IAEA
International Atomic Energy Agency
Atoms For Peace

Technical Meeting on the Optimization of Non-Destructive Examination and In-Service Inspection to Improve Nuclear Power Plant Performance

Hosted by the
Government of Finland

through the
VTT Technical Research Centre of Finland

Espoo, Finland

18–21 October 2016

Ref. No.: I2-TM-52145

Information Sheet

A. Introduction

Assets such as nuclear power plants (NPPs) require regular maintenance to run efficiently; even a minor critical component defect can cause undesirable production loses or reduction in safety. In-service inspection involves the conduct of maintenance inspections, performance verification and preventive defect analysis to help maximize safety and productivity, reduce production loses and thereby to improve plant performance.

During the operating life of an NPP its components might be exposed to influences whose individual or combined effect cannot be fully predicted for the operating life of the plant with the level of accuracy that is desirable to ensure nuclear safety. The most important factors are stress, temperature, irradiation, hydrogen absorption, corrosive attack, vibration and fretting, all of which depend upon time and operating history. These influences may result in changes in material properties such as embrittlement, fatigue, formation and/or growth of flaws and ageing.

Non-destructive examination (NDE) and in-service inspection (ISI) are important ways of assuring equipment integrity and avoiding failures and thus represent a key tool in the management of NPP safety and operating lifetime. Periodic ISI carried out during maintenance outages at NPPs delivers an essential input for assessing the structural integrity of primary circuit components. Traditionally, the inspection sites were based on prescribed codes and regulations. One way to enhance ISI effectiveness is the optimized selection of inspection sites whose failure has a relatively higher probability of occurring and/or more severe consequences —that can be determined by probabilistic safety analysis. In such cases, the corresponding mitigatory action, as a result of a proper NDE, effectively reduces the risk of failure and in that way improves plant performance.

The ISI programme should establish requirements that need to be met in order to maintain the NPP while in operation and to return the plant to service, following plant outages and repair or replacement activities. These above mentioned condition requires a mandatory programme of scheduled examinations, testing and inspections to demonstrate adequate safety.

B. Objectives

The purpose of the meeting is to provide a platform to share knowledge and experiences related to ISI at NPPs. It will introduce the draft version of a technical publication developed by the IAEA on how to achieve an effective ISI programme.

The meeting will, in particular, address the following aspects relevant to ISI:

- An ISI programme and its requirements
- Principle of NDE/ISI methodologies
- ISI effectiveness
- Status of risk-informed inspection in Member States
- Qualification process

C. Expected Outputs

The following outputs will result from the meeting:

Updated draft of a new IAEA technical publication with the provisional title *Improvement of In-Service Inspection at Nuclear Power Plants*.

The proposed new publication will provide information regarding the requirements that have to be met in order to achieve an effective ISI programme at an NPP.

The main topics to be covered during the meeting include:

- Essential elements of an ISI programme
- Basic elements of ISI effectiveness
- Risk-informed ISI
- Operational experience, lessons learned
- Key performance indicators

This publication is currently under development via a consultancy process. A copy of the latest draft will be provided to the participants approximately one month prior to the meeting. Participants will be asked to provide written feedback on the draft text prior to the meeting and to highlight significant comments as part of their presentations at the meeting.

D. Target Audience and Conditions of Participation

The meeting is targeted at nuclear industry professionals, including maintenance managers, operators, designers, vendors and regulators from Member States with established nuclear power generation programmes. It is possible that the meeting may have to be restricted to one participant per country.

Individuals attending should be staff members of operating NPPs, or from non-governmental or international organizations that represent nuclear power programmes and facilities, regionally or worldwide. Representatives of Member States with a programme or project for implementing their first NPP are encouraged to attend in order to maximize the exchange of information on ISI. As such, the meeting targets staff from nuclear energy programme implementing organizations, operators and designer and vendor companies who are involved in the supervision or conduct of ISI.

