UTILITY ASSET INSPECTIONS FROM THE INDUSTRY EXPERTS

Advanced Analytics • GIS Services • Detailed Reports • Actionable Data

PLP INSPECTION SERVICES

PLP Inspection Services utilizes advanced data capture methods, UAS technology, experienced field crews, industry-leading software, and detailed analysis from expert engineers to provide utilities with the industry's most comprehensive asset management solution.

INSPECTIONS BACKED BY OVER 75 YEARS OF INDUSTRY EXPERIENCE

PLP Inspection Services has a unique analysis process which leverages 75+ years of industry knowledge, engineering experience, and utility product design expertise. Our global network of subject matter experts ensures PLP provides the most accurate inspection results no matter where a project occurs.

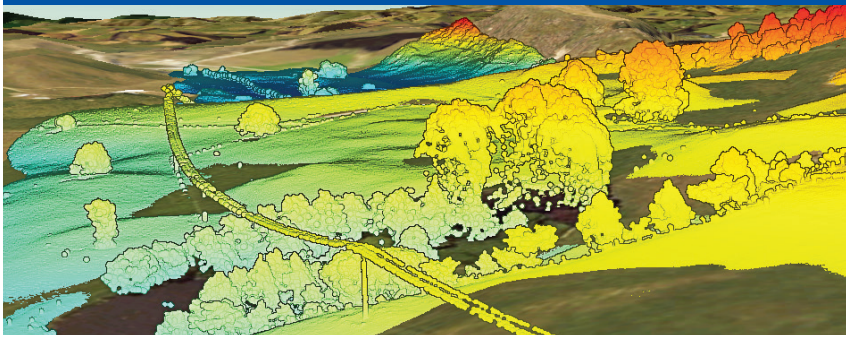
COMPREHENSIVE SERVICES

PLP Inspection Services provides safe and reliable unmanned aerial system (UAS) inspection services for utility assets, including transmission and distribution lines, substations, and generation facilities.

UAS INSPECTIONS

DATA MANAGEMENT AND ANALYSIS

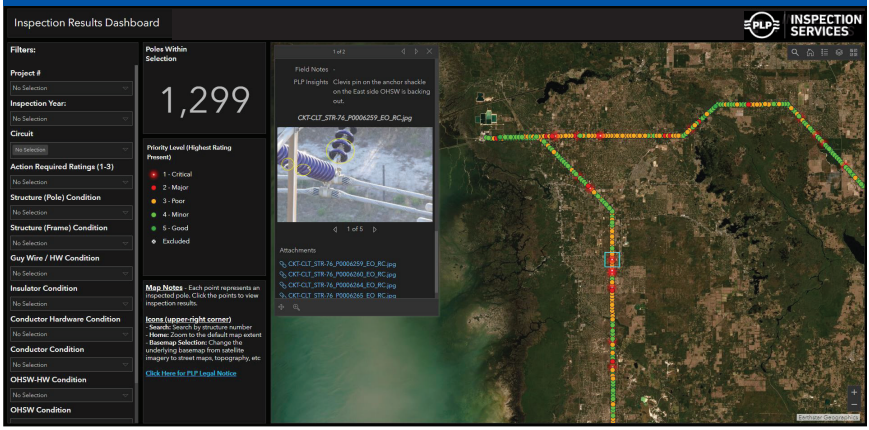
LIDAR SERVICES



INSPECTIONS THAT PROVIDE RESULTS

- 75+ Years of Industry Experience
- Newest Generation of Aircraft and Sensor Payloads
- Cataloged, High-Resolution E/O and IR Imagery
- Advanced AI Processing
- Real-Time Inspection Progress Dashboard
- GIS-Mapped Results
- Actionable Spreadsheets and Summary Reports
- Insured, Part 107-Licensed and Experienced Pilots

GIS-MAPPED RESULTS DASHBOARD



DETAILED ASSET CONDITION SUMMARY

	Structure (Pole)	Structure (Frame)	Guying	Insulator	Conductor - HW	Conductor	OHSW-HW	OHSW	ROW
1 - Critical	0	0	0	0	0	0	10	0	0
2 - Major	8	4	0	0	0	0	18	0	0
3 - Poor	68	59	3	1	5	3	126	7	0
4 - Minor	161	151	5	81	129	7	73	223	17
5 - Good	9	32	9	164	112	236	19	16	229
Assets Evaluate	246	246	17	246	246	246	246	246	246
Assets Needing Action	76	63	3	1	5	3	154	7	0
% of Assets Needing Action	30.9%	25.6%	17.6%	0.4%	2.0%	1.2%	62.6%	2.8%	0.0%

Good Minor Poor Major Critical

INSPECTIONS BY THE INDUSTRY EXPERTS

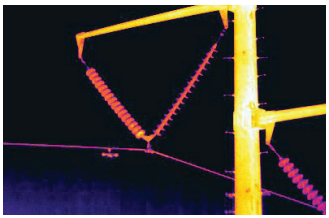
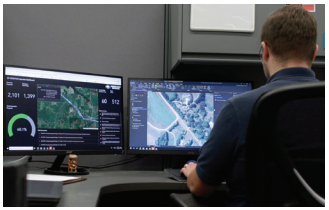


IMAGE COLLECTION

PLP Inspection Services utilizes unmanned aerial vehicles equipped with infrared and electro-optical cameras to capture asset images and survey information.

