

# INTERNATIONAL ATOMIC ENERGY AGENCY

## TECHNICAL MEETING ON “HOT CELL POST-IRRADIATION EXAMINATION AND POOL-SIDE INSPECTION OF NUCLEAR FUEL” 23-27 May 2011 Smolenice, Slovakia

### INFORMATION SHEET

#### I. PURPOSE AND AIM OF THE MEETING

The purpose of the Technical Meeting (TM) is to provide an overview about the status of post-irradiation examination (PIE) and inspection techniques for nuclear fuel and their applications for analysis of materials degradation during both fuel operation in a reactor core and spent fuel storage conditions. Emphasis will be given to advanced non-destructive and destructive PIE techniques applied to high burnup fuel, fuel rod re-fabrication and instrumentation techniques for in-pile experiments, and poolside inspection methods. This will be the seventh meeting in the series of IAEA TMs, which have been held in 1981 and 1984 (Tokyo, Japan), 1990 (Workington, UK), 1994 (Cadarache, France), 2001 (Dimitrovgrad, Russian Federation) and 2006 (Buenos Aires, Argentina) upon recommendation of the IAEA Technical Working Group on Water Reactor Fuel Performance and Technology (TWGFPT). During its 2010 meeting the TWGFPT recommended to hold the next PIE-related TM in 2011 in Slovakia together with the annual meeting of the HOTLAB Working Group, which is the partner of the IAEA for the joint Database of PIE Facilities, and with a focus on both operational fuel characteristics (IAEA sub-programme “Nuclear Power Reactor Fuel Engineering”) and spent nuclear fuel storage issues (IAEA sub-programme “Management of Spent Fuel from Nuclear Power Reactors”).

Since the last meeting on this topic five years ago, the load on fuel continued to increase, including further burnup extension and greater operational. Implementation of new materials and fuel designs, able to meet these more and more challenging conditions, require adequate operational feedback for proper closing of the quality cycle assuring fuel reliability. The growing demand for fuel modelling (both traditional modelling of fuel behaviour and advanced multi-scale modelling approaches) driven by the skyrocketing costs and duration of direct irradiation experiments also defines a pending need for experimental benchmarking and models verification.

For safe storage of spent fuel during long-term periods the knowledge of aging processes and their impact on fuel and component materials is important. The purpose of materials testing and monitoring is to determine the condition of spent fuel and storage components, and to verify or to validate assumptions related to behaviour of components or materials in a storage system. Spent fuel integrity and performance during storage has been investigated through several IAEA Coordinated Research Projects (CRPs) (BEFAST, SPAR-I, II and III), and a need for continuous monitoring of spent fuel degradation has been identified. This need is further stressed by increased use of high burnup fuel and prospects of very long term storage of spent fuel (120 years and more).

## **II. TOPICS TO BE COVERED**

Papers are invited on all aspects of non-destructive and destructive PIE techniques and methods used for investigation of irradiated nuclear fuel and spent fuel in the long term storage conditions. Recent practice in high burnup fuel investigation has demonstrated importance of advanced PIE techniques, such as 3-D tomography, secondary ion mass spectrometry, laser flash, high resolution transmission and scanning electron microscopy, image analysis, etc. for understanding mechanisms of fuel behaviour under irradiation. Methods and means for fuel sample irradiation, fuel re-fabrication and in-pile irradiation in instrumented rigs are of great value for the fuel performance code validation and verification. On-site inspection methods allow quick obtaining the maximum of fuel performance data after the irradiation in commercial power plants in order to satisfy the needed surveillance programs established by the utilities, regulators and fuel vendors.

In the present situation, characterized by deficiency of PIE facilities, the importance of sharing data and experience is increasing. So, adequate efforts on database development and other forms of information exchange are requested. Organizational and logistics issues can also be addressed.

