



**IAEA**  
International Atomic Energy Agency

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# **International Conference on Opportunities and Challenges for Water Cooled Reactors in the 21<sup>st</sup> Century**

**Vienna, Austria  
27 – 30 October 2009**

**Organized by the**

*International Atomic Energy Agency (IAEA)*

*In cooperation with the*

EC Joint Research Centre (EC/JRC)  
OECD Nuclear Energy Agency (OECD/NEA)  
World Nuclear Association (WNA)  
International Electrotechnical Commission (IEC)

## **ANNOUNCEMENT AND CALL FOR PAPERS**

## **1. BACKGROUND**

Water Cooled Reactors have been the keystone of the nuclear industry in the 20th Century. As we move into the 21st Century and face new challenges such as the threat of climate change or the large growth in world energy demand, nuclear energy has been singled out as one of the sources that could substantially and sustainably contribute to power the world. As the nuclear community worldwide looks into the future with the development of advanced and innovative reactor designs and fuel cycles, it becomes important to explore the role Water Cooled Reactors (WCRs) will play in this future.

To support the future role of WCRs, substantial design and development programmes are underway in a number of Member States to incorporate additional technology improvements into advanced nuclear power plants (NPPs) designs. One of the key features of advanced nuclear reactor designs is their improved safety due to a reduction in the probability and consequences of accidents and to an increase in the operator time allowed to better assess and properly react to abnormal events.

A systematic approach and the experience of many years of successful operation have allowed designers to focus their design efforts and develop safer, more efficient and more reliable designs, and to optimize plant availability and cost through improved maintenance programs and simpler operation and inspection practices.

Because many of these advanced WCR designs will be built in countries with no previous nuclear experience, it is also important to establish a forum to facilitate the exchange of information on the infrastructure and technical issues associated with the sustainable deployment of advanced nuclear reactors and its application for the optimization of maintenance of operating nuclear power plants. This international conference seeks to be all-inclusive, bringing together the policy, economic and technical decision-makers and the stakeholders in the nuclear industry such as operators, suppliers, engineers, researchers, educators, managers, government officials and regulators.

## **2. OBJECTIVES**

The objectives of the International Conference on Opportunities and Challenges for Water Cooled Reactors in the 21<sup>st</sup> Century are to:

- Provide a forum for the exchange of information among those interested in the introduction or expansion of nuclear power programmes in the 21st century, taking into account the desire to build capacity in terms of human resources, energy planning, regulatory capabilities and other infrastructure.
- Explore the status and trends in the development of advanced water cooled reactor designs, both for electrical and non-electrical applications.
- Discuss the trends in nuclear power plant design and safety and their anticipated impact on the required capabilities of operating, regulatory and technical support organizations, as well as the advanced technology impacts in safety, reliability and performance improvements.
- Discuss the role of operation and maintenance optimization programmes in assuring safe and reliable nuclear power plant operations.
- Explore the future role of water cooled reactors, by themselves and as a bridge towards the use of innovative nuclear reactors designs and fuel cycles.

### **3. PROGRAMME STRUCTURE AND TOPICS**

To facilitate the objectives, the conference will be structured as follows:

- Plenary Sessions, where renowned international experts will deliver invited papers summarizing the most up-to-date knowledge about a given subject. Each plenary session will have a distinct focus or main topic;
- Panel Sessions, where a group of selected international experts will discuss in an open forum relevant issues;
- Technical Sessions, where a set of detailed technical papers that present the state of the art of the subject area within the session topic and are designed to stimulate discussion among conference participants.

Authors are encouraged to contribute papers on the following topics:

#### **Topic 1: Challenges and Opportunities to Launch New Nuclear Power Programmes**

The aim of this topic is to share information on the challenges and opportunities encountered when starting and/or expanding a nuclear power programme. To take maximum advantage of the existing knowledge and experience, at least for near term deployment, it is expected that most new nuclear power plants built will be water cooled reactors and as such, many of these issues will be intimately related to this type of reactor.

