



IAEA

International Atomic Energy Agency

Atoms for Peace

Announcement and call for papers

**TECHNICAL MEETING ON
DEGRADATION OF PRIMARY COMPONENTS
OF PRESSURIZED WATER COOLED NUCLEAR
POWER PLANTS: CURRENT ISSUES AND
FUTURE CHALLENGES**

Vienna, Austria

5 - 8 November 2013

Organized by the

International Atomic Energy Agency (IAEA)

In Cooperation

European Commission (EC) Joint Research Centre

Online pre-registration:

<http://meeting.iaea.org/default.aspx?meetingid=45320>

BACKGROUND

There has been a steady realization among IAEA Member States that nuclear power is one of the most reliable sources of energy. This realization has sparked the interest of several Member States in starting new nuclear power programmes. One of the major impediments to nuclear power has been a negative public perception, partly due to historic nuclear accidents such as Chernobyl, Three Mile Island and Fukushima, and partly due to a negative media attitude concerning nuclear power. As the current number of nuclear power plants (NPPs) are in the process of obtaining licensing for extended lifetime operation, a number of safety and technological aspects need to be addressed adequately. Environmentally-induced materials problems in NPPs are responsible for a significant proportion of NPP outage time and are a cause of great concern, especially as the age of the current NPP fleet gradually increases. Understanding the mechanisms of radiation damage and possible mitigation thereof through design, means that this is an important subject for both operating NPPs and advanced NPP designs of water cooled reactors. A Technical Meeting on this subject is targeted at both the designers and operators of such reactors and is of paramount importance, especially when the relevant information can be presented from a mechanistic point of view. In addition, the Technical Meeting would aim to share the best practice and experience applicable to the subject and is envisaged to elicit interest in many Member States.

Previous IAEA Technical Meetings on the effects of radiation embrittlement on reactor pressure vessels (RPVs) have been conducted as listed in the table below. In the last two meetings, the embrittlement effects on reactor vessel internals (RVI) also have been included. In this upcoming Technical Meeting, primary system components other than the RPV and RVI are being included, although there is still a strong emphasis on radiation damage mechanisms.

Meeting Location	Year of Meeting
Znojmo, Czech Republic	2010
Gus Khrustalny, Russia	2004
Gloucester, England	2001
Madrid, Spain	1999
Vladimir, Russia	1997
Espoo, Finland	1995
Paris, France	1993
Balatonfured, Hungary	1990

OBJECTIVES

The objectives of the Technical Meeting are to provide participants with information on the degradation of ferritic and stainless steels in reactor pressure vessels (RPVs), heads, core internals; piping steels, steam generators, and degradation of other components. Furthermore, the workshop will cover materials degradation issues for boiling water cooled reactors and other technological issues

affecting the current fleet of light and heavy water cooled reactors. Based on the experts' presentations and discussions, priorities and gaps will be identified in research and technological areas.

EXPECTED OUTCOME OF MEETING

The outcome of the meeting will be a meeting report summarizing the participants' activities and recommendations. The report will reflect the importance and relevance of research, characterisation and testing of NPP primary components. In addition, the full proceeding will be published electronically.

MEETING FORMAT

The format of the meeting will be a combination of invited and contributed oral presentations along with posters in sessions devoted to special topics with subsequent technical discussion. Some restrictions will be imposed on the duration of the invited and contributed oral presentations. Posters will be available for viewing and discussion with the authors during all coffee breaks throughout the 2-1/2 days.

An electronic projector with a computer capable of reading CDs and memory sticks will be available (Power Point or Acrobat recommended). The official language of the meeting is English. No interpretation will be provided. It is expected that the technical meeting will start at 09:00 on 6 November 2013 and will be concluded by 15:30 on 8 November 2013. Prior to the technical Meeting, a one-day training course will be commenced at 9:00 on 5 November 2013.

STRUCTURE OF THE MEETING

The meeting will consist of three main topics broken into three sessions each along with the opening and closing sessions. The closing session also will include a panel discussion amongst the invited keynote speakers and session chairmen and co-chairmen.

