

# Infrared thermography detects potential cooling system problem

During a routine transformer inspection, SDMyers performs infrared (IR) scanning, an effective complementary analytical method, to help a Michigan-based utility company avoid downtime.

## CHALLENGE

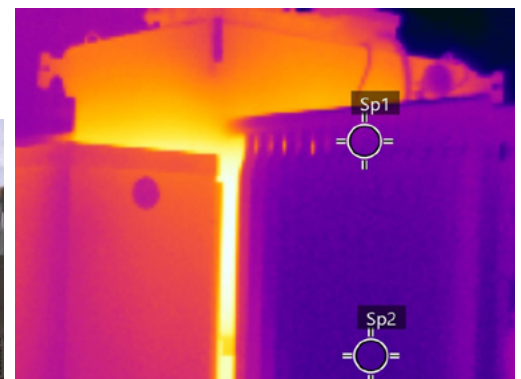
Committed to reliability-centered maintenance, an SDMyers utility customer in Michigan had almost 30 years of annual transformer inspections and sampling under its belt. However, while liquid testing is proven to be a proactive and clear-cut way to evaluate a transformer's condition, it cannot see all failure modes. The customer desired a more extensive transformer assessment.

## SOLUTION

SDMyers recommended IR thermography inspection, which could be performed at the same time as the routine liquid sampling. Aside from being efficient, this allowed our diagnostic team to interpret the IR scanning data with the routine liquid test data to create a comprehensive asset snapshot. The additional data points enabled a more accurate assessment of the transformer's condition.

During the IR inspection, the thermographer identified a problem in one of the radiator banks, the unit's main cooling system. Instead of showing a smooth, decreasing temperature gradient from top to bottom, indicating proper operation, the thermal image indicated that the entire radiator bank was cool.

This is usually an indicator of a low liquid level and is something that cannot be seen from liquid sampling. Although this type of deficiency is normally identified during the visual inspection of the level and temperature gauges, the situation was complicated by the fact that both gauges were showing irregular fluctuations year to year and season to season. This led to the conclusion that one of the gauges was faulty and would need to be replaced.



TRANSFORMER RADIATOR — A COMPARISON OF CONVENTIONAL PHOTOGRAPHY AND A THERMAL IMAGE SHOWING THE LACK OF A TEMPERATURE GRADIENT WITH ONLY A DELTA OF 0.6°C BETWEEN SP1 (22.4°C) AND SP2 (21.8°C).

## OUTCOME

By utilizing IR thermography, this customer was able to confirm that the liquid level was low (even with a possible gauge problem) and the radiator was not cooling the liquid as it should. In addition to collecting the data needed to justify a liquid top-off service and gauge replacement, the customer was able to prevent:

- Overheating of the oil (which causes thermal degradation of the paper)
- Loss of life of the paper insulation (directly affects overall transformer life)
- Exposed core and windings (could cause flashover and lead to catastrophic failure and unplanned downtime)