ENHANCEMENT OF EXISTING RBMK-TYPE REACTOR MONITORING SYSTEM FOR PREVENTION OPERATIONAL LIMITS VIOLATION.

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МОДЕРНИЗАЦИЯ ШТАТНОЙ СИСТЕМЫ КОНТРОЛЯ РЕАКТОРОВ ТИПА РБМК ДЛЯ ПРЕДОТВРАЩЕНИЯ ПРЕВЫШЕНИЯ ЭКСПЛУАТАЦИОННЫХ ПРЕДЕЛОВ.

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В докладе рассмотрены принципы и этапы реализаций системы предупредительной защиты реакторов типа РБМК для автоматического предотвращения превышения эксплуатационных пределов. Обсуждаются различные способы расчета уставок защиты с помощью программы ВЕТЕР.

Existing local control and protection systems (CPSs) of RBMK-type reactor cannot prevent automatically operational limits violation during many significant regims. At these events controlable reactor power reduction is one of the most simple way for prevention of limits violation. This action is the function of the preventive protection system (PPS). It is assumed that PPS will use two special computers and original instrumentation of central monitoring system for data transfer. The principle of feedback due to initial influence is used for providing sufficient data processing of PPS. The PPS signals are generate with high frequency (about 10 Hz) by the main computer by comparison of real detector signal and reference value, which depends of neighbour control rods or refuelling assembly position. These dependences are prepare by the auxilary computer with periodicity from one half to a few minutes.

The **BETEP** code algorithms are advancing now for calculation of these dependences. This code was developed for prediction and monitoring of spatial distribution of safety-related parameters (*) at on-power refuelling and control rods moving. Spatial decomposition of 3D full-scale problem into 2D full-scale problem and 3D local

problem for a some vicinity of perturbance entering point is the main idea of these algorithms. Usage of this assumption gives possibility of on-line monitoring at local region (7x7 channel) during on-power refuelling. During verification it was found that accuracy of **BETEP** algorithms are adequate for operational calculations (deviation from experimental and full-scale calculational data was found within 5%).

Some steps of PPS realization including **BETEP** algorithms are discuss.

(*) Safety-related parameters are channel power, linear heat rate, critical heat flux margin, graphite temperature.