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Development of the built-in primary sodium purification system for the

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To purify primary sodium in the advanced BN-1200 reactor plant, a purification system with cold traps has been used that are located in the reactor vessel (in-built purification system). Such decision has excluded external communications of the auxiliary system with radioactive sodium and respectively a possibility that sodium will outflow to compartments outside the reactor.
The sizes of cold traps located in the reactor are small that has limited the sodium flowrate through them, impurity storage capacity, and has made it necessary to replace traps in the course of reactor plant operation. Cold traps include such main components of the conventional external purification system as sodium communications, a portion of the cooling circuit, flow meter devices, and electromagnetic devices (a pump and throttle pump) to ensure sodium circulation and to control the sodium flowrate. In the course of development, options have been considered to cool traps with argon at the pressure of 1.5 MPa, liquid sodium, and gallium.
To validate operation of electromagnetic devices for the cold trap, a package of research activities and R&D activities has been done:
- Thermal irradiation studies have been done of sample electrotechnical materials intended for the electromagnetic pump and throttle pump.
- Mockups of the electromagnetic pump and throttle pump have been manufactured and tested.

Country/Int. Organization

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