



4. Operating reliability of steam generators at WWER-440 and WWER-1000 NPPs

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This paper presents the deterioration analysis for the following elements in steam generators at WWER-440 and WWER-1000 NPPs

- studs and stud pockets of SG headers,
- SG header metal,
- welded joint between the primary circuit pipelines and SG headers,
- SG heat-exchanging tubes (SG HET)

The factors having an impact on SG HET deterioration being:

Conditions of SG operation,

Chemical properties of the turbine condensate, feed water and blowdown water,

Design features of steam generators,

Design features of the secondary equipment elements,

Composition and density of depositions on SG HET surface,

Efficiency of mechanical and chemical washings

The principal avenues for further enhancement of steam generator operating reliability being

- replacement of copper-bearing elements of the secondary circuit equipment with non-corrosive ones,
- preclusion of air inflows and service water leaks' in turbine condensers,
- preclusion of additional build-up of corrosion in the condensate-feeding circuit,
- optimization of water chemical properties in the secondary circuit,
- analysis of SG HET deterioration with dismantled steam generators,
- development and implementation of procedures for upgrading the reliability of eddy current inspections for SG HET,
- development of the tube bundles' inspection procedure using new devices and optical means,
- upgrading the procedure of slurry removal and chemical washing,
- development of software for SG operating life control,
- generation of a database for SG operating reliability monitoring