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Methods for condition monitoring and fault diagnosis on a synchronous 2 pole generator

Doorsamy, Wesley

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Abstract

In order to increase the integrity of existing generation systems, it is essential to discover problems well in advance. An investigation into methods for diagnosing multiple incipient faults on a 2-pole synchronous generator is presented. Simulation of the generator on a finite element analysis (FEA) software package is used to predict the effects of these faults. Experimental analysis of the generator under fault conditions is then conducted and confirms the predicted behaviour. The investigation utilises search coils and shaft brushes as condition monitoring tools. Results of the investigation indicate definitive relationships between the faults and specific harmonics of the output signals from the condition monitoring tools. The presented techniques are viable and future work can utilise these results in the design of a fault diagnosis system.