



Smart Inspection and Diagnostic Solutions

Empowering Electrical Asset Reliability in Data Centers

OVERVIEW

Founded in 1993, OFIL Systems has been a leading provider of solar-blind UV (DayCor®) inspection systems in the high-voltage markets. We stand at the forefront of tackling the growing challenges in electricity. Our pioneering innovation, solar-blind UV technology, introduced a new era of predictive maintenance, enabling precise and real-time detection of corona partial discharges and arcing in full daylight.

OFIL Systems' cutting-edge Gridnostic platform elevates the inspection capabilities by enhancing grid reliability through image intelligence. Gridnostic is designed to revolutionize how electrical utilities manage and maintain their electrical assets, ensuring reliability, efficiency and safety.

Handheld Cameras

- DayCor® UVollé
- DayCor® Luminar HD

Applications:

Inspection of transmission & distribution lines, substations, transformers, rotating machines, EV motors, HV components and more.



UAV (Drone) Cameras

- DayCor® micROM HD

Applications:

UAV inspections for transmission & distribution lines, substations and railway overhead lines.



OEM & Core Cameras

- DayCor® UV Eye
- DayCor® UV Eyelite
- DayCor® UV EyeScope

Applications:

Vehicle mounted systems, robot-mounted, train-mounted, continuous monitoring of substations, fixed and PTZ installations, integration in OEM systems and more.



OUR DIAGNOSTICS SOLUTION

Gridn^ostic

Grid Reliability through Image Intelligence

Gridn^ostic is a software platform that leverages multi-sensor technologies including UV, RGB and thermal, converts complex imagery data into clear numeric severity scores and delivers actionable insights for efficient asset health management.

EPRI This product was developed based on research and guidelines from the Electric Power Research Institute (EPRI) and integrates all inspection data within a geospatial context, offering a strategic, map-based overview of grid performance.

- 🔄 **Multi-sensor Integration:** Leverage multi-sensor technology including UV, RGB and Thermal to enhance analysis capabilities.
- 🔄 **GIS-enhanced Platform:** Integrates all inspection data within a geospatial context, offering a strategic, map-based overview of grid health.
- 🔄 **Simplifying Complexity – AI Enabled:** Transform complex data into clear, actionable insights with AI models enhancing data interpretation.
- 🔄 **Asset-based Data Management & Reporting:** Efficiently manage historical data and enhance communication with sharing and reporting capabilities
- 🔄 **Expert Advice & Diagnostics:** Backed by years of industry knowledge, receive expert advice and diagnostics to solve problems faster.



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Case Study

How a Leading Global Cloud Provider Uses UV Inspections and Gridnostic Analytics to Protect Its Data-Center Substations

Overview

A major global cloud and AI infrastructure provider operates dozens of hyperscale data centers across North America, Europe, and Asia. These facilities host mission-critical digital services including cloud computing, enterprise applications, finance, e-commerce, and rapidly expanding AI workloads.

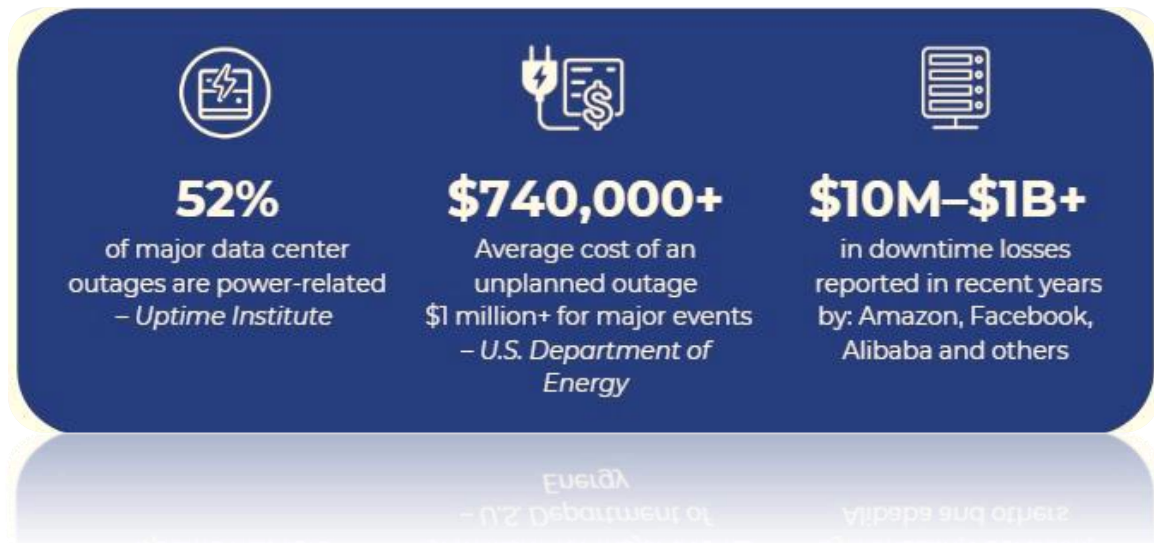
As electrical demand at these campuses surged, driven by GPU clusters and high-density compute racks, the company needed a more predictive and reliable way to monitor the high-voltage (HV) and medium-voltage (MV) systems powering its facilities. Ensuring continuous uptime became a strategic priority.

