (published and in printing process) on the subject (see Reference and Publications below).

The IAEA can assist Member States with research reactors with equipment and experts, providing NDE/ISI services. The IAEA can also assist to train technical personnel, promulgate best practices and improve ageing management and surveillance programmes.

Online Monitoring (OLM) technologies have been successfully implemented in power reactors for a number of applications such as condition-based calibration, performance monitoring of process instrumentation systems, detection of process anomalies, and distinguishing between process problems/effects and instrumentation/sensor issues. In spite of great advances in OLM technologies for power reactors, research reactors are yet to benefit from all that OLM can offer. The experience from these implementations has stimulated an interest in the research reactor community to use OLM for improved maintenance regimes, safety and reliability of research reactors, and to contribute to their life extension and ageing management objectives.

Objectives

The purpose of the event is to provide training on Non-destructive Examination methodologies and techniques, insight on In-service Inspections and Online monitoring practices for research reactors.

The workshop is intended to improve practical competence in conducting NDE, ISI and OLM at the RRs of participating Member States and to share and discuss experiences, challenges and lessons learned in relation to the development, implementation and continuous improvement of NDE/ISI/OLM within ageing management and surveillance programmes. The workshop will include lectures on theory of NDE/ISI/OLM and also provide a practical demonstration using selected IAEA equipment such as ultrasonic testing, videoscope and underwater radiation resistant cameras.

Target Audience

The workshop is aimed at the technical personnel who are involved in NDE, ISI and OLM, for the research reactor facilities. Member States are strongly encouraged to identify suitable women participants.

Working Language

This workshop will be held in English.

Topics

The workshop will include training sessions on the following topics:

- NDE/ISI/OLM techniques applicable to RRs;
- Guidance for OLM implementation;
- Status of OLM of structures, systems and components of RRs;
- Training on the use of NDE/ISI equipment through lectures and demonstrations;
- ISI programmes, and ISI schedules and plans for RR structures, systems and components;
- Qualification requirements for NDE;
- Safety enhancement due to application of NDE/ISI/OLM.

Participants are requested to make brief presentations (~20 minutes) on the status and results of NDE, ISI and OLM in their countries, including information on specific methods used for implementation. There could be more than one presentation from one participant in a specific case.

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 **6 September 2024**, following the registration procedure in InTouch+:

1. Access the InTouch+ platform (<https://intouchplus.iaea.org>):
 - Persons with an existing NUCLEUS account can sign into 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 **6 September 2024**.

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 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.

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 (not longer than one page) of their work. The abstract will be reviewed as part of the selection process for presentations. It should be sent electronically to the Scientific Secretaries of the event (see contact details below), not later than **6 September 2024**. Authors will be notified of the acceptance of their proposed presentations by **25 September 2024**.

In addition, participants have to submit the abstract together with the **Participation Form (Form A)** and the attached **Form for Submission of a Paper (Form B)** 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 **6 September 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 **6 September 2024**.

The countries eligible for TC (Technical Cooperation) assistance which participate in TC projects may submit the request for TC support through their respective National Liaison Officers (NLOs). In this case, TC specific forms to attend the event need to be employed. Detailed information and forms are accessible in the following web page:

<https://www.iaea.org/services/technical-cooperation-programme/how-to-participate>

Department of Technical Cooperation is using InTouch+. Participants can apply and submit all required documents online. National authorities will be able to use InTouch+ to review and approve these applications. Interested parties that would like to use this facility should write to: InTouchPlus.Contact-Point@iaea.org.

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:

<http://www-pub.iaea.org/iaeaevents/GeneralInfo/Guide/VIC>.

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.

Reference and Publications

IAEA documents containing useful information related to OLM, NDE and ISI are as follows:

- 1) Safety of Research Reactors, IAEA Safety Standards Series No. SSR-3, Vienna, 2016.
- 2) Training Guidelines in Non-destructive Testing Techniques (IAEA-TECDOC-628/Rev. 3, Vienna, 2013).
- 3) Training Guidelines in Non-Destructive Testing Techniques: Manual for Visual Testing at Level 2 (IAEA Training Course Series No.54, 2013).

