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OFIL SYSTEMS

NEWSLETTER

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OFIL Systems is proud to collaborate with **NETA** and participate in this year's conference, bringing advanced UV inspection technology to the forefront of electrical safety.

- Expert Session – Dual Technology (UV + IR) - Join Dave Ryan's technical presentation and learn why IR alone leaves critical gaps and how combining UV and IR provides a complete, proactive view of asset health.
- Safety Immersion Experience - Step into a hands-on electrical safety zone, test your knowledge, and see how detecting invisible hazards enhances real-world protection.

Connect with our experts at Booth 628

2026 NRECA PowerXchange &TechAdvantage

TechAdvantage 2026

Mar 08, 2026 - Mar 11, 2026

Nashville, TN, United States

Stop by the OFIL Booth 755 to see how Gridnostic gives utilities real-time visibility and predictive intelligence across the grid.
It's time to move from reactive to proactive grid maintenance.
If you're focused on improving reliability, reducing outages, lowering maintenance costs, or modernizing your grid - Gridnostic is a game-changer.

Transforming UAV Inspection Data into Action: How City of Troy Streamlined Asset Management with Gridnostic

Background

The City of Troy is a municipal electric utility serving a population of approximately 8,000 residents. The utility is responsible for maintaining more than 5,000 distribution assets, including poles, transformers, and associated equipment, as well as multiple substations across its service territory.

Over the past several years, the City of Troy has developed a highly structured and forward-leaning drone inspection program. Using advanced RGB and thermal sensors, the utility conducts annual inspections of its distribution network, capturing large volumes of visual and thermal imagery to identify developing faults, deterioration, and safety risks.

The Challenge

While the inspection program itself was mature, the way inspection data was handled had become a limiting factor. Images and videos collected during drone flights were stored across multiple shared drives and folders, making it difficult to:

- Associate imagery with the correct physical assets
- Review inspection findings consistently across the team
- Compare results year over year
- Quickly extract insights to support maintenance decisions or reporting

As inspection volumes increased, the lack of a centralized inspection data platform began to slow down post-processing, analysis, and decision-making.

The Turning Point

In 2025, Chase Collins, UAS Program Director for the City of Troy, initiated the move to Gridnostic as a centralized platform for managing and analyzing inspection data.

"We had a solid inspection program, but our data lived in too many places. We needed a single system that could organize everything and make the data usable," Chase explains.

The Gridnostic Approach

Using Gridnostic, the City of Troy now uploads all RGB and thermal inspection imagery into a single cloud-based platform. Each image is automatically connected to its corresponding asset and displayed on a GIS-based map, providing immediate spatial and asset-level context.

Instead of performing time-consuming reviews in the field, Chase's five-person inspection team focuses on fast, efficient data collection during flights. Detailed inspection and analysis are then carried out in the office.

"We no longer spend 10–15 minutes per pole reviewing imagery in the field. We capture the data quickly and do the real inspection work afterward in the office, where it's far more efficient," says Chase.

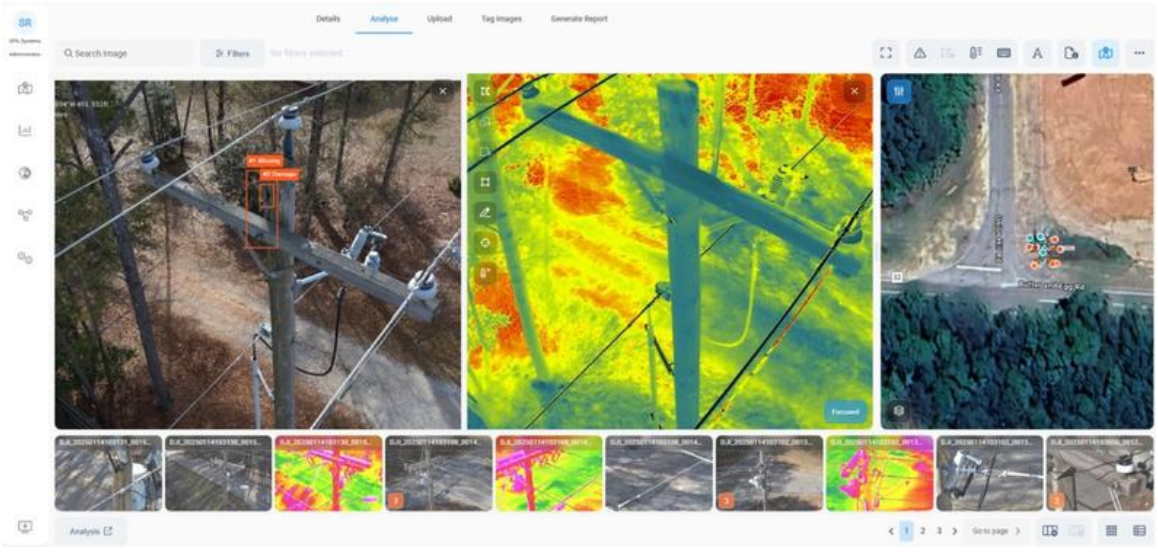
Standardized Analysis and Severity Prioritization

