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PROBABILISTIC SAFETY ANALYSIS RESULTS FOR BN REACTOR POWER UNITS

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Probabilistic safety analysis (PSA) is a constituent part of range of works aimed at BN power units safety assessment during operation (BN-600 and BN-800 reactors power units), lifetime extension (BN-600 reactor power unit), designing (BN-1200 reactor power unit). PSA reports are part of the document sets required to obtain appropriate Rostechnadzor licenses.
JSC "Afrikantov OKBM"together with General Designer and Scientific Supervisor has performed the following PSA Level 1 (PSA-1):
a) BN-600 and BN-800 reactors power units:
- PSA-1 for internal initiating events for power operation mode,
- PSA-1 for internal initiating events for shutdown reactor modes,
- PSA-1 for internal fires,
- PSA-1 for internal floods,
- PSA-1 for external hazards.
б) BN-1200 reactor power unit:
- PSA-1 for internal initiating events for power operation mode (preliminary).
General PSA goals are the following ones:
–power unit safety level assessment;
–recommendation development for power unit safety measures improvement.
First of all, PSA-1 was developed for internal initiating events for power operation mode. All following studies are based on models prepared within that PSA-1.
Within each of the PSA-1 studies, systems reliability analysis was performed, accident sequences were developed, human reliability analysis was implemented, database on initiating event frequencies and system component reliability indices was developed, integral probabilistic reactor power unit model was formed, quantitative analysis was performed including of importance, sensitivity and uncertainty analysis.
The PSA database on initiating event frequencies and component reliability indices is developed and updated based on the analyzed experience of BN-600 reactor power unit. For BN-800 and BN-1200 reactors power units PSA data analysis takes into account power units design distinctions.
At the present time JSC "Afrikantov OKBM"is continuing to improve all PSA models. Among other actions BN-600 and BN-800 reactors power units safety measures improvement based on Fukushima Daichi accident lessons learned and power units operating experience feedback update are taken into account. Probabilistic safety analysis Level 2 is being performed.

Country/Int. Organization

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