

Possibilities offered by WANO-MC in supporting emergency management at VVER type plants



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SAM Project: Background

WANO Post-Fukushima Commission:

“The full focus of WANO since its formation has been accident prevention, and no procedures were in place to address nuclear response or mitigation”.

Therefore, WANO must shift from a focus on accident prevention to a focus on both prevention and mitigation.



SAM Project: Background

- WANO Post-Fukushima Commission's Recommendation No.1 was to expand the scope of WANO programmes to address topics including, among other things, severe accident management (SAM).
- Recommendation No.1 resulted in the launching of the SAM Project.
- Overall responsibility for the SAM Project was delegated to the WANO Moscow Centre.



SAM Project: Background

The SAM Project Team was established in April 2012.

The Project Team included 17 members: WANO staff from three Regional Centres, the London Office and at least one industry expert from each WANO Regional Centre.



Purpose of the SAM Project

The purpose of the SAM Project was to:

- expand the scope of WANO programmes to include severe accident management, and
- establish a worldwide standard for performing station and corporate assessments in the area of severe accident management.



SAM Project Deliverables

The SAM Project was completed on December 26, 2012. The Final Report on the SAM Project includes the following Project deliverables:

- SAM Performance Objectives and Criteria for station peer reviews;
- SAM performance objectives and criteria to be added to the “PO&Cs for WANO Corporate Peer Reviews”;
- A “How to Review SAM” guidance for station and corporate peer reviewers;
- Definition of a common basis for identification of good practices related to development and implementation of the SAM program at individual plants.



Structure of the proposed SAM PO&Cs

SAM.1 SAM MANAGEMENT AND LEADERSHIP

SAM.2 SEVERE ACCIDENT MANAGEMENT PROGRAMME

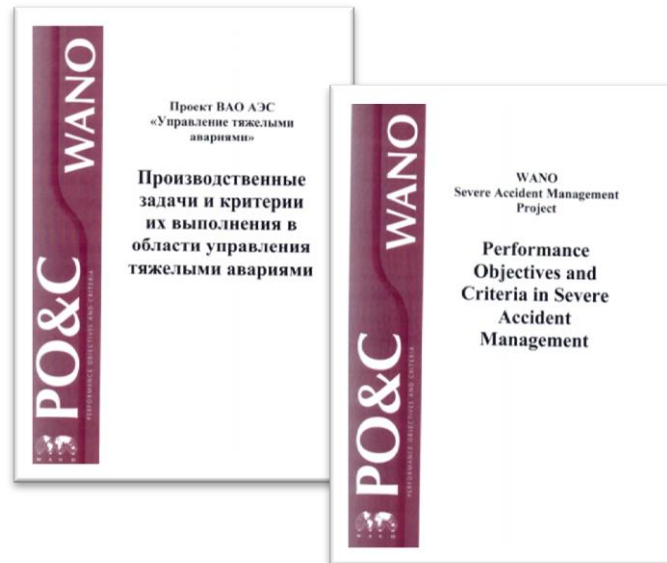
- ➔ Objectives of the SAM program
- ➔ Development and implementation of SAM strategies
- ➔ Documentation
- ➔ Staffing, Qualification and Training
- ➔ Facilities and Equipment

SAM.3 SEVERE ACCIDENT RESPONSE



Forthcoming activities on SAM Project

- WANO Governing Board has recommended NPPs to carry out self-assessment (SA) in the area of SAM by October 2015.
- The base for SA - SAM PO&C and “How to Review SAM” guidance that were sent by WANO-MC to Companies/Stations.



WANO-MC activities-2013 on SAM

- WANO-MC Workshop on SAMG development, implementation and training at WANO-Moscow Center Member Plants: 25-28 March 2013, Kiev (Ukraine), 28 participants from 10 operating organizations of WANO-MC
- WANO-MC Workshop on «Corium Localization Following VVER Reactor Severe Accident» : Kozloduy NPP (Bulgaria), 36 participants from 9 operating organizations of WANO-MC, managers and specialists representing scientific companies, 8 - 12 July 2013



WANO-MC activities-2013 on SAM (cont.)

