

Automated vs. Manual Thermal Monitoring Return on Investment

Automated vs. Manual Thermal Monitoring

Utilities have long used manual monitoring done by a skilled thermographer to detect hotspots in their electrical system. While this method has provided results, there are advantages to a continuous flow of information vs. taking snapshots of the system.

A snapshot of thermal information requires the operator to be in the right place at the right time. Lighting and load conditions, temperature and humidity affect the readings as does the distance from the object.

- Is the snapshot taken from the same place each time?
- What is the weather and system load when the snapshot is taken?
- Is the thermographer interpreting the data the same way each time?

Continuous thermal monitoring provides a consistent flow of information that can be correlated to weather conditions and system load to provide a more accurate view of the system that can be used for trend analysis and input to a condition based maintenance program. The thermal camera continuously cycles through pre-programmed stops to take temperature measurements from multiple points of interest. Thermal data can be provided to operators in real time in the following ways:

- Thermal analytics are programmed to determine if monitored points go out of range. Operators are immediately notified via SCADA alarm or email so action can be taken
- Inputs to a SCADA system – points can be tracked in the SCADA system as analogue points so they can be monitored in real time
- Measurement points are stored in a database so they can be further analyzed in a trend analysis tool for condition based maintenance
- Real-time thermal video can be viewed remotely

Return on Investment Analysis:

Manual Thermal Inspection Cost			
	Cost per day	No. of days	Annual Cost
Onsite Thermographer / day	2000	4	8000
Utility cost to escort	1000	4	4000
Thermography report	1000	4	4000
Annual Cost (4 Inspections)			16000
Thermal Asset Monitoring System Cost			
	Cost	Qty	Total
Asset Monitoring System Cost	50000	1	50,000
Installation	2000	1	2,000
Total			52,000
ROI (Years)	3.3		

Variable
Calculated

Assumptions:

- Costs and frequency of manual inspections is estimated
- Estimated one day required to inspect the substation
- Automated thermal asset monitoring system can monitor four transformer bays

Based on the calculation the return on investment is realized in approximately three years.

Additional Automated Thermal Monitoring Advantages:

- The monitoring system pays for itself after the ROI period
- Data is more accurate and is collected in real time
- Reduced trips to inspect remote substations
- Real time thermal substation visualization
- Input to a condition based maintenance program

Summary

Advances in thermal monitoring have given utilities access to technology to automate inspections in remote substations. The technology provides non-invasive, continuous, remote monitoring of operating temperatures in high value assets allowing utilities to detect problems before failures occur and reduce unplanned outages. Automated inspections are safer and increase reliability, reduce outages and provide economic benefits to customers and stakeholders.

For more information about Utility Grade Video Automation Solutions for Substations please contact: Sales@SystemsWithIntelligence.com