



Technical Meeting

on

Reload Design and Core Management

in Operating Nuclear Power Plants:

Experiences and Lessons Learned

Hosted by the
IAEA

Vienna, Austria

4–7 December 2018

Ref. No.: EVT1701702

Information Sheet

A. Background Information

There is increased interest among owner/operating organizations of Member States in improving the efficient and economic generation of electricity by nuclear power plants (NPPs). Member States have expressed the challenges faced and their needs when optimizing reactor reload design and core management. All stages of the nuclear fuel cycle present some challenges with respect to fuel and operation and maintenance costs that can be managed by means of proper and structured design and arrangement.

The reactor core is the heart of an NPP. It is configured to produce maximum thermal power from the available energy in nuclear fuel safely. The economical and technically optimized operation of fuel and core, i.e.

determining minimum energy needs, maximizing the conversion of nuclear energy to thermal energy and enabling reuse of fuel through optimum core design, configuration and operation, requires knowhow in many different technical and economic fields and the integrated management of all aspects.

Typical core design objectives are: 1) maximize core power density; 2) maximize attainable fuel burnup; and 3) minimize the cost of electricity.

These activities are typically divided into two phases: fuel design and core management areas; and out-of-core and in-core management.

In-core management consists of determining energy needs and operating goals for a given operating cycle, and calculating fuel performance parameters, core physics and thermal hydraulics in order to demonstrate the safety case, as well as maximizing neutron economics and minimizing waste of the remaining available energy in the fuel. These evaluations and calculations are performed beginning from the first core load to maintain the safety margins and planned lifetime for each fuel and core. With regard to optimizing the costs of energy production, an important aspect of core design is the reloading scheme. Such cost optimization requires different calculation techniques to determine the fuel costs from the beginning up to the end of the fuel cycle. After these calculations, it needs to be demonstrated that the new cycle's core meets all safety requirements and the expectations and requirements of the owner/operating organization, i.e. cost of new fuel, optimized energy production as well as maximum flexibility of operation, for the safe, reliable and efficient generation of electricity.

Out-of-core management consists of the supply of materials and required services at different stages of the nuclear fuel cycle, such as management of ordering, manufacturing, transportation, acceptance, the storage and loading of fresh fuel, and storage and disposal of spent fuel.

B. Objectives

The objectives of the event are to provide a platform to identify best practices and experiences related to reload design and core management in order to improve the effectiveness of NPPs and share the experiences and lessons learned of different Member States. In addition, a draft technical publication developed by the International Atomic Energy Agency (IAEA) on the relevant elements of core design and core management in operating NPPs will be introduced.

C. Participation

The event is targeted at nuclear industry professionals who are working with core design and core management, and operators, designers 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 from operating NPPs, or from non-governmental or international organizations that represent such 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 core design and core management. Participants should be knowledgeable and experienced in industry-wide NPP design and operational practices, rules and regulations, and their implementation with respect to core design and core management. They should be capable of describing and discussing in detail their knowledge and experience, as well as the challenges of core design and core management.

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

D. Application Procedure

Designations should be submitted using the attached Participation Form (Form A). Completed forms should be endorsed by the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) and returned through the established official channels. They must be received by the IAEA not later than **12 October 2018**. Designations received after that date or applications sent directly by individuals or by private institutions cannot be considered. Designating Governments will be informed in due course of the names of the selected candidates and at that time full details will be given on the procedures to be followed with regard to administrative and financial matters.

For those participants requesting financial assistance, the attached Grant Application Form (Form C) should be submitted at the same time as the Participation Form.

E. 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.

F. Equipment

Workstations and projecting tools will be available for presentations. Laptops/notebooks brought by the participants may be connected to the projecting tools (liquid crystal display data projector) in the meeting rooms.

G. Working Language

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

H. Administrative and Financial Arrangements

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

The costs of the event will be borne by the IAEA; 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 on whose behalf assistance is requested will make an important contribution to the event. **The application for financial support should be made at the time of designating the participant.**

The organizers of the event do not accept liability for the payment of any costs or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the event, and it is clearly understood that each Government, in designating participants, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

I. Local Arrangements

The event will be held in Room C0343 of the C Building at the IAEA, Vienna International Centre, Vienna, Austria, and will start at 9.30 a.m. on Tuesday, 4 December 2018, and end at 3.30 p.m. on Friday, 7 December 2018.

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

J. IAEA Secretariat

The IAEA Scientific Secretaries for the event are:

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International Atomic Energy Agency

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AUSTRIA

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The IAEA Administrative Secretary for the event is:

Ms Inessa Kovalenko

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Department of Nuclear Energy
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Tel.: + 43 1 2600 22801

Fax: + 43 1 2600 29598

Email: I.Kovalenko@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.

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).

Participants who are members of an invited organization can submit this form to their organization for subsequent transmission to the IAEA.

Family name: (e.g. Smith)	First name(s): (e.g. John)	Mr/Ms
Institution:		
Full address:		
Tel:		
Email:		
Nationality:	Representing the following Member State/non-Member State/entity or invited organization:	
Do you intend to submit a paper? Yes <input type="checkbox"/> No <input type="checkbox"/> Would you prefer to present your paper as a poster? Yes <input type="checkbox"/> No <input type="checkbox"/> Title:		



Grant Application Form

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Deadline for receipt by the IAEA through official channels: 12 October 2018

Family name: (e.g. Smith)	First name(s): (e.g. John)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yy/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 conference:

Date: Signature of applicant: _____

Date: Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission
to the IAEA or National Atomic Energy Authority _____