

## **Hydro turbine mathematical models development for electromechanical transients study with frequency changes in the power system.**

*Gurikov O. V, Kabanov D. A.*

Kaplan and Francis turbine mathematical models of different detail level are developed. These mathematical models reproduce the steady state characteristics and dynamic behavior of full-scale hydro turbines in wide range of rotation speed, water flow, total head, guide vane and turbine blade position. This allows them to be used in study of electromechanical transients in the power system followed by frequency changes, including transients resulting to isolated operation of hydraulic units.

*Keywords: frequency, frequency regulation, speed governor, frequency governor, automatic control system of hydro unit, hydro turbine model, hydro turbine.*