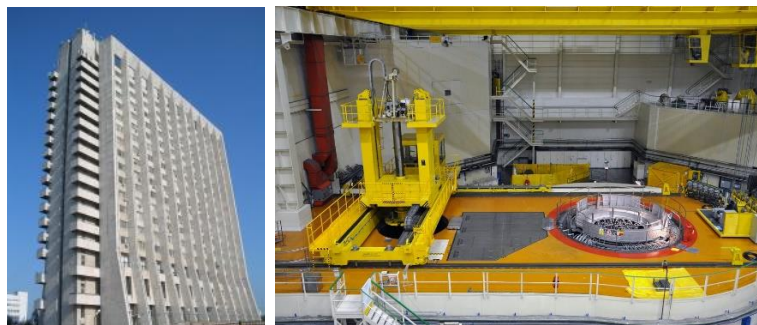# WANO Moscow Centre Workshop:
VVER Reactors fuel cycle extension.
6 - 10 December 2021, Moscow, Video Conference

WANO Moscow Centre is preparing for an international workshop dedicated to exchanging experience and knowledge accumulated by utilities and nuclear power plants - WANO members in the area of VVER reactors fuel cycle extension. The working meeting to be conducted in compliance with WANO MC working plan for 2020.

The goal of the working meeting

To exchange experience in the area of NPP with VVER reactors modernization and fuel cycle extension.

Topics for discussion

1. Review of the operating VVER NPPs fuel cycle extension experience gained by WANO members;
2. Utilities plans for fuel cycle extension;
3. Key parameters and features of different fuel cycle extension options.
4. Economic reasons (goals) for VVER fuel cycle extensions;
   - Increase of the fuel campaign relevant to increase of the service interval between outages.
   - Increase of the fuel burnup
   - Fuel cycle extension and improvement of the VVER maneuverability (PRO's and CON's)
   - Fuel cycle extension and reactor core power uprate (challenges and trades).
   - Reduction of the liquid and solid radioactive wastes (use of burnable absorbers in new fuel)
5. Safety analysis for fuel cycle extension.
   - Analysis of technical specifications, normal operation limits and engineering safety factors
   - The process of interaction with fuel designers and suppliers, regulatory authorities (National and International)
6. Change of operating modes, specifications and instructions.
   - Introduction of new fuel types and relative changes in I&C systems,
   - Change of operating modes and instructions.
   - Changing the power peaking factors restrictions (pin peaking, offset, DNBA etc.)
7. The change of the reactivity control and management due to fuel cycle extension. Use of the new neutron absorber materials for control rods and burnable absorbers.
8. Radioactive waste management (spent fuel management and rad waste management).
   - Storage and transportation
9. Change of the Control Room operators workload due to fuel cycle extension and relative measures;
10. Plans and experience in implementation of the new fuel types;
11. Fuel manufacturer warranty conditions fulfillment for extended campaign and for transitional fuel cycles (mixed campaign with old and new fuel).

Target audience

WANO Moscow Regional Center invites experts from utilities and nuclear power plants, design, engineering and technical support organizations, that are members of WANO (one participant from utility/NPP), as well as representatives of other WANO Regional Centers, NPP operators having experience in the area of VVER reactors fuel cycle extension to participate and share their experience.

Working Language Russian and English. WANO MC will provide interpretation.

Registration

Registration of the participants will be closed **on November 20**, **2021** (**12:00 GMT**). Please send completed registration form to coordinator's email address (emails: soldatov@wanomc.ru и tatarinova@wanomc.ru).

Preliminary Workshop Agenda

December 6 Monday	9:00 Check of the connection. Opening of the Workshop 10:00-13:00 Presentations of the Workshop participants
December 7 - 9 Tuesday	09:00-13:00 Presentations of the Workshop participants
December 10 Friday	09:00-13:00 Presentations of the Workshop participants 13:00 Workshop closing ceremony

Features

Workshop will be conducted as a videoconference. Minimum experience of using of computer is required for participants. The necessary requirements for the organization of the communication channel and the minimum requirements for the PC are given in Appendix 1.

Checking of communication channel, videoconference performance, introduction of participants and discussion of general rules for conducting videoconferencing will be held a week before workshop. We recommend you to use support of IT department of your organization to arrange communication channel.

Dress code Business casual

Presentations

All participants should make a presentation on the above topics to share experience and issues of the represented organization. Presentation together with discussion shall not take more than 30 min. In order to provide accurate SIMULTANIOUS translation, we are kindly ask participants to provide speakers notes (key thesis of your presentation) or speech text with you presentations to WANO MC.

The electronic versions of the presentations (MS Power Point slides in Russian and/or in English) should be sent to the Workshop coordinators before **November 27, 2021.**

Cancellation of Participation

Should you be unable to attend the Workshop (after having registered) please be so kind as to let us know as soon as possible.

WANO-MC coordinators

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Video Conference Requirements

System requirements

- An internet connection – broadband wired or wireless (3G or 4G/LTE)
- Speakers and a microphone – built-in or USB plug-in or wireless Bluetooth
- A webcam or HD webcam - built-in or USB plug-in
- Or, a HD cam or HD camcorder with video capture card

Supported operating systems

- macOS X with macOS 10.7 or later
- Windows 10. **Note**: For devices running Windows 10, they must run Windows 10 Home, Pro, or Enterprise. S Mode is not supported. Windows 8 or 8. Windows 7. Windows Vista with SP1 or later. Windows XP with SP3 or later.
- Ubuntu 12.04 or higher
- Mint 17.1 or higher
- Red Hat Enterprise Linux 6.4 or higher
- Oracle Linux 6.4 or higher
- ArchLinux (64-bit only)

Supported browsers

- Windows: IE 11+, Edge 12+, Firefox 27+, Chrome 30+
- Mac: Safari 7+, Firefox 27+, Chrome 30+
- Linux: Firefox 27+, Chrome 30+

Processor and RAM requirements

- Processor - Dual Core 2Ghz or Higher (i3/i5/i7 or AMD equivalent)
- RAM - 4Gb

Recommended bandwidth for webinar attendees:

- For 1:1 video calling: 600kbps (down) for high quality video and 1.2 Mbps (down) for HD video
- For screen sharing only (no video thumbnail): 50-75kbps (down)
- For screen sharing with video thumbnail: 50-150kbps (down)
- For audio VoiP: 60-80kbps (down)