

# Fiber Optic Thermal Monitoring

## DATA CENTERS AND UPTIME

System uptime is absolutely critical to business success. When a power outage occurs, it not only affects business operations, but can cause devastating financial and reputational losses, negatively impacting market standing. On average, unplanned data center outages cost nearly \$9,000 per minute.<sup>1</sup> For these reasons, effective monitoring of switchgear and associated live electrical equipment is crucial.

### The Current Technology

IR (infrared) inspection windows are the most common method for inspecting and monitoring live electrical equipment. An IR window is a viewport installed in a switchgear cabinet that allows for periodic inspection using a thermal camera. Inspections are typically only performed once or twice a year, by certified personnel. Although this method is better than doing nothing, it has some key limitations.

### The Limitations of Legacy Monitoring

1. With periodic IR monitoring, inspections are only performed when scheduled. When budgets are tight or workloads too high, these inspections may be delayed or neglected, allowing unwanted deterioration and defects to grow undetected.
2. Obstacles like insulation boots and equipment panels often prevent direct line-of-site measurement, resulting in actual hot spots being missed and under-estimating critical insulation temperatures.
3. Scheduled inspections most likely do not coincide with the peak load conditions when critical temperatures are reached.
4. When failures do inevitably occur, IR monitoring leaves a weak audit trail for root cause analysis and may make insurance claims more difficult to support.

### Advantages of Continuous Thermal Monitoring

1. Fiber optic temperature sensing systems can detect and prevent up to 70% more failures than periodic IR inspections alone.
2. Trending of thermal activity is constantly recorded, providing important parameters for predictive diagnostics and system analytics.
3. All data is accessible through OSENSA's cloud platform or can be fed into any secured third-party monitoring application.
4. Continuous thermal monitoring eliminates the labor costs associated with periodic inspections, saving money in the long run.
5. Fiber optic temperature sensors are inherently safe, easy to install, and designed to reliably report temperature for the life of the equipment without need for re-calibration.

### Did You Know?

An arc flash is the greatest threat to personnel working around live electrical equipment, causing an estimated 2,000 severe burn incidents each year and one to two deaths per day.<sup>2</sup> In the event an arc flash occurs, a study must be performed to determine the root cause and eliminate the problem. OSENSA's fiber optic thermal monitoring solutions record all the necessary data to streamline the investigation process.

### What's the Cost?

With OSENSA's thermal monitoring solution, the return on investment is generally only 2 to 3 years, and the risk of equipment failure is virtually eliminated. OSENSA's fiber optic sensors are budget friendly, incur no future inspection costs, and provide continuous thermal monitoring with simple integration into your existing SCADA solution. The risk of failure and the associated cost of not continuously monitoring critical electrical equipment for outweighs the one-time investment.

1. Ponemon Institute (2016). 2016 Cost of Data Center Outages. Vertiv.  
 2. Hall, R. (2020, January). Preventing and Minimizing Arc Flash Risk. Machine Design, 92(1), 00249114.

