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DECAY HEAT REMOVAL SYSTEM IN THE SECONDARY CIRCUIT OF THE SODIUM-COOLED FAST REACTOR AND EVALUATION OF ITS CAPACITY

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Decay heat removal system (DHRS) option for the secondary circuit of the sodium-cooled fast reactor (SFR) by means of air cooling the outer surface of piping and equipment of heat removal loops of the SFR secondary circuit is proposed.

The DHRS option under consideration implies case mounted around main piping and equipment of heat removal loops of the SFR secondary circuit and divided into a number of sections connected in parallel to each other with an exhaust chimney. This case performs certain containment function under normal operation condition, and it is arranged a natural circulation of air through the gap between piping and equipment of the secondary circuit and this case under emergency cooling modes by opening the air dampers.

Effectiveness of this decay heat removal system is evaluated by using specially developed computational code that allows modeling transient emergency cooling modes and optimization of the DHRS characteristics to reduce the maximum value of coolant temperature in these transients. Results of effectiveness evaluation for the proposed decay heat removal system applied to fast reactor with sodium coolant are presented.

Country/Int. Organization

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