

Infrared thermography detects potential transformer deficiency in main tank

Using infrared (IR) scanning, an effective complementary analytical method, SDMyers uncovers a potential failure mode not identified by dissolved gas analysis (DGA) for an industrial customer.

CHALLENGE

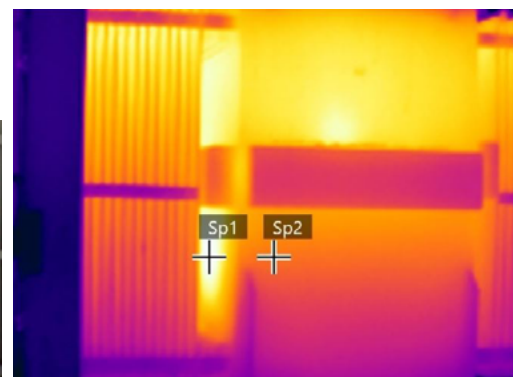
An SDMyers industrial customer located in Pennsylvania prioritized routine liquid sampling and analysis for its 7,500 kVA transformer. While liquid sample analysis is the primary indicator of transformer condition, it does not paint the whole picture of asset health in all situations. Having identified this transformer as a critical asset, the customer sought an additional preventive maintenance inspection method.

SOLUTION

SDMyers recommended IR scanning as a way to supplement liquid test results with additional data for analysis and diagnostics. Performed at the same time as the routine liquid sampling, IR scanning is a convenient way to add value when analyzing liquid samples.

The initial infrared scan on the customer's transformer detected a potential deficiency. Although it did not merit immediate action, the IR report showed a hot spot on the horizontal plane on the main tank. During the next regular liquid sampling and inspection, the thermal images showed a progression with multiple distinct hot spots on the tank. Normally a temperature difference of 1 to 3°C is acceptable on the horizontal plane but this transformer exhibited differences from 5 to 16°C.

By cross-referencing the IR scans with the DGA results, SDMyers was able to look for elevated levels of ethylene, among other dissolved gases, to confirm an internal issue. However, in this specific case, the DGA results did not show significantly higher levels compared to past tests. This is an important example of how DGA alone may not indicate an internal problem.



MAIN TRANSFORMER TANK — A COMPARISON OF CONVENTIONAL PHOTOGRAPHY AND A THERMAL IMAGE SHOWING HOT SPOTS WITH A DELTA OF 16.2°C BETWEEN SP1 (41.2°C) AND SP2 (25°C).

OUTCOME

Since the DGA results did not show elevated levels, SDMyers determined that the hot spots could be indicating an internal issue and recommended continued monitoring through liquid analysis and thermography. The IR scans, in conjunction with the lab analysis, were able to equip the customer with the data required to:

- Justify the investigation needed to make strategic, long-term asset decisions
- Prevent overheating of the liquid (which causes thermal degradation of the paper)
- Potentially avoid the costly downtime of a critical asset's failure