Contribution ID: **34** Type: **not specified**

OPTIMIZATION OF AUTOMATIC POWER CONTROL SYSTEM OF THE IBR-2M PULSED REACTOR

The IBR-2M pulsed reactor has been in operation in Dubna (Russia) since 2012. The IBR-2M is an upgraded version of the IBR-2, which was decommissioned in 2006 due to the end of its service life. Studies of the IBR-2M pulsed reactor showed that high (up to ~50 %) fluctuations of pulse energy correspond to a complex frequency spectrum of oscillations. In addition to the white noise component and a number of harmonic oscillations, it includes a significant low-frequency component with a period of 10 s. The low-frequency oscillations are interpreted as self-oscillations associated with the attenuation of the fast power feedback (PF) during reactor operation. One way to reduce the amplitude of self-oscillations is to optimize the parameters of automatic power control (AC). Optimization of the AC parameters is based on a model representation of the reactor dynamics as a pulsed AC system. The mathematical model of the IBR-2M dynamics makes it possible to analyze both power transients and noises in self-regulation (without AC) and automatic regulation (with AC) modes. To optimize the AC parameters, it is necessary to simulate the reactor operation when the AC system and the fast PF system work together. Optimization of parameters of the IBR-2M AC system made it possible to significantly reduce both the influence of random and deterministic reactivity fluctuations on pulse energy noises of the reactor. The work presents the main results of the study of the optimization of the AC system of the IBR-2M pulsed reactor.

Section

Energy and materials science (Section 2)

Primary author: DAVAASUREN, Sumkhuu (Frank Laboratory of Neutron Physics, JINR)

Co-authors: Dr PEPELYSHEV, Yuri (JINR); Dr ROGOV, Anatoly (JINR)

Presenter: DAVAASUREN, Sumkhuu (Frank Laboratory of Neutron Physics, JINR)

Track Classification: The V International Scientific Forum "Nuclear Science and Technologies": Energy and materials science (Section 2)