Topic 1: Degradation of primary system components

This topic intends to share information on degradation of primary system components, except for radiation damage which is covered by Topic 2. For primary system operating temperatures (260–370°C), the following degradation mechanisms are recognized as important to ageing of structures and components: stress corrosion cracking issues, fatigue, thermal ageing, etc. Presentations will cover technical issues related to this topic of the meeting:

- Effect of operating parameters (pressure temperature, stratification, water chemistry)
- SCC/general corrosion, thermal and environmental fatigue, thermal ageing issues
- Leak-before-break; no-break assessment; regulatory aspects; codes & standards

Topic 2: Effects of irradiation-induced damage of reactor pressure vessels and reactor vessel internals

This topic will provide a summary of the current knowledge on irradiation-induced damage in RPVs and internals (nature of defects, involved mechanisms). In this topic, many interpretations, mechanisms, and models, have been put forward to explain experimental data over the last 40-50 years. Presentations will cover technical issues related to the topic of the meeting such as:

- Mechanisms governing the irradiation-induced embrittlement
- Irradiation effects (dose-rate effect, high fluence effect, etc.)
- Formation of irradiation-induced defects
- Mechanisms controlling the evolution of mechanical properties

Topic 3: Structural analysis and integrity assessment for long term operation

The changes in RPV material properties (from the original fabrication condition) due to neutron irradiation are monitored by means of surveillance programmes. Every operating reactor pressure vessel has some sort of an on-going RPV surveillance specimen programme. To date, several hundred surveillance capsules have been removed from their host RPVs and tested. The results from these surveillance capsules have been used to assess primary components integrity. Presentations will cover technical issues related to this topic of the meeting:

- Metallurgical issues (inhomogeneities in material, fabrication history)
- Assessment of RPV embrittlement (incl. annealing and re-irradiation)
- Fracture mechanics testing and evaluation
- RPV surveillance programmes and databases

PARTICIPATION

In order to participate in the meeting, the following important steps must be completed:

1) *Pre-registration*

Online pre-registration is open to all and serves as an indication to the IAEA as to who is interested in participating in the Technical Meeting. However, in addition to pre-registering on-line, all further steps specified below must be completed in order for final registration to be accepted. For online pre-registration please follow this link to Online Pre-registration:

<http://meeting.iaea.org/default.aspx?meetingid=45320>.

2) *Abstract Submission*

Persons wishing to make an oral presentation or a poster must submit an abstract of maximum one page in total length, in electronic format directly to A.Zeman@iaea.org and K.Kang@iaea.org. The abstract must be in text format only and must contain the author's name, affiliation and e-mail address. Acceptable file formats are Microsoft Word, HTML, or plain text. The one page abstract must be received by **2nd September 2013**. The abstracts will be evaluated by the Scientific Committee, and

authors will be informed of the acceptance of their contributions by e-mail, by **16th September 2013**. Authors are requested to designate if their contribution should be considered as an oral presentation or in the poster sessions. The program agenda and a book of abstracts will be prepared and e-mailed to all participants as PDF file attachments.

Important: *Contributors of material to be included in the IAEA's proceedings are required to assign all copyrights or rights to publish to the IAEA.*

The authors should make sure that the files do not include copyrighted fonts or other impediments for reproduction.

The abstract shall be prepared according to the following instructions:

- 1) Page size: A4 (21 cm by 29.7 mm) – vertical orientation
- 2) Margins 25mm all around
- 3) Layout:
 - Title: single-spaced, 14-point size, Times New Roman Font (TNR), bold
 - Authors: single-spaced, 12-point size, TNR Font
 - Affiliation: single-spaced, 12-point size, TNR Font, italic
 - Text: 1.5 spaced, 12-point size, TNR Font
 - Length: one page

Important: *In case of sending Microsoft Word files, authors should use True Type Embedded Fonts (when saving the file, click Tools, then Options, and tick Embed True Type fonts). This will help to prevent change of fonts when the file is read into a different system, as it will be in most of the cases).*

3) IAEA participation

A request for participation will only be accepted if the **Participation Form** is transmitted through the appropriate Governmental representative authority i.e. (Ministry of Foreign Affairs, National Atomic Energy Authority), and if their nomination is received at the IAEA by **2nd of September 2013**.

