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### Research Article

## Thermal-Hydraulic Analysis of Coolant Flow Decrease in Fuel Channels of Smolensk-3 during GDH Blockage Event

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### Abstract

One of the transients that have received considerable attention in the literature is the break of a group distribution header (GDH). The coolant flow rate up of the pressure tubes and can result in multiple fuel channels being affected. This transient has been studied considering the Smolensk-3 RBMK NPP which distributes coolant to 40 - 43 fuel channels. To investigate the behavior of the reactor during a more realistic trend, one (affected) GDH has been schematized. Simulations were performed using the 0-D NK (neutron kinetic) model of the reactor. During the event, the mass flow rate is disturbed differently according to the location of the affected fuel channels (FC) in the schematization. The start time of the oscillations in mass flow rate to each FC. It was also observed that, during the event, the fuel rods in the affected GDH undergo first cladding rupture leaving the reactor to scram and shutdown of the affected GDH.

