| **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 | |
| 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 | |
| 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 ) | |
| 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 | |
| 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 | |
| Thu | 14.12.17 | * conclusion | * discussion | |
| 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 | |
| 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. | |
| 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. | |
| 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 | |
| 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 | |
| Thu | 21.12.17 | * conclusion | * discussion | |
| Note: All subjects should be presented separately (in English version). | | | | |