Drone inspections: Utilities use unmanned aircraft to find problems

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For decades, inspecting power lines for defects was a largely manual task—a chore for workers on the ground and crews in helicopters.

But as infrastructure ages, and companies face mounting labor challenges, big utilities are turning to new sets of eyes in the

skies—drones.

Utility companies must inspect their infrastructure regularly to fulfill regulatory requirements. It's time-consuming for inspections to be done manually, and flying piloted helicopters along utility lines comes with its own hazards.

For drone use, "it's hugely attractive and it's one of the fastest growing segments of the commercial drone industry," said Michael Robbins, executive vice president of government and public affairs at the Association for Uncrewed Vehicle Systems International, a drone industry group.

Robbins said aging utility infrastructure, increasingly intense storms and a strained workforce drive the need to do inspections more efficiently. Industry proponents also say drones can reduce fatal helicopter crashes and worker accidents, cut costs, improve data collection and save time.

Drones can get closer to utility lines than piloted helicopters and use autonomous navigation.

Carterville-based charter operator Phoenix Air is one of several companies pitching unmanned aircraft as a more efficient and safer alternative. A division of Phoenix Air started using small battery-powered drones to inspect utility transmission lines three years ago.

Now, Phoenix Air Unmanned hopes to expand its business with larger drones that fly more like helicopters.

The company is seeking approval from the Federal Aviation Administration to use SwissDrone SDO 50 V2s, which are jet fuel-powered rotorcraft that are more than 7 feet long. They could each carry two cameras and a LIDAR (light detection and ranging) sensor for the

inspections.

"It's definitely a more complex aircraft that allows us to fly farther and carry additional payloads," said Will Lovett, managing director of Phoenix Air Unmanned. The drones are still restricted from flying in areas with high population density. "We're not flying over downtown Atlanta," he said.

Most of Phoenix Air Unmanned's work is for Midwestern electric utility Xcel Energy using smaller drones restricted to less than 55 pounds. but Lovett hopes to add more utilities to the firm's client list with the larger drones.

The company plans its next demonstration flight for the FAA in the first quarter of next year along a segment of transmission line in South Georgia in collaboration with Georgia Power.

Lovett hopes for approval to begin using the SwissDrone for utility inspections by the third quarter of 2023.

One of the biggest hurdles to federal approval is that Phoenix Air wants to be able to fly the large SwissDrones beyond visual line of sight, to inspect utility lines much more quickly and efficiently.

"It gets us farther down the power line, it allows us to fly longer—which means we're much more efficient," Lovett said. "We're looking at flying slower and lower—100 feet above the structure—so you can see nuts and bolts." The inspections can also reveal when trees are encroaching on utility lines.

Other companies have gotten broad FAA approvals to fly drones beyond visual line of sight for inspections, including Omaha, Neb.-based Valmont Industries, Israel-based Percepto and Soaring Eagle

Technologies.

Drones could also be used to inspect towers, pipelines, railroads, bridges and highway infrastructure more quickly and safely than by workers climbing structures, hanging from bridges or being hoisted in buckets, Robbins said. Drones could also allow flaws in the infrastructure to be discovered and repaired faster.

"The industry is still in a very nascent stage. We've only begun to scratch the surface of the potential for drones for commercial uses," Robbins said.

The inspection drone market generated $1.9 billion in 2021 globally, according to an Allied Market Research report. That's projected to grow to an $8.6 billion market by 2031, according to the report.

The SwissDrone is so large that Phoenix Air is seeking to fly it as a small aircraft under an exemption, rather than under the typical commercial drone regulations.

The FAA said it thoroughly reviews exemption requests for information such as how it benefits the public and how the operator plans to operate safely.

If Phoenix Air Unmanned gets approval to use the SwissDrone, Lovett said the company is prepared to grow.

The company currently has 16 drones and nearly 20 employees, most of them pilots, but "we would definitely scale up" if the SwissDrone is approved and the company expands, Lovett said. "To expand to two or three other utilities, we would need more pilots, staff, equipment, cameras, drones, vehicles."