

Theoretical and Experimental Analysis of the Short Circuit Current Components in Salient Pole Synchronous Generators

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1. Summary

This paper presents a theoretical and experimental analysis of the short circuit current produced by a salient pole synchronous generator using the experimental data and parameters from a micro machine laboratory simulator.

Basics of synchronous machine short circuit currents and differences between the current components of salient pole and round rotor machines (and between micro machines and conventional low capacity synchronous machines) are explained by means of an IEEE standard procedure which is also useful to determine the dynamic parameters of the synchronous generators. This task is performed by a MATLAB® computer program developed in an undergraduate thesis work, which extracts the components from measured data and computes the dynamic parameters from the conventional short circuit test.

This experiment is intended to show last year undergraduate, as well as graduate electrical engineers these concepts, which are very important to understand synchronous machine transient behaviour and power system simulation of short circuits.

Key words: Synchronous generator short circuit, salient pole machines, micro machine laboratory.