Gridnostic provides structured inspection workflows aligned with EPRI-based guidelines and industry best practices. This allows the City of Troy to evaluate findings consistently and assign severity levels across the network.

This structured approach helps ensure that resources are directed where they are needed most, while still maintaining long-term asset health.

Multi-Sensor Analysis Screen

Side-by-side RGB and thermal inspection imagery within a structured evaluation interface. Supports consistent severity assessment and precise component-level analysis.



Network-Level Visibility
Beyond individual assets, Gridnostic dashboards give the utility a network-wide view of inspection results. Chase and his team use these dashboards to identify patterns and geographic clusters of issues.

*"**In some cases, we saw multiple issues concentrated in the same area. That kind of visibility really opened our eyes and helped us understand where systemic problems might exist,"** Chase notes.*

GIS Asset View
Interactive map displaying assets by ID, with color-coded markers reflecting calculated severity levels. Enables rapid geographic risk prioritization and direct access to inspection images.

Documentation and Compliance Value

In one notable case, the City of Troy was able to support a **FEMA reimbursement claim** using inspection imagery. Historical images showed that a specific fault was not present during the annual inspection and was instead caused later by a weather-related event. This documentation played a key role in demonstrating the timeline and origin of the damage.

EPRI-Based Report Output

Automatically generated asset report including EPRI-aligned severity classification and maintenance recommendations. Converts inspection findings into standardized, decision-ready documentation.

Results

By adopting Gridnostic, the City of Troy achieved measurable operational and financial improvements without changing its existing inspection methodology:

Increased inspection efficiency: Field crews now focus exclusively on data capture, reducing time spent per asset and enabling more inspections per flight day without additional staffing or equipment.

Lower operational costs: Centralized data management eliminated time lost searching across shared drives and folders, reducing post-inspection processing and administrative overhead.

Improved maintenance cost allocation: Standardized, EPRI-aligned severity assessment allows the utility to prioritize Severity 4 and 5 issues while scheduling lower-severity findings into planned maintenance—reducing unnecessary truck rolls and premature repairs.

Better budget control and visibility: Network-level dashboards provide a clear view of asset condition across the grid, supporting data-driven maintenance planning and more predictable annual budgeting.

Stronger documentation for cost recovery: Historical inspection imagery stored in Gridnostic enabled the City of Troy to demonstrate that certain faults were weather-related and not pre-existing, supporting successful FEMA reimbursement claims and offsetting unplanned repair costs.

For the City of Troy, Gridnostic has become a core component of turning inspection data into actionable, defensible maintenance decisions—without changing how inspections are performed in the field.

The Safest Inspection Is the One You Don't Touch

As electrical infrastructure expands to support electrification, renewable generation, hyperscale data centers, and long-distance transmission, systems are operating at higher loads and tighter safety margins.

In substations, powerlines, switchgear, and HVDC converter stations, major failures rarely begin as dramatic events. They typically start with localized electrical stress — corona partial discharge (PD) developing at insulators, conductors, bushings, connectors, hardware or contaminated surfaces.

These early-stage discharges may not produce visible damage, audible noise, or measurable heat. Yet they represent the first step in a degradation process that can progress toward arcing, insulation breakdown, and forced outages.

Effective safety management therefore depends on identifying deterioration before escalation occurs.

Understanding the Escalation Mechanism

Electrical degradation often follows a predictable sequence:

- Mechanical or electrical defects, improper component installation, or surface contamination
- Corona partial discharge activity
- Progressive insulation degradation due to PD
- Arcing or flashover

Once arcing develops - the event can escalate within milliseconds. Consequences may include severe equipment damage, personnel injury, secondary fire, and extended downtime.

From a safety standpoint, the key variable is not reaction speed. It is early detection.

Rethinking Safety: Non-Destructive and Non-Intrusive Testing

In operational power systems, safety-oriented diagnostics aim to evaluate equipment condition without creating additional risk. Two related, but distinct, concepts are important in this context: non-destructive and non-intrusive.

