The macromodel of a six-phase synchronous machine with combined excitation for electric power systems processes study.

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A mathematical model of a six-phase synchronous machine in a phase coordinate system with a combined excitation system containing conventional electromagnetic excitation and permanent magnets is proposed. The synchronous machine macromodel forms equivalent circuits of power electrical and mechanical subsystems, providing the possibility of connecting the necessary additional equipment to the external terminals of the macromodel. A simulation of the transient process caused by a short circuit at the terminals of the motor field winding occurring in the nominal mode is performed. The analysis of the obtained oscillograms confirms the operability of the proposed macromodel.

Key words: mathematical model, macromodel, simulation model, six-phase synchronous machine with combined excitation, phase coordinate system.