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**On-line condition  
monitoring and fault  
detection in hydropower  
generators**

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## Background

The hydropower generator is a vital component in hydropower powerplants, and it's critical failures are associated with high repair and outage costs. Therefore hydropower producers utilize preventive maintenance on the generators to avoid failures. The advancement of technology creates new opportunities to improve the maintenance of the generators by the use of On-Line monitoring systems, increasing reliability of the generator in a cost-effective manner.

This thesis will study eccentricity faults. Eccentricity is the condition when the center of

the rotor and center of stator is not the same. This results in an asymmetrical airgap, which leads to the occurrence of an unbalanced magnetic pull (UMP). Excess UMP will lead to mechanical degradation of the generator.

The objective of the master thesis is to develop a monitoring technique for eccentricity faults, which will be able to distinguish between the types of eccentricity, and other UMP conditions. The fault conditions are to be simulated with the FEM software Ansys Maxwell, and then analyzed.

