D. Pevec[+], E. Coffou[++], N. Limić[++] i N. Urli[++]

\+ Elektrotehnički fakultet, Zagreb

++ Institut "Rudjer Bošković", Zagreb

SOME PROBLEMS OF IN-CORE FUEL MANAGEMENT IN PWR´s

In-core fuel management deals with optimization of such parameters as fuel enrichment, number of fuel assemblies replaced in each cycle, fuel loading pattern and shuffling schemes, absorber management etc. By taking into account the results of out-of-core fuel menagement, one of the goals is to optimize all the parameters so that the cheapest energy generating costs are obtained without the violation of any safety-related constraints. Another goal is to optimize the utilization of the fissionable materials to insure the production of the maximum amount of energy from the available resources. The problem of optimization is a very complicated one and it is not possible to perform it in a single step. We made an attempt to decrease the power form-factor by the rotation of reloaded fuel assemblies at the beginning of the new fuel cycle. An algorithm and computer programme for the minimization of the power form-factor with an optimal k-profile have been developed and applied to different PWR cores (including that of NE Krško).

The results show that it is possible to flatten the power distribution in the core by reducing the apsolute power peak value as well as the local power peak factors, demonstrating the usefulness of the proposed method.