

City Talk



A cage drone for use inside boilers.



A crawler robot is sent underground.

DRONES EMPOWER THE UTILITIES AND USERS

I have previously explained how drones and remote devices can help inspect and repair gas risers. The power industry has also put drones and other new technology into extensive use to enhance maintenance capabilities.

For power systems, reliability of supply without interruption is vital. The rising costs of maintenance and long downtime affecting machine availability all add up to pressure to maintain a reasonable tariff.

I still remember my young days as a junior engineer in a power utility, helping to work over Chinese New Year and other major holiday periods, as it was the only time when commercial activities ebbed and power companies could afford to take a boiler and turbine set out of service for inspections and maintenance.

For boilers, the traditional way was to erect a scaffold of some 35 to 50 meters high inside to inspect the furnace tubes, burner tips and refractory bricks.

This could take up to two weeks, putting the boiler out of commission.

A scaffold of this size often costs a few million dollars, but by using a cage drone that can be used multiple times and sets one back just several hundred thousand bob, the ability to supply power is enhanced at minimum cost.

With a drone traversing up and across the inside face of the boiler, the inspection can be performed in just two days, significantly reducing the downtime.

Being able to operate the drone round the clock without limits posed by staff fatigue also helps ensure high accuracy.

Instead of GPS, LIDAR is used to control its path, and the drone is shielded by a carbon fiber cage to minimize damage to the boiler's piping in case of impact.

Equipped with high-res cams, it can get images and record in dark and dusty conditions, and its size puts locations previously difficult to access within reach.

For underground cooling water culvert intakes and discharges, engineering



Nuts and bolts

Edmund Leung



A tree near a pylon is pruned.

teams used to have to enter tight enclosures for visual inspections.

Crawler robots now enable thorough inspections and recording of images for effective maintenance work planning.

For overhead high-voltage power lines, tree branches are a common problem, especially during rainy seasons and typhoons, when they can foul lines, cause short-circuits and interrupt power supply.

Drones used together with a newly developed Vegetation Management Portal, a comprehensive data bank of trees in the vicinity of power lines, and digital analysis enable predictions of their growth and the risks they pose to be classified as high, medium or low.

Maintenance personnel, using tablets, can pinpoint locations where branches may affect power lines, and organize trimming activities to remove potential risks.

This is much more efficient than using human judgement, significantly enhancing the safety of the power system.

There are many more examples of drones and new technology being applied to improve maintenance of the various systems in the power industry.

They enable comprehensive inspections as engineers and technicians can remotely analyse recordings for a full study of the condition of the facilities, allowing them to plan the most effective repair schedule, anticipate problems and deal with them before they affect operations.

Reliable service is the primary objective of power utilities, and the extensive use of drones and new tech such as AI are effective ways to ensure safe, reliable and economic operations, benefiting the company and ultimately consumers.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over features of modern life



A vegetation management portal is used to size up risks.