In the conclusions of related meetings, the following groups of topics were identified as being of particular interest:

- On-site fuel inspection methods;
- Non-destructive methods in hot cells;
- Destructive methods;
- Measurement of mechanical properties;
- Measurement of physical properties;
- In-pile methods of fuel characteristics investigation other than mechanical properties, including corrosion and fission gas release;
- Re-fabrication of fuel for re-irradiation in test reactors;
- Methods of spent fuel testing, inspection and monitoring for long term storage;
- Status and development trends of the PIE databases;
- Organizational and transportation issues.

As usually practiced at these types of meetings, the programme will include session chairs summaries followed by a general discussion permitting participants to contribute to highlights of the meeting and to recommendations on future IAEA and HOTLAB works in this field.

One day of the meeting will be set aside for a technical tour.

### **III. ORGANIZATION**

**Meeting Chairman:** **not decided yet**

**Local Coordinator:** Mr. Vladimir Chrapciak  
VUJE  
Okruzna 5  
918 64 Trnava  
Slovakia  
Phone: +421 33 599 1312  
Fax: +421 33 599 1191  
E-mail: chrapciak@vuje.sk

**Scientific Secretaries:** Mr. V. Inozemtsev  
International Atomic Energy Agency  
Wagramer Strasse 5  
P.O. Box 100  
A-1400 Vienna, Austria  
Phone: +431 2600 22760  
Fax: +431 2600 722760  
E-mail: V.Inozemtsev@iaea.org

Mr. Xuxin Zou  
International Atomic Energy Agency  
Wagramer Strasse 5  
P.O. Box 100  
A-1400 Vienna, Austria  
Phone: +431 2600 25808  
Fax: +431 2600 725808  
E-mail: X.Zou@iaea.org

Ms. Ann Leenaers  
HOTLAB Working Group  
SCK•CEN  
NMS - LHMA  
Boeretang 200  
B-2400 Mol  
Belgium  
Tel.: +32-14-33 30 44  
Fax.: +32-14-32 12 16  
E-mail: ann.leenaers@sckcen.be

#### **IV. DEADLINE FOR PAPERS AND PARTICIPATION IN THE MEETING**

The meeting may be attended only upon official designation. Participants should complete the attached Form A and B (if applicable) and send them, together with an abstract of approximately 300 words to the appropriate national authority (Member State's Mission in Vienna, Ministry of Foreign Affairs or National Atomic Energy Authority) for subsequent transmission to the IAEA not later than 15 January 2011, with copies e-mailed to Scientific Secretaries Mr. Victor Inozemtsev (V.Inozemtsev@iaea.org) and Mr. Xuxin Zou (X.Zou@iaea.org)). The abstracts should summarize the content and principal conclusions of the paper.

The authors will be notified about the acceptance of their paper(s) and the preliminary programme will be issued by 1 March 2011.

Upon arrival, during registration at the meeting, the authors are requested to provide a CD with their presentations (in MS PowerPoint) and papers (in MS Word). Papers should be formatted according to standard IAEA rules for further official IAEA publication. Requirements for paper formatting, as well as practical details for travel, accommodation, etc, will be given at the TM pages on the IAEA web-site (<http://www-pub.iaea.org/MTCD/meetings/Announcements.asp?ConfID=41221>) and the HOTLAB web-sites (<http://hotlab.sckcen.be/>).

#### **V. VENUE AND ACCOMMODATION**

The meeting will be held at the: Congress Centre Smolenice SAS, located in a castle near Bratislava, Slovakia (<http://www.kcsmolenice.sav.sk>).

Accommodation:

Castle Smolenice:

9 single - rooms, 29.87 EUR/night  
16 double - rooms, 59.75 EUR/night  
7 triple - rooms, 69.71 EUR/night  
2 four - rooms, 79.67 EUR/night  
5 apartments, 86.30 EUR/night

Hotel Solmus (2km to castle Smolenice) (<http://www.hotelsolmus.sk>):

23 double - rooms 35 EUR/night (one person)  
55 EUR/night (two persons)  
2 apartments 85 EUR/night

One day of the meeting will be set aside for a technical visit of the Interim Spent Fuel Storage Facility in Jaslovske Bohunice (storage pools + inspection stand). Participants should send passport number, birth day and full address for permission.

