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RANDOM PERTURBATIONS IN THE PROPERTIES OF THE REACTOR ENVIRONMENT NOISE GENERATOR MATHEMATICAL MODEL

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Everyone knows that all reactor characteristics have uneven distribution over the reactor core. At the present time, very few calculations are carried out to take into account this unevenness, however, it is impossible to obtain absolute results, because this “Unevenness” is impermanent in time due to multiple factors. Empirical formulas obtained empirically are often used for simplification. As well as the created mathematical models which qualitatively describe the unevenness. Here we will demonstrate this by the example of noise generator

There was reviewed a one-dimensional reactor model, which greatly simplifies the modeling of statistical experiment. We consider a one-dimensional reactor as a flat plate.

In our research we have applied mathematical model named "high-altitude model", in relation to the RBMK reactor.

For the simulation of random variables we have used noise generator method, which is described mathematically as follows:

$$a_2 \frac{d^2x(t)}{dt^2} + a_1 \frac{dx(t)}{dt} + a_0 x(t) = b_1 \frac{d\xi(t)}{dt} + b_0 \xi(t) \quad (1)$$

All these factors are taken from the RBMK archives.

The following results were obtained on the basis of a mathematical model of the particles flow and the noise generator: The increase of the reactor’s size and the noise level leads to the expected value deviates from fundamental solution and the variance is characterized by the appearance of the peaks and moving them to the edges of the reactor.

Further, according to the archives there was built graphics 4 sections RBMK. In general, all the sensors show the same trend: the lower Expected value and the

large variance in extreme sections. This corresponds to the obtained data mentioned above.

There was made an attempt to determine the cause - why the variance of flow neutrons is so different. In this regard, the studies were conducted according to the dispersion of the sensor from location in the core. Also, analysis of the behavior of the sensor's signal over time was carried out, when we look at it the axial offset (Figure 8), we see that the system is clearly present vibrations, in this case, when the flow sections 1 and 2 is increased, the flows of sections 3 and 4 are reduced and vice versa, i.e. We clearly observe distortions field height.

To summarize, for the Expected value the low values are in the extreme sections, but for dispersion the small value is in the center and two characteristic peaks are closer to the edge of the reactor. In conclusion we should admit that for the simulation of random variables it is suitable to apply noise generator function that has been proven above.

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TECHNOLOGICAL SYSTEMS FOR THE POWER-GENERATING EQUIPMENT ECO-FRIENDLY SHUTDOWN

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National power economy modernization requires an effective system for the power-generating equipment eco-friendly shutdown. The problem of the power unit's eco-friendly shutdown is very complicated. In this research there were selected two basis technologies and considered a possibility of their combined appliance.