Influence of parameters of large turbogenerators on short circuit currents and torques.

Brilinsky A. S., Grishin N. V., Koshcheev L. A., Smolovik S. V.

Powerful turbogenerators (T3V-1200-2A, TVV-1200-2) are characterized by significant design complexity and large electromagnetic and mechanical loads. To reduce the rated currents and short-circuit currents, the stator winding is made of a six-phase split into two three-phase systems with a shift of 30 degrees, while they form phase-matching first harmonics of magnetic field induction in the air gap of the machine. The presence of mutual inductance of three-phase systems by stator leakage magnetic flux and mutual magnetic flux determines the specifics of transient processes during emergency disturbances. Earlier studies revealed large currents values during short circuits at the terminals of the windings. The purpose of the article is to determine the influence of the main parameters of generators on short-circuit currents, including mutual inductance between split three-phase stator windings.

Key words: synchronous generator, split stator winding, three-phase short circuit, non-simultaneous short circuit.