Participants should be knowledgeable and experienced in industry-wide NPP design and operational practices, rules and regulations, and their implementation with respect to ISI. They should be capable of describing and discussing in detail their knowledge and experiences as well as the challenges related to ISI.

The participants will be asked to give presentations on the meeting topics in order to fulfil the meeting's objectives.

E. Visas

Designated participants will be required to enter Finland and should submit the necessary visa application to the nearest diplomatic or consular representative of the Finland as soon as possible.

F. Expenditure

Designating Governments will be informed in due course of the names of the selected candidates and will at that time be given full details on the procedures to be followed with regard to administrative and financial matters.

No registration fee will be charged to participants. The costs of the meeting, including the meeting facilities and meeting logistic support, are to be borne by the IAEA. Travel and subsistence expenses of participants may be borne by the IAEA utilizing the limited funds that are available to help cover the cost of certain participants. Such assistance may be offered upon specific request 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 meeting. The application for financial support should be made at the time of nominating the participant.

It should be noted that compensation is not payable by the IAEA for any damage to or loss of personal property. The IAEA also does not provide health insurance coverage for participants in meetings, workshops or training courses or for consultants. Arrangements for private insurance coverage on an individual basis should therefore be made. The IAEA will, however, provide insurance coverage for accidents and illnesses that clearly result from any work performed for the IAEA.

G. Papers

No formal papers will be required for this meeting; however, the submission of written comments on the draft text of the new publication provisionally entitled *Improvement of In-Service Inspection at Nuclear Power Plants* (see Section C above) prior to the meeting is expected.

H. Working Language

The meeting will be conducted in English. No interpretation will be provided.

I. Local Arrangements

The meeting will be held at the VTT Technical Research Centre of Finland (Vuorimiehentie 3, 02150 Espoo, Finland) and will start at 09:30 on Tuesday, 18 October 2016, and end at 15:30 on Friday, 21 October 2016. Participants are kindly requested to be at the venue at least an hour before the meeting starts, to allow adequate time for registration. Participants should bring some form of personal identification, such as a national passport, in order to identify themselves to the security officers.

The meeting agenda and local details, together with information on local arrangements, will be sent to designated participants once the completed Participation Forms have been received.

J. Organization

Scientific Secretary:

Mr Harri Tapani VARJONEN
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Department of Nuclear Energy
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Administrative Secretary:

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Department of Nuclear Energy
International Atomic Energy Agency
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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary and correspondence on other matters related to the meeting to the Administrative Secretary.

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Form A
I2-TM-52145

Participation Form

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To be completed by the participant and sent to the competent official 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), Vienna International Centre, PO Box 100, 1400 Vienna, Austria, either electronically by email to: Official.Mail@iaea.org or by fax to: +43 1 26007 (no hard copies needed) with reference to **IAEA meeting TM-52145**.

At the same time as you send the original to your national authority, please send a copy of this form directly to the IAEA Scientific Secretary of the meeting, Mr Harri Tapani Varjonen, at: H.Varjonen@iaea.org, and to the Administrative Secretary, Ms Ana Bakholdina-Schnitzer, at: A.Bakholdina-Schnitzer@iaea.org.

Deadline for receipt by IAEA through official channels: 27 June 2016

Surname:	**Given names:**	**Mr/Ms:**
Title and position:	**Nationality:**	
Organization/Company:		
Full mailing address (including country):		
Phone (including country code):	**Fax (including country code):**	
Email 1:	**Email 2:**	
Designating Government or organization:		
I intend to give a presentation: No ☐ Yes ☐, with the following title: Include a brief description of a presentation (up to 50 words)		
Date:	**Signature:**	

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Form C
I2-TM-52145

Grant Application Form

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Family name:	Given name(s):	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yyyy/mm/dd):	Nationality:	

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 meeting:

Date: **Signature of applicant:** _____

Date: **Name, signature and stamp of responsible Government official:**

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