Non-destructive testing refers to methods that assess equipment condition without causing physical damage or accelerating degradation. The asset remains intact and operational after the inspection.

However, a method can be non-destructive while still being intrusive.

Intrusive diagnostics may require:

- Physical connection to the asset
- Installation of temporary sensors or coupling devices
- Access inside restricted or arc-flash boundaries
- Close proximity to energized components

For example, certain partial discharge measurement systems provide highly detailed electrical data but may require sensor installation or direct coupling to the equipment under test. While these techniques do not damage the asset, they involve interaction with energized infrastructure.

By contrast, a non-intrusive method requires no physical contact, no electrical connection, and no modification of the system during inspection.

Solar-blind UV corona imaging meets both criteria:

- It is **non-destructive**, as it introduces no stress and does not affect insulation systems.
- It is **non-intrusive**, as it operates purely optically — without contact, grounding, signal injection, or conductive coupling.

Inspection can be performed from a distance, while the system remains energized and undisturbed.

In high-voltage environments, this dual characteristic — non-destructive and non-intrusive — directly supports risk reduction by minimizing both system disturbance and personnel exposure.

Why Early Corona PD Detection Is a Safety Issue

Corona discharge is not yet a failure — but it is a warning.

At the corona PD stage, corrective action can be scheduled under controlled conditions. Equipment can be cleaned, adjusted, or replaced before insulation integrity is compromised.

If partial discharge continues unchecked, insulation surfaces degrade. In enclosed environments such as switchgear, the transition from discharge to internal arcing can occur extremely rapidly.

From a safety standpoint, the objective is not simply to detect faults.

It is to detect them before personnel are exposed to the conditions that precede arc flash or flashover.

Early detection reduces:

- The probability of arc flash events
- Emergency intervention under energized conditions
- Exposure to unstable or deteriorating equipment
- Unplanned work inside restricted zones

Safety improves when degradation is addressed before it becomes unstable.

Exposure Reduction in Practical Environments

Substations and Switchgear

In substations, corona PD may develop at insulators, connectors, bushings, or conductors.

Traditional diagnostic approaches may require opening panels, installing sensors, or working within arc-flash boundaries.

Remote UV inspection allows evaluation of energized components without physical interaction. No panels are opened. No coupling devices are installed. No direct contact is made.

This reduces:

- Time spent inside restricted areas
- Handling of energized components
- The probability of unintended disturbance

In medium- and high-voltage switchgear environments, where arc flash risk is significant, minimizing physical interaction directly reduces personnel exposure.

Transmission and Distribution Lines

On overhead lines, corona PD may occur due to hardware damage, improper installation, or surface contamination.

Ground-based or UAV-based UV inspection enables detection from offset distances, without climbing structures or installing temporary measurement equipment.

Reducing proximity reduces risk.

HVDC Converter Stations

HVDC systems operate under sustained high electric field intensity. Continuous DC stress can accelerate insulation degradation and surface tracking.

In these environments, proximity itself represents a hazard.

Distance-based optical inspection allows energized components to be evaluated without entering high-field areas or modifying the system configuration. In addition to handheld or ground-based inspection, UV cameras can be deployed on robotic platforms or installed as fixed monitoring systems within valve halls or DC yards.

Robotic inspection enables remote operation in areas where human access may be restricted or undesirable. Fixed installations provide continuous monitoring without requiring personnel presence in high-field zones.

In HVDC yards and converter halls, reducing physical interaction is not simply a matter of efficiency - it is a structured safety measure that lowers exposure and limits the need for repeated entry into energized environments.

Conclusion

Electrical safety depends on two principles:

1. Detect deterioration before escalation
2. Minimize exposure during inspection

Inspection strategy influences both.

When degradation is identified early, unstable conditions can be corrected before arcing develops. When inspection does not require contact or close proximity, personnel exposure is reduced.

Diagnostics that are both non-destructive and non-intrusive support these objectives directly.

Solar-blind UV imaging enables early detection of corona PD while the system remains energized and undisturbed, without physical interaction and without increasing risk.

In high-voltage environments, the safest inspection is not only the one performed early.

It is the one performed without touching the system at all.

Redefining UAV Powerline Inspections

micROM® Integration Options for Aerial Corona PD Detection

Aerial inspections are redefining how critical power assets are monitored, diagnosed, and maintained. OFIL's DayCor® micROM® brings solar-blind UV inspection into the aerial domain, enabling early and precise localization of corona partial discharge faults - long before they become visible to IR or other conventional sensors.
The micROM HD is designed for seamless integration across a wide range of UAV platforms, offering utilities flexible deployment options based on operational needs, regulatory requirements, and mission profiles.

