

Thermal Exception Case Study

Saves Client \$165,000

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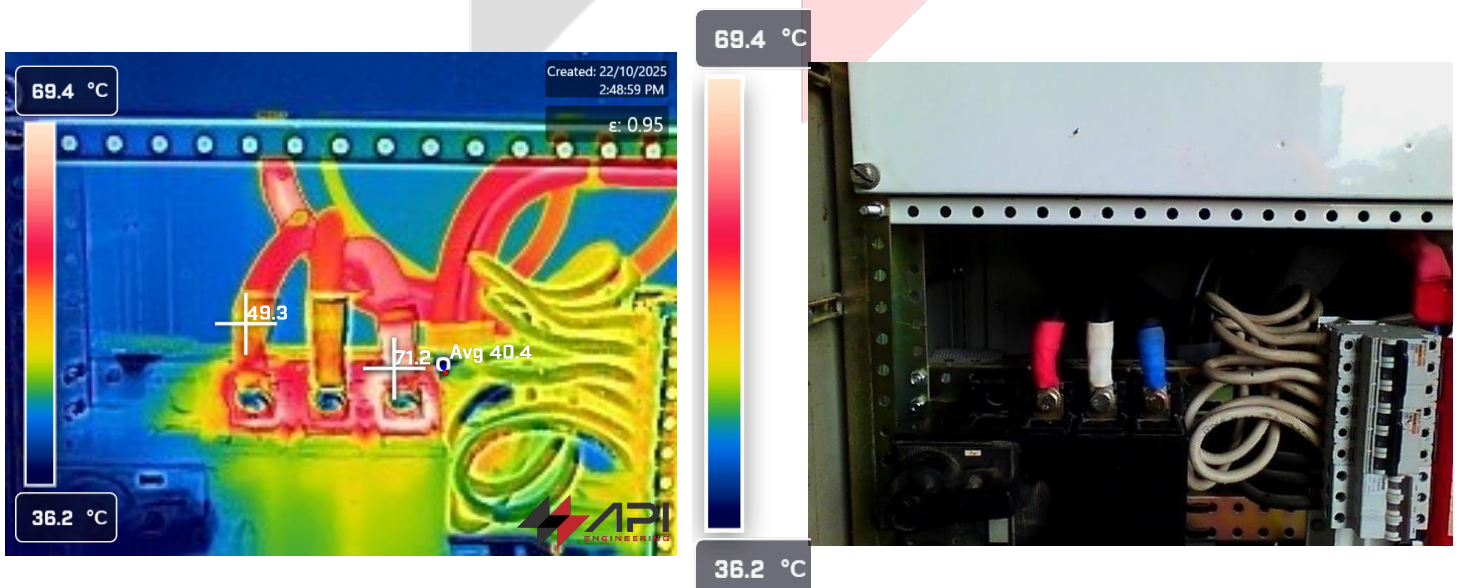
Summary:

During a routine annual qualitative thermal inspection required by our client's insurance company, an exception was discovered on an isolator in our client's MDB.

The cables in this installation were rated to a maximum of 250A and were running through a 250A isolation switch. The Delta T's between phases were averaging a differential of 20°C from A-C Phase or B-C Phase. C Phase was recorded at 71.2°C with an ambient air temperature of 38°C.

A, B, and C Phases were tong tested and recorded at a near balanced load of 170A with only 1-3 amps of differential, a power factor of 0.97, and minimal harmonic disturbances on site.

Using the Infrasppection Institute *Standard for Infrared Inspection of Electrical Systems and Rotating Equipment*, Tmax calculations were conducted as well as Tmax for actual current flow. Both calculations determined that the cables should be operating no higher than 54.2°C with the isolator and point of connection having a maximum operating temp of 51.9°C.



Conclusion:

These results implied the fault was most likely a loose connection on C Phase. After coordinating with the customer, the site was shut down to allow further inspections.

Once the isolator had been de-energized, it was discovered that the exception wasn't being caused by a loose connection via the cable bolt or lug. Instead, the internals of the isolator had come loose over time and had movement causing a hot spot which increased the cable temperature near the point of termination. With power being a critical requirement to the livestock on this site, repair plans were put into place immediately with a new isolator being installed.

Profit and Loss:

This customer's site houses livestock in ventilated sheds. If the site were to shut down due to isolator failure, the minimum restorative costs were estimated to be well over \$175,000.

The thermal imaging, reporting, inspecting, and repair work came to less than \$10,000. By preventing a major breakdown, the customer saved a minimum of \$165,000. This savings was in addition to the considerable fines that could have been imposed had an unplanned breakdown occurred.