- 4) Training Guidelines in Non-destructive Testing Techniques: Leak Testing at Level 2 (IAEA Training Course Series No.52, 2012).
- 5) Non-Destructive Testing: Sample Questions for Conduct of Examinations at Levels 1 and 2 (IAEA Training Course Series No.45, 2010).
- 6) Ageing Management for Research Reactors (IAEA Safety Standards Series No. SSG-10, Vienna, 2010).
- 7) Risk Informed In-service Inspection of Piping Systems of Nuclear Power Plants: Process, Status, Issues and Development (IAEA Nuclear Energy Series No. NP-T-3.1, Vienna, 2010).
- 8) Maintenance, Periodic Testing and Inspection of Research Reactors (IAEA Safety Standards Series No. SSG-81, Vienna, 2023).
- 9) Non-destructive Testing for Plant Life Assessment (Training Course Series No. 26, IAEA, Vienna, 2005).
- 10) Improvement of in-service inspection in nuclear power plants (IAEA-TECDOC-1400, Vienna, 2004).
- 11) Improvement of Effectiveness of in-service inspection in nuclear power plants (IAEA-TECDOC-1853, Vienna, 2018).
- 12) Maintenance, Testing, Surveillance and Inspection in Nuclear Power Plants (IAEA Safety Standards Series No. SSG-74 , Vienna, 2022).
- 13) Application of non-destructive testing and in-service inspection at research reactors (IAEA-TECDOC-1263, Vienna, 2001).
- 14) On-line Monitoring of Instrumentation in Research Reactors (IAEA-TECDOC-1830, Vienna, 2017).
- 15) Advanced Surveillance, Diagnostic and Prognostic Techniques in Monitoring Structures, Systems and Components in Nuclear Power Plants (IAEA Nuclear Energy Series No. NP-T-3.14, Vienna, 2013).
- 16) On-line Monitoring for Improving Performance of Nuclear Power Plants, Part 1: Instrument Channel Monitoring (IAEA Nuclear Energy Series NP-T-1.1, Vienna, 2008).
- 17) On-line Monitoring for Improving Performance of Nuclear Power Plants, Part 2: Process and Component Condition Monitoring and Diagnostics (IAEA Nuclear Energy Series No. NP-T-1.2, Vienna, 2008).
- 18) Condition Monitoring and Incipient Failure Detection of Rotating Equipment in Research Reactors (IAEA-TECDOC-1920, Vienna, 2020).

IAEA Contacts

Scientific Secretaries:

Mr Sumanth Panyam
Research Reactor Section
Division of Nuclear Fuel Cycle and Waste Technology
Department of Nuclear Energy, International Atomic Energy Agency
Vienna International Centre
PO Box 100, Office A2448
1400 Vienna, Austria
Tel.: +43 1 2600 ext.: 21558
Fax: +43 1 26007
Email: S.Panyam@iaea.org

Mr Kaichao Sun
Research Reactor Safety Section
Division of Nuclear Installation Safety
Department of Nuclear Safety and Security, International Atomic Energy Agency
Vienna International Centre
PO Box 100, Office B0621
1400 Vienna, Austria
Tel.: +43 1 2600 ext.: 26475
Fax: +43 1 26007
Email: K.Sun@iaea.org

Official correspondence with regard to administrative issues should be addressed to the administrative Secretary.

Administrative Secretary:

Ms Reena Thottakkara
Research Reactor Section
Division of Nuclear Fuel Cycle and Waste Technology
Department of Nuclear Energy, International Atomic Energy Agency
Vienna International Centre
PO Box 100, Office A2446
1400 Vienna, Austria
Tel.: +43 1 2600 22755
Fax: +43 1 26007
Email: R.Thottakkara@iaea.org

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

Form A – Via InTouch+

Form B – See Attachment.

Form C – Via InTouch+

Form for Submission of a Paper

Training Workshop on Non-Destructive Examination, In-Service Inspection and Online Monitoring for Research Reactors

04 – 08 November 2024, IAEA Headquarters, Vienna, Austria

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 Secretaries, Mr Sumanth Panyam [S.Panyam@iaea.org], Mr Kaichao Sun [K.Sun@iaea.org] and to the Administrative Secretary, Reena Thottakkara [R.Thottakkara@iaea.org].

Deadline for receipt by IAEA through official channels: 6 September 2024

Title of the paper:		
If applicable: Abstract ID in IAEA-INDICO:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name(s) and first name(s) of author presenting the paper (same as in passport):	Mr/Ms:	
Mailing address:		

Tel. (Fax):

Email:

I hereby agree to assign to the International Atomic Energy Agency (IAEA):

- the copyright; or
- the non-exclusive, worldwide, free-of-charge licence (this option is only for those authors whose parent institution does not allow them to transfer the copyright for work carried out in that institution) granting the IAEA world rights for the use of the aforementioned material in this and any future editions of the publication, in all languages, and in all formats available now, or to be developed in the future (digital formats, hard copy etc.).

Please note: If granting the licence mentioned above, please supply any copyright acknowledgement text required.

Furthermore, I herewith declare:

- that the material submitted to the IAEA is original, except for such excerpts from copyrighted works as may be included with the permission of the copyright holders thereof, has been written by the stated authors, has not been published before, and is not under consideration for publication by another entity;
- that any permissions and rights to publish required for third-party content, including but not limited to figures and tables, have been obtained, that all published material is correctly referenced; and
- that the material submitted to the IAEA does not contain any libellous or other unlawful statements and does not contain any materials that violate any personal or proprietary rights of any person or entity.

Date:

Signature of main author: