WWER-1000 ACCELERATED UNIT UNLOADING ACTIVATION TRANSIENT FEATURES

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For WWER-1000 operation at power level more than 75 % of nominal one ($N_{ном}$) in case of failure of safety important equipment, the direct activation of accelerated unit unloading (AUU) signal is initiated. This causes the designated control rod regulating group to be dropped into the core to rapidly depress the unit power for (~40 - 50) % of $N_{ном}$. When regulating group is dropped down, the negative reactivity is inserted into the core and subsequent transient takes place with power decreasing from initial power level to the new lower steady state one. For this transient the calculations of period and reactivity values are done for the beginning- and end-of-core-lifetime since both period and reactivity are the reactor safety important parameters. Additionally the WWER-1000 reactor power behavior is studied in time. As results of calculations shown for temperature reactivity coefficients, typical for the end-of-core-lifetime, the period value may be out of safety range and cause WWER-1000 scram. In the same time the calculation results of power and reactivity changes prove the WWER-1000 design operation conditions after AUU is activated and absence of scram initiation based on neutron-physical reactor parameters.

Keywords: reactivity, WWER-1000, regulating group, core.