To address this challenge, the operator implemented a predictive maintenance program centered around OFIL solar-blind UV corona cameras and the Gridnostic inspection platform, enabling early detection of partial discharge (PD), arcing, insulation deterioration and other faults, across its substations, transformers, switchgear, cables, and generators.



Background: Rising Energy Demand in the AI Era

Modern data centers consume up to 50x more electricity per square foot than traditional buildings. In 2023, U.S. data centers represented 4.4% of national electricity consumption, with projections reaching 6.7–12% by 2028.



This global cloud provider faced:

- Continuous expansion of AI-intensive compute clusters
- Higher loading on transformers and MV gear
- Increased sensitivity to even minor electrical faults
- Long lead times for HV transformers (18–24 months)
- A zero-downtime operational philosophy

As power density increased, even small PD events became risks that could trigger outages, equipment degradation, or catastrophic failures.

The Challenge

The global cloud operator identified several critical vulnerabilities in its electrical infrastructure:

1. Hidden early-stage degradation

Visual inspection and thermal imaging alone could not detect early PD in substation components because it doesn't generate heat or visible signs until much later stages.

2. Reliability of HV/MV transformers amid global supply shortages

With long procurement times and a worldwide shortage of large power transformers, ensuring the reliable operation of existing units has become a top priority. Any unexpected issue in a step-down transformer feeding a data-center substation can lead to extended downtime.

3. MV switchgear reliability and vulnerable components

Medium-voltage switchgear contains several elements—such as cable terminations, busbars, and breaker insulation—that can gradually develop issues over time due to environmental conditions, aging, or installation-related factors.

4. High-impact environment

A single substation failure could disrupt cloud services across regions and impact millions of end-users. The company needed a diagnostic technology capable of detecting problems *before* they reached a thermal or visible stage.



Solution: Handheld UV Inspections, Continuous UV Monitoring Systems and Gridnostic Analytics

1. Handheld UV Corona Cameras for Routine and Targeted Inspections

Technicians use OFIL's handheld solar-blind UV cameras to inspect high-voltage and medium-voltage assets across substations without interrupting operations. The devices enable quick, accurate detection of partial discharge (PD) and arcing on components such as:

- HV and MV transformer bushings
- MV switchgear compartments
- Cable terminations and splices
- Outdoor and indoor busbars
- Generator windings and hardware



Handheld inspections are performed from a safe distance and normal grid operation, allowing teams to identify anomalies that are invisible to the naked eye and cannot be detected thermally or visually at early stages.