- Infrastructure and other considerations to launch a new nuclear power programme
- Reactor size and grid capacity
- Current nuclear power performance and outlook in different Member States
- Environmental concerns and constraints in national energy policies
- Financing arrangements and options for new nuclear power plants
- Innovative approaches to nuclear fuel cycle
- Knowledge preservation and management against workforce aging
- Technology transfer programme: Balance between project schedule and localization
- Nuclear power sustainability: Advanced fuel cycle and the role of water cooled reactors, synergies with other energy sources, possible scenarios to transition to fast reactors
- Assurance of supply chain: Supply of nuclear grade components and manufacturing capacities
- Waste management: Interim and long term management
- Enhancing the nuclear non-proliferation regime and security
- Innovative approaches for licensing and safety harmonization

#### **Topic 2: Design and Construction of Advanced Water Cooled Reactors (AWCR)**

The aim of this topic is to share information on the status of the design and construction of AWCRs.

- Trends in advanced water cooled reactors design and technology.
- Safety objectives and utility requirements for advanced water cooled reactors
- Advanced construction technologies and management approaches
- Large, medium and small size advanced water cooled reactors designs

- Licensing application for AWCRs
- Performance and safety improvements for AWCRs
- Advanced safety assessment tools and methods
- Simplification of design, and its impact in operation and maintenance

### **Topic 3: Safety and Performance Achievement in Existing Water Cooled Reactors**

This topic will share good practices, technological upgrades and operational improvements to operating NPPs such as plant modifications, power uprates, ageing management, periodic safety review, etc.

- Operational experience: Feedback, analysis and lessons learned
- Optimized maintenance programme
- Optimized outage management practices
- Safety culture and event free tools for inspection and maintenance
- Asset management, process management and leadership
- Reliability centered maintenance and use of PSA
- In-service inspection (ISI) and risk informed ISI
- Safety assessments for plant upgrades (PSA level 2, severe accident management)
- Plant uprating, safety enhancements and performance improvements
- Equipment retrofit, heavy component replacement and I&C ageing management
- Licensing and regulatory issues associated with extended plant operations
- Equipment obsolesce and material degradation

### **Topic 4: Innovative and Advanced Applications of Water Cooled Reactors**

This topic will focus on the use of water cooled reactors in advanced and innovative applications, traditional or non-traditional.

- Transition to future nuclear systems: Fast breeder reactors, Generation IV reactors
- Application of WCRs to desalination and district heating
- Application of advanced monitoring, diagnostic and prognostic systems
- Role of Digital instrumentation and control (I&C) in plant performance improvements
- Innovative and non-traditional application of WCRs

## **4. EXHIBITION**

A limited amount of space will be available for commercial exhibitors' displays/exhibits during the conference. Interested parties should contact the Scientific Secretariat.

## 5. TARGET AUDIENCE:

Those attending the conference are expected to include:

- Senior policy makers at the ministerial level, government officials from energy departments, regulatory bodies, and their technical experts
- Leaders in discussions of climate change policy, decision makers in energy planning, managers of financing organizations, and the press.
- Technical and management persons from operating organizations responsible for various aspects of current nuclear power plant projects, and for planning and implementing new nuclear power plant projects
- Management and experts from nuclear power plant design and research organizations, and from organizations involved in development of fuel cycles for water cooled reactors.

## 6. PAPERS AND POSTERS

Concise papers on issues falling within the topics outlined in Section 3 may be submitted as contributions to the conference. All submitted papers, apart from invited papers, must present original work and they should not have been published elsewhere.

### (a) Submission of synopses

Persons who wish to present a paper or poster at the conference must submit an extended synopsis in English of 800 words together with the completed Form for Submission of a Paper (Form B) and the Participation Form (Form A). The extended synopsis and the forms must be sent to the competent official authority (see Section 13) for transmission to the IAEA in time for them to be received by the IAEA **by 15 April 2009**. In addition, the synopsis should be sent electronically to email: [awcr@iaea.org](mailto:awcr@iaea.org). The synopsis should give enough information on the content of the proposed paper to enable the selection committee to evaluate it.

Authors are urged to make use of the Extended Synopsis Template in Word 2000 on the conference web site (see Section 15). The specifications and instructions for preparing the synopsis and how to use the synopsis template are given in the attached “Instructions on How to Prepare the Synopsis and Submit It Electronically”. Also attached to this announcement is a sample extended synopsis.

