The highly demineralised water system GC

The highly demineralised water system GC includes three systems:

- system of permeate ion exchange purification (GCF);
- regeneration and washing system of ion exchange filters (GCP);
- system of washing water removal and neutralization (GCR).

System of permeate ionexchange purification (GCF) provides highly demineralised water preparation for initial filling of the primary and secondary circuits of NPP, make-up throughout the operational period, for own needs of water preparation systems.

The permeate after the reverse osmosis of the second stage from desalted water GDF tanks goes to MB, that is filled with strong acid cation exchanger and high basic anion exchanger, for high demineralization. One filter works, the other is back-up.

Table 1 – Diagnostic quality parameters of desalted water

Parameter	Control level
pH level	5,5-8,5
Chloride-ion concentration, mg/dm^3, no more	0,005
Silic acid concentration, mg/dm^3, no more	0,015
Specific electrical conductivity, mcSm/sm, no more	1,2
Common organic carbon concentration, mg/dm^3, no more	0,1

The highly demineralized water after MB is directed to the system of purge water LCU to the own needs tanks of the system of filters regeneration and washing (LDP), to the secondary circuit WCR correction system (LDN), STG laboratories, ACC system QU to the system of washing water removal and neutralization (GCR) and to the system of centralized supply by chemical reagents (QC).

MB switches off for ion exchangers regeneration, when the conductivity of the highly demineralized water at the output increases by more than 0,1 mcSm/sm. The back-up filter is turned on at the same time. Before that the reverse back-up filter is washed by desalted water (permeate after reverse osmosis of II stage) until the natrium concentration in the filtrate is less than 10 mcg/dm^3 and conductivity - less than 0,1 mcSm/sm.

MB regeneration is provided by GCP system. Cation exchanger regeneration is carried out by sulphuric acid (6% solution), anion exchanger regeneration is carried out by natrium hydroxide 5% solution into the MB containment.

The system of washing water removal and neutralization (GCR) provides neutralization and removal to the environment of the following waste waters:

Regenerative and washing water of the iron removing filters and turbine concentrate desalting filters (after control of activity), and purification of common plant draining condensates (providing ethanolamine is absent in regenerative water);

- Chemical washing water of ultrafiltration and membrane purification plants;
- Regenerative and washing water of MB of turning gear device;
- Evaporator condensate of the system of drain water processing KPF;
- Drainages and overflows of turning gear device system tanks.

Waste regenerative and washing waters before neutralization are averaged with mixing by pumps and pressurized air. At the air processing ammonia is eliminated and hydrazine is destructed simultaneously. Neutralization is carried out by sulphuric acid and natrium hydroxide supply.

There is pH value measurement for quality control of waste water of GCR system. If pH value in waste regenerative and washing water fluctuate within 6,5-8,5, waste water is transferred to the mixing with cooler purge water.