| **Working program** **for presence of REA expert in TAVANA Co. concerning the “Water chemistry monitoring and optimization in secondary circuit of NPP’s”****Expert from JSC VNIIAES****Nokolai N. Soldatov****09.12.2017 to 21.12.2017** |
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| Date | SUBJECT | Schedule/responsible |
| 8:30-12:30 | 14:00-17:00 |
| Sat | 09.12.17 | Introduction | * Introducing of the experts/participants
* TAVANA presentation on water chemistry regime in BNPP
* Giving presentation on Russian experience about water chemistry regime by Mr. Nikolai N. Soldatov
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| sun | 10.12.17 | Introduction to water chemistry regimes in secondary circuit of nuclear power plants(Presented by: Mr. Nikolai N. Soldatov) | * General concept of water chemistry regimes in secondary side
* Main causes to change the current regime
* Limitation to change the regime
* Guidelines, Criteria and standards in the field of water chemistry of secondary circuit of NPP
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| Mon | 11.12.17 | Historical development of the secondary coolant regimes in the word(Presented by: Mr. Nikolai N. Soldatov) | * Russian nuclear power(WWER)
* Western Nuclear power(PWR)
* Russian experience(specially VNIIAES) in water chemistry regime improvement in Balakovo , Rostov, Kalinin, Novovoronezh )
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| Tue | 12.12.17 | The effect of water chemistry regimes on aging and integrity of NPP’s equipment and pipelines (Presented by: Mr. Nikolai N. Soldatov ) | * Degradation mechanisms in secondary side
* Corrosion mechanisms( specially FAC)
* Steam generator(SG) integrity
* Condenser integrity
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| Wed | 13.12.17 | Lateral aspects of changing water chemistry regims(Presented by: Mr. Nikolai N. Soldatov ) | * Operation feedbacks( potential effects on main design characteristics of WWER secondary system)
* The results of using new regime particularly regarding mitigation of degradation mechanisms.
* Economic and environmental aspects
* Blowdown operation mode
* Waste water treatment
* Performance of condensate polishing system
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| Thu | 14.12.17 | * conclusion
 | * discussion
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| Fri | 15.12.17 |  |  |  |
| Sat | 16.12.17 | Method of selecting the best secondary water chemistry regimes(Presented by: Mr. Nikolai N. Soldatov ) | * Reagents selection and concentration
* Resin selection
* Physicochemical model of mass transfer of corrosion products in secondary circuit by VNIIAES
* Determination of the main parameters required to be monitored
* Calculation method of pHT based on pH25oC
* Calculation method of reagent concentration
* Morphine and amines decomposition mechanisms
* The effect of copper alloys in secondary circuit on water chemistry regime
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| Sun | 17.12.17 | Investigation on the extent of change in NPP’s secoundary circuit process based on change in water chemistry regime(Presented by: Mr. Nikolai N. Soldatov)  | * Ione exchange resin( anionic and cationic)
* The effect of change in water chemistry regime in NPP’s secondary circuit process on:
* equipment design and piping arrangement.
* chemistry control instruments and sampling points,
* Operational condition and instruction
* Waste water disposal
* cost of operation and etc.
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| Mon | 18.12.17 | Cost estimation for improvement water chemistry regime in NPP’s based on relevant experiences.(Presented by: Mr. Nikolai N. Soldatov) | * Operation Cost
* Engineering Cost(Design And Modernization Cost)
* Raw Material Cost Estimation(Resin and Reagent)
* Instrumentation Improvement(If Necessary)
* Waste Disposal Cost Estimation
* etc.
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| Tue | 19.12.17 | Modernization of the monitoring system of the secondary circuit’s chemistry in Balakovo NPP(Presented by: Mr. Nikolai N. Soldatov) | * The reasons and justification for modernization of the monitoring system of the secondary circuit’s chemistry in Balakovo NPP
* The description of the monitoring system of the secondary circuit’s chemistry in Balakovo NPP:
* online Monitoring system of PH
* online Monitoring system of EC
* online Monitoring system of Oxygen
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| Wed | 20.12.17 | Monitoring system of the secondary circuit’s chemistry in newer generations of VVER 1000(Presented by: Mr. Nikolai N. Soldatov) | * The difference between the monitoring system of the secondary circuit’s chemistry in BNPP and newer generations of VVER 1000
* The details of the monitoring system of the secondary circuit’s chemistry in newer generations of VVER 1000 :
* online Monitoring system of PH
* online Monitoring system of EC
* online Monitoring system of Oxygen
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| Thu | 21.12.17 | * conclusion
 | * discussion
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| Note: All subjects should be presented separately (in English version). |