System of automatic control of primary circuit WCR KUB

System of automatic control (ACC) of primary circuit WCR provides automatic on-line control of the primary circuit WCR chemical parameters.

The functions of KUB system are:

- sampling from the primary circuit;
- sample preparation and transport for automatic control of ^{10}B nuclide concentration;
- reduction of parameters (temperature and pressure) in the sampling lines;
- protection of chemcontrol devices from high pressure and temperature;
- measurement of of the primary circuit WCR chemical parameters;
- differentiated reset of drainings in accordance to chemical composition.

In ACC operational process there are control of the next parameters:

- from the reactor core – ^{10}B nuclide, chloride-, fluoride-, sulfate-ions, potassium, lithium, sodium, ammonia concentration;
- after refrigerator of purge water – specific electrical conductivity, concentration of dissolved oxygen and hydrogen, chloride-, fluoride-, sulfate-ions, potassium, lithium, sodium, ammonia concentration;
- after MB of KBE system – specific electrical conductivity, chloride-ion concentration;
- after pumps of KBA system – specific electrical conductivity, concentration of dissolved oxygen, chloride-ion concentration;
- from pressure compensation system, from the main circulation pipelines system – ^{10}B nuclide concentration .

For on-line control of low anion and cation concentrations there is ionic chromatography in the system.

The system provides:

- primary cooling of the sample;
- sample transport from sampling point to the sample preparation complex;
- reduction of sample parameters (temperature and pressure) in the sample preparation complex;
- control parameters measurement and transfer of information to operator.
- The sample preparation complex provides:
- reduction of temperature and pressure;
- thin mechanic sample purification;

- coolant flow distribution to the ACC devices;
- regulation of coolant consumption through ACC devices;
- automatic blocking of sample supply, if sample pressure more then 0.6 MPa and temperature more then 40°C;
- hand sampling for laboratory chemcontrol of the primary circuit coolant and for control of automatic device indications;
- signals accumulation and transfer from ACC devices to operator.