



*IAEA TM/Workshop on "Erosion-Corrosion including Flow Accelerated
Corrosion and Environmentally Assisted Cracking Issues in NPPs »
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Improvement of erosion-corrosion resistance of equipment & pipelines at Russian NPPs

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Russian NPPs in operation



Reactor unit type	WWER-440	WWER-1000	RBMK-1000	BN-600	EGP-6	Total number
Number of units	6	9	11	1	4	31
Installed capacity, MW	2 594	9 000	11 000	600	48	23242



Russian nuclear power units - Operational life extension

Operational lifetime has been extended for 11 Units 4 808 MW

Power Units in PLEX phase

Beloyarsk-3	- 2 Q 2010
Novovoronezh-5	- 4 Q 2008
Kursk-2	- 1 Q 2009
Kursk-3	- 4 Q 2013
Kursk-4	- 4 Q 2015
Leningrad-3	- 4 Q 2009
Leningrad-4	- 4 Q 2011
Smolensk-1	- 4 Q 2012
Kola-3	- 4 Q 2011

9 Units at 6 NPP sites 8 040 MW
sites

Power Units approaching the PLEX phase

Kola-4	- 4 Q 2014
Smolensk-2	- 2 Q 2015
Balakovo-1	- 4 Q 2015
Kalinin-1	- 2 Q 2014

4 Units at 4 NPP sites 3 440 MW



Objectives of the activities focused on solution of erosion-corrosion resistance issues

- ▶ **1) Prevention of E/C-caused damages to equipment & pipelines at Russian NPPs.**
- ▶ **2) Control & diagnostic activities cost optimization.**
- ▶ **3) Cost reduction for equipment & pipelines repair activities at Russian NPPs.**



E/C prevention activities performed at Russian NPPs

- 1. “Comprehensive programme for prevention of ruptures and improvement erosion-corrosion resistance of NPP equipment & pipelines”, № AES PRG-550-K07 (approved in 2006)**
- 2. Corrective measures taken at Russian NPPs in connection with the Mihama event occurred 09.08.2004.**
- 3. Special programmes and activities being performed at Energoatom’s NPPs to resolve E/C-related issues.**



The Comprehensive Programme № AES PRG-550-K07

- ▶ **1. Development and certification of computer codes for calculation of local E/C rate in single-phase and two-phase flows.**
- ▶ **2. Will provide for scientific-engineering grounds and ensure development of practical solutions towards optimization of the control & diagnostic activities (determination of locations, scope and frequency of in-service inspections).**
- ▶ **3. To develop and adjust technical regulation documents related to base metal technical condition control and to equipment & pipeline (E&P) residual life evaluations (including metal chemical composition identification and strength analysis for E/C conditions).**
- ▶ **4. To establish databases comprising metal inspection results and E/C-induced damages of plant E&P.**
- ▶ **5. To develop and implement comprehensive computerized toolsets providing support to plant personnel regarding organization, planning and implementation of the control & diagnostic activities and to optimum decision making in the area of repair and substantiation of E&P life extension.**
- ▶ **6. To develop and implement E/C monitoring and E/C test modules at Kalinin NPP as a pilot plant.**



Organization of activities related to erosion-corrosion resistance improvement