- **Board meeting of the WANO-MC Technical Directors/Chief Engineers (1-3 October 2013, Budapest, Hungary). 45 participants from all 11 OO of WANO-MC.**
- **Topics for discussions:**
 - SAMG content including multi-unit effect, entrance criteria for SAMG, I&C for SAM, full scope simulator upgrade for SAM, WANO SAM Project.
 - Retention of the corium following VVER Reactor Severe Accident (SA): possible design solutions for in-vessel retention of the corium; possible design solutions for ex-vessel cooling and stabilizing of the corium; examples of design solutions implementation related to the in-vessel retention and ex-vessel cooling and stabilizing.
- **Minutes of the Board meeting:**
 - Within the WANO MC peer reviews, the SAM Programmes shall be reviewed based upon the EP and SAM PO&C.



Expected prospects

In particular, WANO-MC expects WANO Regional Centres to provide their conclusions on the following issues:

- proper alignment between EP and SAM;
- whether SAM should be merged with EP or be a stand-alone review area, particularly in the new PO&Cs developed by WANO;
- inclusion of SAM in the area review plans, addition of SAM experts to peer review teams;
- changes to WANO programs which might be necessitated by the new SAM PO&Cs.



Expected prospects: Incorporation of SAM into WANO programs

How we (WANO MC) see incorporation of severe accident management into all four WANO



Expected prospects: Incorporation of SAM into WANO programs

As the main deliverable, the SAM Project Group has developed performance objectives and criteria for severe accident management. This would contribute to incorporation of severe accident management into all four WANO programmes in the following way:

➤ **Peer reviews:**

Severe accident management would become a separate area to be reviewed on WANO peer reviews.



Expected prospects: Incorporation of SAM into WANO programs

➤ Technical Support and Exchange:

Stations would host **Technical Support Missions** based on issues and weaknesses identified in the SAM-related AFIs. Besides, **operator exchanges** could be arranged to assist WANO members in meeting the SAM-related performance objectives and criteria. Furthermore, strengths and beneficial practices in SAM observed during peer reviews could be disseminated to WANO members as **Good Practices**.



Expected prospects: Incorporation of SAM into WANO programs

➤ Operating Experience:

Whenever applicable, the use of SAM-related SOERs, SERs, JITs and Hot Topics might be reviewed during peer reviews.

➤ Professional and Technical Development:

Based on SAM-related AFIs, strengths and beneficial practices identified during peer reviews, WANO Regional Centres would arrange **workshops, conferences, seminars, expert meetings and training courses** for WANO members to enhance their professional knowledge and skills in severe accident management.



RCC Project

Regional Crisis Centre of the WANO Moscow Centre (RCC)



RCC Project: Background

- Recommendation No. 2 of PFC: Development of the world-wide emergency response strategy.
- August 30, 2011 WANO-MC seminar on “Stress-tests performed at the nuclear power plants of the WANO Moscow Region”: suggestion was made to establish, a Regional Crisis Centre (RCC) for the nuclear power plants with VVER reactors to support decision making during severe accidents.



Regional Crisis Centre tasks and goals

- To provide advice and technical assistance in the event of a site area emergency, general site emergency at WANO MC VVER plants as well as spreading the information on safety relevant events at NPPs among its members.
- The RCC forms a common pool of information and expertise to ensure the response of OPAS team in the event of foreign operational utility or nuclear power plants seeking technical support from a utility or plant.



