



**IAEA**

International Atomic Energy Agency

*Atoms for Peace and Development*

# **Technical Meeting on Risk Informed In-Service Inspection and Decision Making for Research Reactors**

**IAEA Headquarters  
Vienna, Austria**

**04–08 October 2021**

**Ref. No.: EVT2004111**

## **Information Sheet**

### **Introduction**

All research reactors (RRs) face concerns stemming from ageing equipment and components throughout their lifetime. There are approximately 240 research reactors currently in operation worldwide. 60% of the operating research reactors (RRs) are now over 40 years old. As research reactors continue to operate there is an increasing need for enhanced asset management programs that involve advanced predictive maintenance technologies for equipment monitoring, degradation and aging management. The IAEA has consistently supported the operation and maintenance programmes of RRs, particularly in 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. Such programmes are essential for long term operation of RRs with enhanced operational performances and to improve operation and maintenance (O&M) practices throughout their operational life cycle from commissioning up till decommissioning.

In-Service Inspection (ISI) and non-destructive examination (NDE) play an important role in reduction of sudden break down and failures, improving ageing management programs and decision making. The In-service Inspection (ISI) of nuclear power plants began in the late 1970s and was based upon experts' opinion drawing from experience and knowledge of conventional power plant construction and operation. Some of these practices were adopted during the years by Member States (MSs) for RR design, operation and licensing, to enhance and extend the ageing management programmes. The ISI rules in some countries

are endorsed through code consensus and for other countries by good engineering practices. Prioritizing of ISI and NDE activities and decision making is generally based on deterministic approach (DA).

An integrated risk-informed decision-making process including a probabilistic approach will be helpful in planning and conducting ISI and NDE activities in a cost-effective manner. Risk-Informed ISI and decision making (RI-ISI&DM) has been in use in NPPs with examples of tangible benefits. A Probabilistic Safety Assessment (PSA) is a pre-requisite for implementation of a RI-ISI&DM. Taking into account the budgetary constraints along with the increasing burden on account of ageing management activities for the ageing fleet of RRs; MSs may adopt and practice RI-ISI&DM.

The applicability of RI-ISI&DM approach could be relevant and may play important role in optimizing the resources and improving availability & reliability without compromising safety following the NPP operating organizations, as a decision-making tool and graded approach implementation.

The IAEA organized, from 1995 to 2001, a Coordinated Research Project (CRP) on “Application of Non-Destructive Testing and In-Service Inspection to Research Reactors” and a TECDOC was published that summarized the research conducted in 7 MS and established guidelines for NDE/ISI as part of an ageing management and surveillance programme. The IAEA is also preparing to establish and promote a specialized activity for conducting NDE/ISI at research reactors of the Member States.

In 2017 a Consultancy Meeting was held in Vienna, with the participation of experts from 5 Member States, to explore and advise on the feasibility of a proposed CRP on “Risk informed In-Service Inspection and decision making for RRs”. The meeting recommended a collection of information through a questionnaire and a technical meeting with a broader participation of member states to explore the possibility to organize the CRP.

In 2019 a Technical Meeting was organized in Vienna with the participation of 23 participants from 18 Member States and IAEA staff. It was concluded that RI-ISI&DM is an attractive option, specifically for ageing and health management programme, not only for old but for new RRs also, in improving availability reliability and safety and that a CRP on the subject will be beneficial to member states in managing the operating RRs and realize their objectives in a cost-effective manner and it was recommended.

Considering the above background, the IAEA is organizing this second Technical Meeting to facilitate discussions on further developments in the field and support to proposed IAEA Coordinated Research Project (CRP).

## **Objectives**

The objectives of this TM are to bring together experts from the RRs community as well as ISI specialists in order:

- To share experience and compile information on NDE and ISI, probabilistic assessments and RI-ISI&DM practiced in MSs.
- To discuss and formulate scope and methodology of the proposed CRP.

## Target Audience

The meeting is intended for individuals from Member States with an operating research reactor facility or Member States that have initiated a new research reactor project. Participants should be individuals engaged in In Service Inspections, Non-Destructive Examinations; experts in probabilistic risk analysis and the managers responsible for decision making process at their respective research reactor facilities. Specialists in these fields from regulatory bodies can also participate.

## Working Language

The working language of this event will be English.

## Expected Outputs

Meeting report summarizing the discussions and conclusions.

## Topics

In addition to presentations by the IAEA representatives, the meeting will include presentations by the participants on their national practices and experiences in NDE and ISI, probabilistic assessments and RI-ISI&DM followed by discussions that address the following topics:

- NDE and ISI programmes, plans and schedules for structures, systems and components of RRs;
- Recent developments in OLM/NDE/ISI techniques applicable to RRs;
- Probabilistic risk assessment for Reliability, Availability and Maintenance;
- Risk informed ISI;
- Risk informed decision making.

## 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 **30 July 2021**.

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.

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 workshop 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](mailto:InTouchPlus.Contact-Point@iaea.org)

## 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 extend to no more than two pages (including figures and tables) and should not exceed 400 words. It should be sent electronically to Messrs Ram Sharma and Dario Jinchuk, the Scientific Secretaries of the event (see contact details below), not later than **30 July 2021**. Authors will be notified of the acceptance of their proposed presentations by **31 August 2021**.

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 **30 July 2021**.

## 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 **30 July 2021**.

## 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.

# IAEA Contacts

## Scientific Secretaries:

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