

PhD Thesis

Investigation of Low Frequency Currents in the Electrical Power Transmission Network and their Effects on Power Transformers

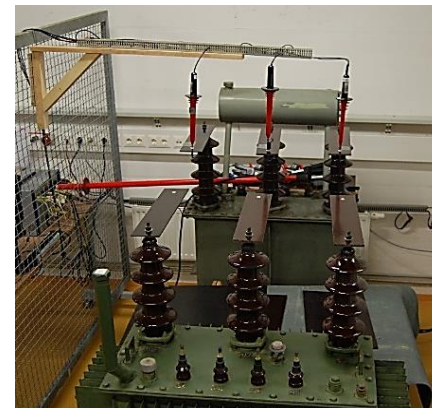
Low frequency current (LFC) in the range of 0-1 Hz can affect the high voltage transmission network stability negatively. They are caused by high geomagnetic field variations (due to high sun activity) or are driven by electrical systems like public DC transportation systems.

One major challenge during superimposed LFC is the saturation of power transformers. The saturation causes an increase in reactive power demand and increasing losses in the transformer.

In the scope of this dissertation the following aspects will be investigated:

- Power demand of transformers under symmetrical and asymmetrical LFC
- Effects of the saturated transformer on the transmission network
- Effects of LFC on the transformer asset management

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Transformer Laboratory Tests