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**TECHNIQUE OF ACCOUNT OF UNCERTAINTY OF NUCLIDE INVENTORY AND  
EFFECTIVE PART OF DECAY NEUTRONS IN SPENT FUEL**

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The problem of keeping and increasing of level of nuclear and radiation safety of nuclear power reactors is very depended on the issues of spent fuel management. And in connection with it I believe that it's important to study of accuracy of calculation and theoretical prediction of parameters of system and estimation of influence of an approximation's admissibility which are admitted on a design stage and observation of modes of operation on basic functional of safety.

In the submitted report they are considered the issues of a substantiation of initial condition of spent fuel assemblies of VVER - type reactors. The structure of VVER - type reactor inventory can be simulated successfully if we use the detailed information about an irradiation conditions and a neutrons spectra. However, the design decisions accepted for cooling pond of spent fuel are accepted for some set of fuel assemblies, which are differed by their real irradiation and possible by variety of initial structure. Therefore it is expedient to investigate essential uncertainty of calculated parameters and its influence on results of modeling.

The allocation of power yield of fission products decay varies poorly depending on burning. However safety of cooling pond can be essentially affected by uncertainty in structure of heavy nuclei is especial if the fuel containing plutonium. In the first uncertainty of calculated nuclides concentrations can make the significant deviation of value of the decay neutrons part in spent fuel and in the source of neutrons of spontaneous fission etc. In the second the uncertainty in burning out can affect balance between the multiplying ability and absorption value in spent fuel composition. And in addition to it deviations may be obtained in concentrations of nuclides – indicators, which can be used in fuel conditions analysis.

The technique of calculation of uncertainty is based on the sensitivity analyses algorithm, which use the ordinary perturbation theory. Main feature of this algorithm is that in this algorithms it is not used the ajoint functions.

The model of nuclides transmutations is described by rigid system of the ordinary differential equations as the kinetics in lumped parameters. Thus the deviations in sizes of an irradiation, describing a mode, are assumed rather small, that the structure of model was kept.

As a whole it is possible to note, that the application of the small perturbation theory allows us to construct techniques of the analysis of accuracy of approximations, which are accepted in design and operational software.

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