Designated participants who require a visa to enter Slovakia should submit the necessary application form in due time to the nearest diplomatic or consular representative of Slovakia.

## **VI. EXPENDITURES**

In accordance with the established rules, Governments or other national authorities are expected to bear the travel and other costs of designated participants in the Technical Meeting. Limited funds are, however, available to help cover the cost of participants from Member States eligible to receive technical assistance under the Agency's Technical Cooperation Programme. Such assistance can be offered, upon specific request, to one participant per country provided that, in the Agency's view, this participant will make an important contribution to the meeting. The application for financial support should be made at the time of designation of the participant.

Please note that compensation is not payable by the Agency for any damage to or loss of the experts' personal property. However, for the period of their engagement with the Agency, including travel between their residence and the duty station, the designated experts will be covered under the Agency's insurance policy for permanent total disablement or death resulting from service incurred accidents or illness up to an amount of € 100,000, for permanent partial disablement resulting from service incurred accidents or illness up to a percentage of € 100,000 and for medical expenses up to an amount of € 20,000 plus € 10,000 for supplementary travel and accommodation expenses in case of illness or injury resulting from service incurred accidents or illness, in accordance with the terms of the Agency's relevant insurance policy.

## **VII. WORKING LANGUAGE**

The working language of the meeting will be English. All communications, abstracts, and papers must be sent in English.



**FORM A**  
**651-T1-TM-41211**



## **INTERNATIONAL ATOMIC ENERGY AGENCY**

### **Technical Meeting**

**on**

**“Hot Cell Post Irradiation Examination & Pool-side Inspection of Nuclear Fuel”**  
**23-27 May 2011**  
**Smolenice, Slovakia**

To be sent to competent official authority (Ministry of Foreign Affairs, National Atomic Energy Authority) for transmission to the International Atomic Energy Agency, Vienna International Centre, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria

## **PARTICIPATION FORM**

**A. DEADLINE FOR APPLICATION: 15 January 2011**

Family name:	All initials of given name:	Mr. Ms.
Institution:	Full address:	For urgent communications please indicate: Phone No.: Telefax No.: E-mail:
Nationality:	Designating government or organization:	
Mailing address (if different from address of institution):		

Do you intend to present a paper?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
Title of Paper .....		
.....		
An abstract of my paper is attached?	YES <input type="checkbox"/>	NO <input type="checkbox"/>



**FORM B**  
**651-T1-TM-41211**



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## Technical Meeting

on

**“Hot Cell Post Irradiation Examination & Pool-side Inspection of Nuclear Fuel”**  
**23-27 May 2011**  
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## FORM FOR SUBMISSION OF A PAPER

**A. DEADLINE FOR APPLICATION: 15 January 2011**

TITLE OF THE PAPER		
AUTHOR(S) INITIAL(S) AND FAMILY NAME(S)	SCIENTIFIC ESTABLISHMENT(S) IN WHICH WORK HAS BEEN CARRIED OUT	TOWN/COUNTRY
1.		
3.		
3.		
AUTHOR WHO WILL PRESENT THE PAPER		Mailing Address:
Mr./Ms.		
Initial(s):		
Family Name:	For urgent communications please indicate: Telefax No.: E-Mail:	Telex No.:
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TO PUBLISH THE ABOVE-MENTIONED PAPER, AND CERTFY THAT NO OTHER RIGHTS HAVE BEEN GRANTED WHICH COULD CONFLICT WITH THE RIGHT HEREBY GIVEN TO THE AGENCY.		
DATE:	(SIGNATURE OF MAIN AUTHOR)	