Why micROM for UAV Inspections?
The micROM HD combines:

- **High sensitivity** – High sensitivity to PD detection at 1pC @ 8m, certified by Eurotest lab
- **Remote inspection capability** – Safe inspections from up to 40 meters / 130 ft*
- **HD resolution** – 720p video for detailed imaging
- **Lightweight, compact design** – Supporting longer and faster scanning flights
- **Multiple UAV control protocols** – Including PWM, MAVLink, Ethernet, and UART

*Inspection distance may vary according to environmental conditions and corona PD intensity

Proven UAV Integration Options
OFIL offers integrated, tested, and field-proven UAV configurations for power line inspection.
To support diverse operational requirements, OFIL has partnered with several leading UAV manufacturers and integrators to deliver fully integrated inspection solutions. These partnerships provide seamless integration of the DayCor micROM camera with the drone platform, offering a complete, ready-to-deploy inspection package. Each solution includes full payload integration, synchronized multi-sensor capability where applicable, as well as training, technical support, and deployment guidance, ensuring operational readiness from day one.

RTR (REALTIME ROBOTICS) HERA BY RMUS

A backpack-transportable, NDAA-compliant inspection drone designed for rapid deployment and multi-sensor missions .
Key capabilities:

- Deploys in under one minute
- Supports heavy, multi-payload configurations (up to 33 lb / 13 kg)
- micROM HD fully integrated as part of a multi-sensor inspection package
- Simultaneous operation with thermal and high-resolution RGB cameras
- FLIR Boson radiometric IR (640 × 512)
- Sony ILX-LR1 61MP for detailed visual inspection
- Embedded onboard AI for power-line component detection and tap-to-center targeting
- Optimized for synchronized multi-sensor data capture in a single flight

DJI MATRICE 300 & 350 RTK

A versatile enterprise UAV platform built for professional inspections and mission-critical data capture .
Integration highlights:

- Complete integration package designed specifically for DJI M300 & M350
- Dedicated stabilized PixyO gimbal optimized for micROM HD
- Pre-configured components enabling plug-and-play deployment
- Simultaneous operation with DJI thermal and RGB cameras
- micROM is part of the DJI Enterprise Ecosystem Solution Catalogue

XER TECHNOLOGIES X8

A long-range, hybrid-electric UAS designed for remote power line inspections integrating micROM HD with high-resolution sensing payloads .
Platform features:

- Hybrid-electric propulsion delivering 2.5 hours flight time
- BVLOS-ready with autonomous options
- Quick-release payload system supporting RGB, IR, LiDAR, and UV sensors
- Rapid deployment (up to 3 minutes) with repeatable automated flight paths
- Built-in redundancies and aviation-level safety features
- NDAA-compliant option available

XER Technologies

ARCSKY X55

An NDAA-compliant industrial UAV platform manufactured in the USA, offering a fully integrated and cost-effective solution for micROM HD aerial inspections .
Platform advantages:

- Suitable for government and utility operations
- Hybrid power module available for extended range and longer flight time
- Interchangeable power units for flexible mission planning
- Transportable in a single rugged case with fast setup and teardown
- Supports multi-sensor payloads for inspection and data collection missions

arcsky

Additional Integration Options

Beyond pre-integrated systems, micROM HD is designed for flexible integration with a wide range of UAV platforms, including Pixhawk-based drones and custom aerial solutions .

Integration capabilities include:

- Compatibility with Pixhawk-based UAV platforms and custom drone architectures
- Camera control and data communication via API using Ethernet, RS-232, PWM, and MAVLink
- Video output and streaming supported via HDMI and RTSP
- Compatibility with third-party gimbals such as Gremsy T3, T7, and other stabilized payload solutions
- OFIL provides integration guidelines, documentation, and technical support for additional UAV platforms.

The Operational Impact

By bringing solar-blind UV inspection into the aerial domain and integrating seamlessly with leading UAV platforms, micROM enables:

- Reduced maintenance costs
- Large-scale aerial inspections with fewer ground crews
- Improved worker safety in remote and hard-to-reach areas

When combined with Gridnostic, inspection data — including UV, thermal, and visual imagery - is transformed into actionable insights supporting predictive maintenance, optimized asset management, improved reliability, and operational safety .

Enhanced by **Gridnostic™**, an advanced platform designed to enhance grid reliability through image intelligence. By integrating multi-sensor data including UV, thermal, and visual imagery, Gridnostic transforms inspection data into actionable insights that support predictive maintenance, optimized asset management, and improved operational safety.