

A quiet retrofit



Subject:

Retrofitting Current Transducers (CT) in a noisy 400 kV power transformer of a wind farm grid connection to measure the DC current in 400 kV phases and neutral.

The main challenge:

Significant audible noise - more than normal - is emanating from a wind power connection power transformer. This is impacting the life time of the transformer and can cause degradation and aging of the isolation system.

One possibility is that this might be caused by DC current pollution in the high voltage grid.

However, the customer had no ability to measure the DC current in the HV grid, so it was not possible to determine an appropriate solution.



Proposed solution:

Senseleq is working together with the customer on a program to measure the DC component of the 400 kV transformer phase and neutral point to be able to quantify the issue.

Ring core CTs will be installed around (slipped over) the HV and neutral bushings on top of the transformer tank. When the levels of pollution can be measured accurately, the customer can develop a filtering solution at the source of the pollution.

This will prevent damage to the 400 kV power transformer and other HV equipment.

Senseleq has proposed this approach alongside the transformer manufacturer to guarantee that the transformer remains in operation.

The proposed solution includes a hybrid CT unit positioned where the existing metering and protection cores are currently installed in the existing ring core CT around the transformer bushing. This means Senseleq will deliver its new sensor alongside the existing inductive ring cores built into a cast resin unit the same size as the one it will replace.

The analog output current of the new sensor will be used to measure the DC current. The output current signal will include the entire spectrum of components: AC 50 Hz; DC, harmonics up to 50 k Hz, etc. Each will be measured to high accuracy levels; the customer will handle the filtering and A/D conversion internally.