The synopsis will be considered only if the Participation Form A and Paper Submission Form B have been received by the IAEA through the official governmental channels or one of the cooperating organizations.

### (b) Acceptance of papers/posters

In order to provide ample time for discussion, the number of papers that can be accepted for oral presentation is limited. If the number of relevant and high quality papers submitted for selection exceeds the acceptable number, some of them will be selected for poster presentation.

Authors will be informed by **15 July 2009** whether their paper has been accepted by the Programme Committee on the basis of the synopsis submitted. At the same time authors will be advised if their paper has been accepted for oral presentation or for presentation as a poster. Those authors whose papers are accepted will be asked to prepare full papers for publication in the proceedings. They will receive guidelines for the preparation of papers and will be requested to submit the final full paper by **10 September 2009**. All accepted synopses will be reproduced in unedited form in the Book of Extended Synopses, which will be distributed at registration.

### (c) Proceedings

The proceedings of the conference containing presentations, conclusions and recommendations will be published by the IAEA as soon as possible after the conference.

The IAEA reserves the right to refuse the presentation or publication of any paper that does not meet the expectations raised by the information originally given in the extended synopsis.

## 7. PARTICIPATION

All persons wishing to participate in the conference are requested to complete a Participation Form (Form A) and send it as soon as possible to the competent national authority (see Section 13) for subsequent transmission to the IAEA. A participant will be accepted only if the Participation Form is transmitted through the competent official authority of a Member State of the IAEA or by an organization invited to participate.

Details on the logistics of the conference will be sent to all designated participants approximately three months before the meeting. This information will be also posted on the conference web page (see Section 15).

## 8. EXPENDITURES

No registration fee is charged to participants.

As a general rule, the IAEA does not pay for participants' travel and living expenses. However, limited funds are available to help meet the cost of the attendance of selected specialists, mainly from developing countries with low levels of economic resources. Generally, no more than one grant will be awarded to any one country.

If governments wish to apply for a grant on behalf of one of their specialists, they should address specific requests to the IAEA to this effect. Governments should ensure that applications for grants:

- (a) Are submitted by **15 April 2009**;
- (b) Are accompanied by a duly completed and signed Grant Application Form (see attached Form C).

Applications that do not comply with the conditions stated under (a) and (b) cannot be considered. The grants awarded will be in the form of lump sums and will usually cover only part of the cost of attendance.

## 9. WORKING LANGUAGE

The working language of the conference will be English. All communications, synopses, abstracts and papers must be sent to the IAEA in English.

## 10. DOCUMENTS

A preliminary programme of the conference will be posted on the conference webpage before the meeting. The final programme and the book of extended synopsis will be available upon registration.

## **11. LOCATION AND ACCOMMODATION**

### **Accommodation**

Detailed information on accommodations and other relevant matters will be sent directly to all designated participants approximately three months before the meeting. This information will also be made available on the conference web page as soon as possible:

<http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=35251>

## **12. VISAS**

Designated participants who require a visa to enter Austria (Schengen State) should submit the necessary applications to the nearest diplomatic or consular representative of Austria or any other consular authority of a Schengen partner State representing Austria as early as possible. Participants are recommended to refer to the conference web site where relevant information will be made available.

## **13. CHANNELS OF COMMUNICATION**

The Participation Form (Form A) and, if applicable, the Forms for Submission of a Paper (Form B) and Grant Application (Form C) should be sent to the competent official authority (Ministry of Foreign Affairs, national atomic energy authority) or to one of the cooperating organizations for transmission to the IAEA.

Subsequent correspondence on scientific matters should be sent to the scientific secretariat, and correspondence on administrative matters to the IAEA Conference Services Section.

## **14. CONTACT INFORMATION**

### **Scientific Secretariat:**

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### **Administration and organization:**

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## **15. CONFERENCE WEB PAGE**

Please visit the IAEA conference web site regularly for new information regarding the conference:

<http://www-pub.iaea.org/MTCD/Meetings/Announcements.asp?ConfID=35251>