Persons from IAEA Member States or invited international organizations are eligible to attend. Participants should be actively involved in the subject matter of the meeting. All who wish to participate in the work of this meeting are requested to complete the Participation Form and send it as soon as possible to the IAEA. Participants whose designations have been received by the IAEA will receive further details approximately 6 weeks before the meeting.

PRESENTATIONS

The presentations should be sent either as a Microsoft Word file, Power Point file, or Adobe PDF format file, complete with all text, figures and tables. All presentations will be converted as received, to an Adobe PDF file and placed on a CD-ROM for distribution to all participants at the meeting.

PAPERS

A manuscript will be prepared to be included in the meeting proceedings compiled by the IAEA in CD-ROM format (it will be available on the web and will include the presentations of authors submitting a manuscript). For detailed instructions regarding how to prepare the manuscript please check the link Author Instructions. Authors must submit a signed **Paper Submission Form** to the IAEA for copyright purposes. Electronic version of papers will be collected during the meeting.

EXPENDITURES AND FINANCIAL SUPPORT

The organizational cost of the meeting is borne by the host organization. Travel and all subsistence expenses are to be covered by the participants. No registration fee is charged to participants. As a general rule, the IAEA does not pay for participants' travel and living expenses. However, limited financial support is available to assist the attendance of selected experts with active presentation, principally those from developing Member States. Usually only one grant for financial support is awarded per Member State. If participants or governments wish to apply for a grant on behalf of one of their experts, they should ensure that applications for grants are:

- Received to the IAEA Scientific Secretaries by **2nd of September 2013**,
- Accompanied by a duly completed and signed **Grant Application Form**,
- The participant has an accepted contribution.

Applications that do not comply with these requirements will not be considered. The grants awarded will be in the form of lump sums usually covering only part of the cost of attendance. The grants are paid at the meeting. Grants for financial support will be announced around **16th September 2013**.

VISA

Designated participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria as soon as possible. The IAEA will send an official letter of invitation to nominated participants. It is the responsibility of the participants to arrange their accommodation. Detailed information meeting venue will be communicated to all designated participants approximately 6 weeks before the meeting.

DEADLINES

- 2nd September 2013:** Submittal of abstracts according to the instructions above closes,
- 2nd September 2013:** Submittal of requests to the IAEA for financial support according to the instructions above closes,
- 16th September 2013:** Participants informed of the acceptance of their contributions,
- 16th September 2013:** Participants informed of the acceptance of their request for financial support,
- 5th November 2013:** One day training course on material degradation and RPV embrittlement
- 6th November 2013:** Technical meeting begins

IAEA SCIENTIFIC SECRETARIES

Mr Andrej ZEMAN

NAPC Physics Section

International Atomic Energy Agency

Wagramer Strasse 5, P.O. Box 100

A1400 Vienna, Austria

Email: A.Zeman@iaea.org

Tel.: 0043 1 2600-21705, Fax: 0043 1 26007-21705

Mr. Ki-Sig KANG

NENP Nuclear Power Engineering

International Atomic Energy Agency

Wagramer Strasse 5, P.O. Box 100

A1400 Vienna, Austria

Email: K.S.Kang@iaea.org

Tel.: 0043 1 2600-22796, Fax: 0043 1 2600-29598

GENERAL SECRETARIAT

Ms Rozanna BOJDO

NAPC Physics Section

International Atomic Energy Agency

Wagramer Strasse 5, P.O. Box 100

A1400 Vienna, Austria

Email: R.Bojdo@iaea.org

Tel.: 0043 1 2600-21754, Fax: 0043 1 26007-21754

Ms Tin Ling LOI

Nuclear Power Engineering Section

International Atomic Energy Agency

Wagramer Strasse 5, P.O. Box 100

A1400 Vienna, Austria

Email: T.Loi@iaea.org

Tel: 0043 1 2600-22792, Fax: 0043 1 2600-29598