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Modeling technologies of fuel cycles

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There exist different variants of organizing the closure of nuclear fuel cycle (CNFC) depending on fast reactor type, fuel types, station or centralized allocation of closed nuclear fuel cycle stages. Many processes and engineering solutions used for implementation of chosen technologies for re-processing spent fuel are little-studied. One of the ways to verify and estimate engineering solution is mathematical modeling of radiochemical technology which in the end will allow to optimize composite technological process in order to increase effectiveness and reduce cost.

The mathematical models for key processes of spent fuel reprocessing, fuel refabrication and radio-active waste managing are being developed in the frames of "Proryv" project for these purposes. Also codes VIZART and KOD TP to validate realizability and optimize parameters of CNFC pro-cessing lines are being developed. The codes use integrated library of technology models and allow to calculate material balance, create cyclograms, determine the most loaded parts of processing lines, estimate accumulation of fissile materials in devices and intermediate vessels, estimate the influence of control actions on technology process.

Country/Int. Organization

Russian Federation, 1) RFNC-VNIITF,
2) ITCP «PRORYV»

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