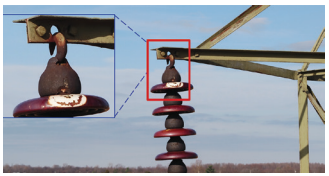
FIELD ENGINEER

Throughout the entire inspection process, an on-site industry engineer monitors the images in real-time and directs certified drone pilots to potential reliability concerns, ensuring the data collected is accurate and timely.



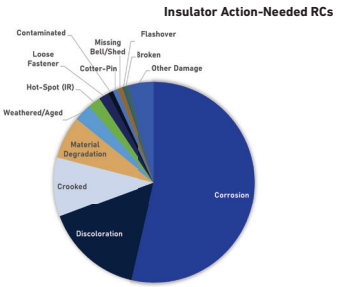
GIS SERVICES

Data is uploaded to PLP's secure servers, and a geographic information specialist maps the results, assigning images to appropriate structures within the system.



DATA ANALYSIS

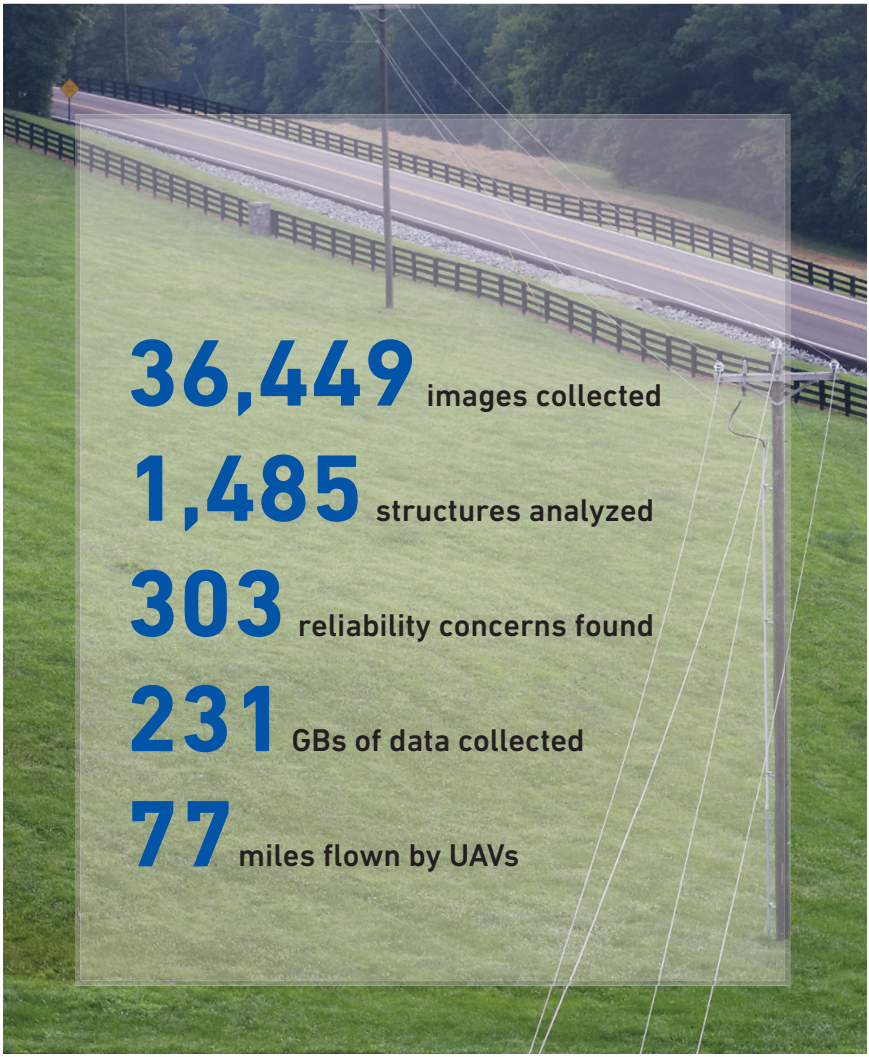
Our in-house, industry-trained data inspection engineers work alongside PLP's knowledgeable subject matter experts to analyze customer data.



ACTIONABLE REPORTING

Every primary system component is given a rating so the utility can quickly prioritize potential reliability concerns and set work orders.

MIDDLE TENNESSEE ELECTRIC PARTNERS WITH PLP TO INSPECT INFRASTRUCTURE ASSETS IN RURAL AREAS



CASE STUDY

Article featured in T&D World, May 2019. Subscribe by visiting **tdworld.com**

By **Adam Seaborn**, Middle Tennessee Electric Membership Corporation

As the second largest cooperative in the nation, Middle Tennessee Electric manages more than 225,000 meters and 12,000 miles of energized line. The cooperative distributes electricity to about 212,000 residential and business members in a large and diverse four-county area just south of Nashville, Tennessee.

