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Current Transformer (CT) Testing Admittance vs. Burden + Ratio

Admittance Testing

Admittance testing injects an audio signal with a frequency of about 1.5 kHz into the secondary of the CT under test and monitors the response. If the response of a CT changes over time, the test demonstrates that there has been some change in the CT or its wiring.

If a group of CTs of the same type are being tested, any CT with a significantly different response suggests a problem with that CT. If a benchmark response is determined for a particular CT upon initial installation, then future changes can be detected.

Burden + Ratio Testing

Burden + Ratio testing involves adding a known resistance (in Ohms) to the secondary current while simultaneously measuring both the primary and secondary current of the CT at each incremental burden step. Since this is a direct measurement, the initial ratio at zero burden can be checked directly against the nameplate value of the CT.

Burden problems can be detected even at low current levels by observing a ratio change when applying incremental burden steps to simulate the total burden (VA) at the CT current rating. Also, the percentage change in ratio removes problems associated with customer load variation that may occur in burden testing alone since the ratio is calculated from the secondary current relative to the primary current.

Admittance vs. Burden + Ratio Testing

The difficulty with Admittance testing is attempting to determine the benchmark response of a CT under test. Few utilities can maintain a history of admittance results on every CT. Without such a history, the test must be based on a typical CT of the same type and will only reliably detect large changes. Furthermore, if an inherent error exists at the metering service for a new installation, Admittance testing will not identify the error until a future test detects a CT response change. Also, the typical accuracy for a signal response with Admittance testing is only $\pm 5\%$ of reading.

With Burden + Ratio testing, a direct correlation can be made to phase relationships for each CT to help expose specific issues with wiring errors, whereas Admittance testing cannot correctly report these type of measurements. Also, measurements can be made with very high accuracy up to 0.05% of reading depending on the type of current probe used.