2. Continuous UV Monitoring Cameras for Real-Time Condition Awareness

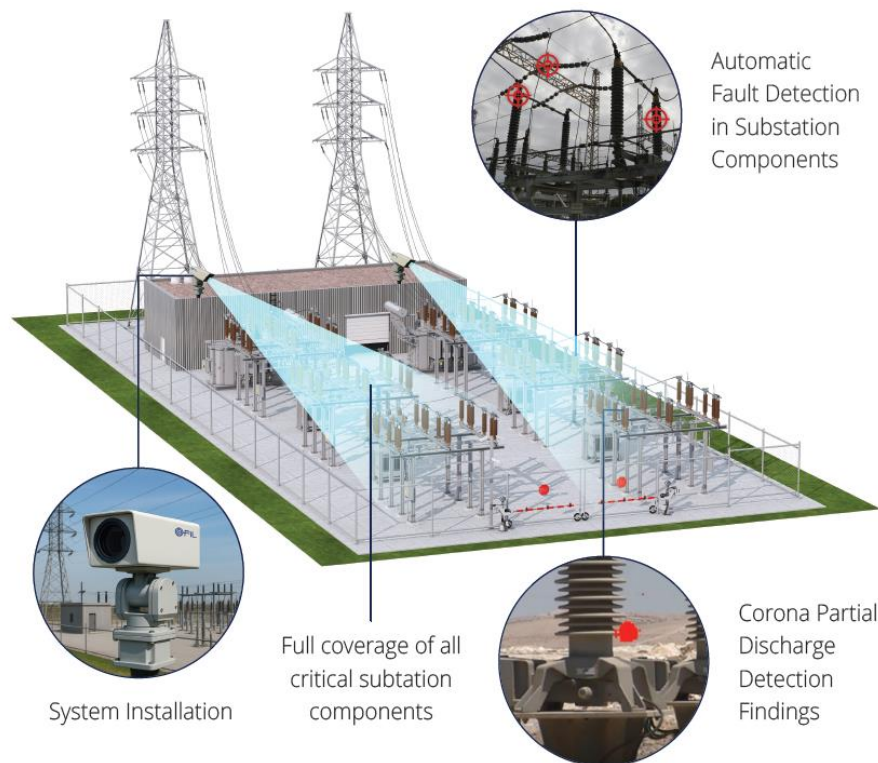
For substations powering high-availability zones and GPU-dense compute clusters, the operator added fixed UV monitoring units to ensure 24/7 visibility of the most critical components.

These monitoring units were installed to observe:

- Substation components
- Transformer bushings
- Switchgear busbars
- Cable terminations and outdoor connections

Continuous monitoring provides:

- Instant alerts when abnormal discharge appears
- Automatic recording of events for root-cause analysis
- Early detection of faults between scheduled inspections
- Long-term trending of PD behavior over time
- Monitoring during weather events, humidity changes, or contamination buildup



3. Unified Analysis and Severity Assessment with Gridnostic

After each handheld inspection or monitoring alert, technicians upload UV images and videos into the Gridnostic platform, which provides a centralized analysis environment for all sites.

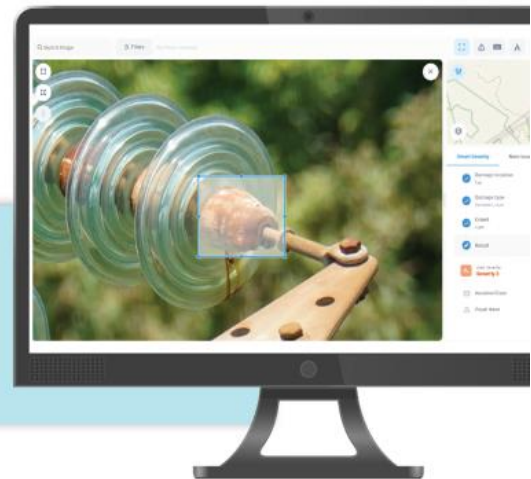
Gridnostic enables:

- EPRI-based severity scoring for objective fault assessment
- AI driven analytical capabilities
- Historical comparisons across multiple inspection cycles
- Multi-sensor diagnostics (UV + thermal + visual)
- Maintenance prioritization based on actual condition trends
- Reporting and documentation for internal and external stakeholders

By combining handheld diagnostics, continuous monitoring, and Gridnostic analytics, the operator created a complete and repeatable methodology for maintaining substation reliability across a fast-growing data-center portfolio.

EPRI

This product was developed based
on research and guidelines from the
Electric Power Research Institute (EPRI)



Results

Within the first year of deployment, the cloud provider achieved:

✓ **Early identification of critical transformer bushing PD**

A moderate-severity discharge was found during a routine scan, allowing a planned replacement before failure.

✓ **Detection of hidden PD inside MV switchgear**

UV inspection revealed partial discharge with no thermal or visible indicators, allowing teams to address an emerging insulation issue before it escalated.

✓ **Standardized inspection workflows across regions**

Gridnostic enabled consistent scoring and maintenance planning across multiple data-center campuses.

✓ **Significant reduction in unplanned downtime risk**

The system helped prevent issues that could have caused outages costing millions.

Why UV Inspection & Gridnostic Became Strategic Tools

The operator now treats UV detection as a core pillar of its electrical reliability program because it:

- Detects faults much earlier than visual and thermal imaging
- Works from a safe distance, without equipment shut down
- Extends transformer and switchgear life
- Supports proactive asset management
- Reduces catastrophic failure risk

In an environment where uptime is mission-critical, UV inspection and Gridnostic analytics give operators a unique view into electrical health long before traditional tools detect abnormalities.