With many of the wood poles in the subject inspection area towering at more than 70 ft tall and nearing or exceeding 30 years old, Middle Tennessee Electric focuses on regular ground inspections to identify any issues that could affect reliability. As such, conducting an overhead inspection in this rural area poses a significant number of challenges. To access these structures, the company invested in specialized bucket trucks, but it only has a few of these vehicles within its fleet.

INSPECTING INFRASTRUCTURE

Recently, the company took a time-saving approach by partnering with PLP Inspection Services to conduct a comprehensive aerial inspection of 1500 structures with drone technology. By flying above and alongside Middle Tennessee's infrastructure, drones were able to capture thousands of high-resolution images and vast amounts of data to help detect reliability concerns.

Done the conventional way, the overhead line inspection would have taken 18 months to two years. Because it would take the crew longer to set up the bucket truck than to do the actual inspection, this approach would have been very labor-intensive and time consuming. For example, some of the area was located near a busy area of the city, requiring flaggers to provide traffic control. In just a few weeks, however, PLP Inspection Services was able to complete the project in Woodbury, Tennessee, using drones.

Drones can collect data without disrupting construction sites or impeding traffic flow in urban areas.

IDENTIFYING PROBLEMS

By using drone technology, the team could get a better visualization of the equipment including transformers, insulators and splices. PLP Inspection Services' uses several types of drones to collect data, including a dual vision (two-camera) drone that captures high-resolution electro-optical images and infrared imagery in the same flight. Using high-resolution first-person view goggles, PLP's onsite engineers get a drone's-eye view of the inspection as it occurs.

The PLP Inspection Services crew consists of a pilot, and an industry experienced field engineer. The industry experienced field engineer from PLP worked with a utility lineman to identify major reliability concerns during the on-site inspection process and immediately reported the information to Middle Tennessee Electric's team. PLP also provided an Inspection Dashboard, which allowed the cooperative to monitor inspection progress in real time.

Initially, the group found such issues as hollowed-out poles from woodpecker damage and bolts hanging by the outside of the poles. Also, the drone images revealed chipped insulators, fungus growth on top of the poles, water egress and pole top rot and split crossarms. To discover hot spots, PLP used high-tech infrared cameras, which could find loose connections on devices and splices that had issues.

From the ground, it would have been nearly impossible for the linemen to detect these issues. Instead, they would have to set up the specialized truck to get high enough to spot these problems.

As an added safety measure, PLP pairs a visual observer (a person dedicated to continuously monitoring the drone's path) with each drone pilot.

ANALYZING IMAGES

Following drone inspections, utilities are often left with thousands of images and no specific way to analyze and categorize them. However, one of the biggest advantages of partnering with PLP was the turnkey service they provide. As opposed to Middle Tennessee Electric wading through the vast amounts of data on their own, PLP provided them with the complete analysis and recommendations, a standard feature of the company's Level 1 inspections. This saved the utility an immense amount of time and effort while also allowing it to better use its own resources.

The drone inspection conducted by PLP discovered severe rot on the top of several poles.

To help Middle Tennessee Electric categorize the work orders, PLP's engineers and subject matter experts in Cleveland, Ohio, first reviewed the images to look for anomalies. Next, they drew from PLP's 70-plus years of utility industry knowledge and product testing experience to classify the images and assign each component category a rating. Finally, PLP's GIS Analyst created an interactive map of the service territory with color-coded areas so Middle Tennessee Electric could prioritize work around specific locations and infrastructure assets.

In addition, PLP recorded all of the issues on a spreadsheet and provided a detailed report complete with executive summary, explanation of trends, and examples of common reliability concerns observed. Additionally, all images captured during the inspection were cataloged by structure and delivered to Middle Tennessee Electric. The utility can then easily archive the thousands of images for future reference.

TAKING ACTION

Typically, Middle Tennessee Electric has a six-year maintenance cycle, but as a result of the recent drone inspections, the company worked the pressing issues into its work plans. Based on the recommendations and ratings from PLP, Middle Tennessee Electric prioritized the tasks by ranking them from minor to critical. For example, some issues wouldn't cause an immediate failure and could wait a year or two to resolve. Others, however, could cause an imminent failure if not addressed immediately.

Throughout the company's service territory, four linemen are responsible for the overhead maintenance of Middle Tennessee Electric's system. The company has four main area offices, and each area office has four to six crews of four to five linemen. In addition, three support engineers and two designers work with the field team to identify and solve problems in the field.

When working on these work orders, the linemen can pull up photos of specific poles on their iPads through the work management system. That way, they can more easily visualize the issues and devise a proper plan of action. For example, the Explorer app for ArcGIS allows field crews to access the inspection map from their mobile devices.

In the future, the company may expand the use of drone inspection services to other parts of its service territory to save time and labor hours for its field and engineering teams. By using drones and partnering with a company like PLP, the utility can efficiently inspect its infrastructure in remote locations or even in logistically challenged areas like busy neighborhoods without shutting down traffic.

CONTACT US

Please contact us if you would like to learn more about PLP Inspection Services and how it can help your utility with its maintenance inspections for distribution, transmission, or substation assets.

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