Principles of the RCC operation

Principle No.1: Continuous Readiness

Principle No. 2: Information Flow Optimization

Principle No. 3: Prompt Notification

Principle No. 4: Confidentiality

Principle No. 5: Expert Support

Principle No. 6: Providing Logistical, Materiel and Technical Support

Principle No. 7: Using Accumulated Knowledge

Principle No. 8: Conducting Exercises and Drills

Principle No. 9: Voluntariness



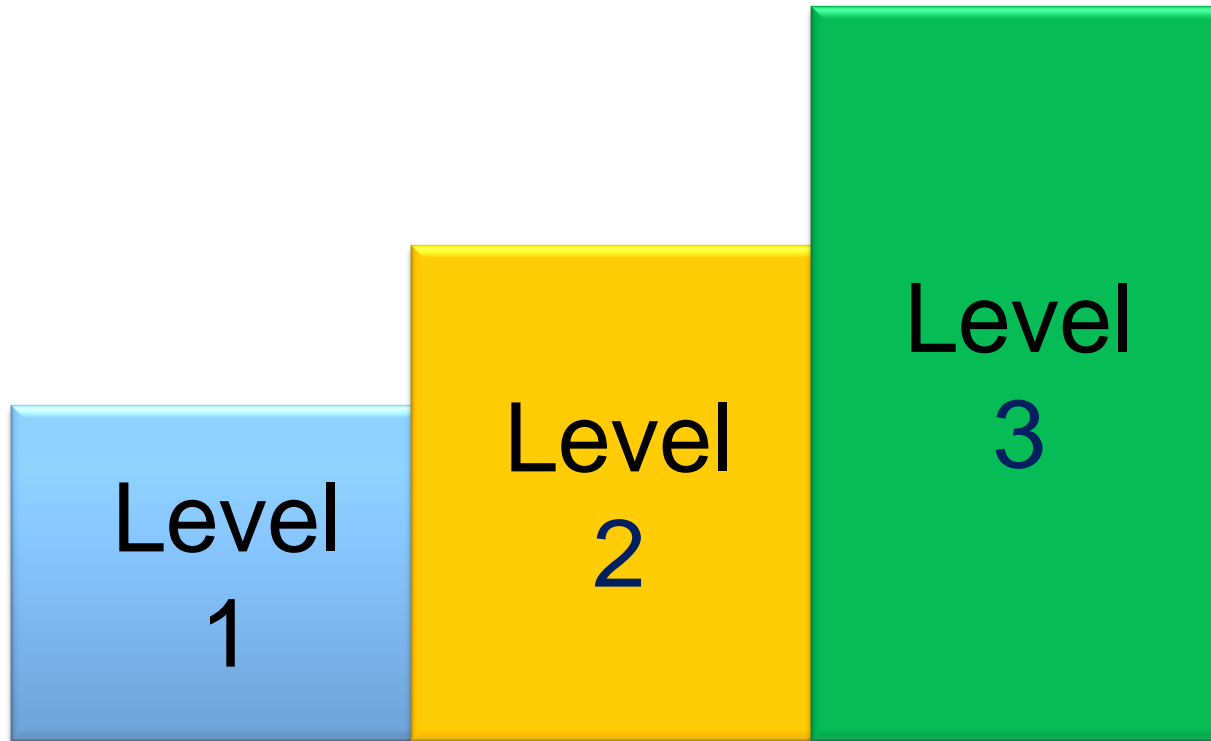
Operation modes of the RCC



- Routine activity
- High alert
- Emergency situation



The levels of participation of utilities/plants in the RCC



Differences in:

- requirements in national laws and regulations
- technical capabilities



The levels of participation of utilities/plants in the RCC

Level 1 - Finland, Czech Republic, Slovakia, Hungary, Ukraine, Bulgaria

Level 2 – Iran, China

Level 3 – Russia, Armenia

no decision made so far: India



RCC status as of November 2013

- RCC Regulations were approved by the WANO-MC GB
- Procedure for information exchange among RCC participants was approved by WANO-MC and Rosenergoatom
- Procedure for RCC operation was developed
- Bilateral agreements were concluded between WANO-MC and Loviisa NPP(Finland), JSC Concern Rosenergoatom (Russia), Paks NPP (Hungary), JNPC/Tianwan NPP(China), NAEK “Energoatom” (Ukraine), Armenian NPP (Armenia), Kozloduy NPP (Bulgaria), CEZ (CZECH REPUBLIC), NPPD OF IRAN (IRAN)



RCC status as of November 2013 (cont.)

- Pilot operation started – June 2013
- On March 14, 2013 the international exercises with a simulated event at the Loviisa NPP (Finland) were conducted in the framework of the RCC
- On September 18-20, 2013 the international exercises with a simulated event at the Kalinin NPP (Russia) were conducted in the RCC framework



International exercises with a simulated event at the Loviisa NPP and Kalinin NPP . Lessons learned.

- Training (on a regular basis) is a key to success**
- Developed forms were useful**
- Additional information by phone or video conference is necessary to create a good understanding of the situation**
- Expert consultation can not be based on the information from forms – a dialogue is needed**
- The process of collecting information, analyzing and making a short summary is time consuming**
- At least two persons are needed for the WANO RCC contacts during training/accident**
- The fast response is challenging – the situation can change quickly**



Forthcoming activities

- **Bilateral Agreements to be concluded with all utilities/NPPs:**
 - **Agreement finalization on RCC with Slovenske Elektrárne**
 - **Agreement with Kudankulam NPP should be concluded**
- **Comprehensive RCC exercises (in 2014 - at Bulgarian, Slovakian and Russian NPPs)**
- **Working group meetings on RCC**

THANK YOU!

