Continuous Thermal monitoring improves the reliability of power delivery systems while reducing maintenance costs

Electric power companies need systems that reduce the risk of breakdown in power delivery, such as blackouts and brownouts, often caused by aging infrastructure. A breakdown can have extensive negative affects to the customers and communities they serve. The costs associated with unplanned maintenance and restoring systems operation again can be massive.

Typical substation components monitored by electric power utilities include:

- Power transformers
- Insulator bushings
- Lightning arrestors
- Mechanical disconnects
- Batteries
- Load tap changers
- Standoff insulators
- Circuit breakers
- Control cabinets

**System Solution**

Thermal imaging camera systems are the ideal solution, providing constant automated monitoring so that problems are identified before failure occurs. Traditional monitoring of substation equipment utilizes handheld thermal imaging cameras. One can easily see how this type of monitoring and inspection has the potential to miss warning signs of impending failure. In order to improve reliability and reduce risk, Viper installs FLIR thermal imaging camera systems integrated with powerful ViperVision software for continuous monitoring. Temperature anomalies in system components are monitored by the system which can alarm, providing early warnings in real time. This allows for better maintenance planning and reduces the risk of catastrophic failure.

FLIR cameras are integrated with ViperVision software to directly communicate with most industrial platform controllers (OPC, Modbus, Ethernet/IP, etc.). Temperature data is displayed on a monitor in real time, and hot spots are often evident before excessive heat or insulation loss results in failure. The software analyzes and compares the data against predefined parameters and will trigger an alarm if warranted. These parameters can be adjusted based on the specific application needs, and all data can be saved for process analysis and quality control.
**Typical Installation**

Viper provides customized system solutions based on the specific substation needs. FLIR A65 thermal imaging cameras are installed to verify temperatures and locations. The FLIR A65 is mounted in the ViperVenom enclosure which is an extremely rugged system that meets IP66 requirements, protecting the camera from the environment. Viper’s systems are customized to view as much of the process as necessary while using as few cameras as possible. In fact, one camera can monitor several critical assets simultaneously.

The camera’s digital data stream is connected via Ethernet, fiber optic cable or wirelessly to the ViperVision control system. ViperVision software controls all camera functions, collects temperature data, displays thermal images and analyzes data.

**Key Benefits**

- Instant notification alarm for temperature beyond preset parameters
- Improved reliability of electric power delivery
- Reduced maintenance costs and enhanced personnel safety
- Provides quantitative temperature readout and remote visual monitoring for plant management
- Reliable and rugged system
- Easy integration into existing plant control system
- Some customers report an insurance premium discount because of the increased reliability

*Camera mounting options include fixed and gear-driven pan/tilt.*