ABOUT CYBERHAWK

WHAT WE DO
Cyberhawk has been undertaking inspections, surveys and providing visual asset management solutions to the electricity industry since 2009. We support clients to manage their assets, including transmission and distribution towers, substations, chimneys and cooling towers.

TRACK RECORD
Cyberhawk is the world’s most experienced drone inspection and survey company in the electricity utility industry. Having completed more than 20,000 commercial flights, we boast mature operating procedures from our experience conducting inspections on electricity networks and at power stations. We also hold framework agreements with multiple utility companies. Cyberhawk has completed thousands of transmission and distribution tower inspections, collecting data using drones, helicopters and ground patrols and using our industry-leading, cloud-based visual asset management software, iHawk. We have also completed hundreds of substation surveys, and have developed a bespoke iHawk module for their visual asset management.

GLOBAL FOOTPRINT
Operating from offices on four continents, Cyberhawk has completed assignments in more than 25 countries across Europe, North America, the Middle East, Africa and Asia, for some of the world’s largest energy companies.

iHAWK
Cyberhawk’s industry leading, cloud based iHawk Powerline and iHawk Substation visual asset management software takes data captured from drones, helicopters or ground patrols and converts it into powerful and usable management information. Using a map-driven interface and traffic light colour-coded reporting dashboard, iHawk allows easy access to inspection information and trends, with all inspection images and engineering commentary available. iHawk provides ‘one source of truth’, and the evidence required to make informed decisions.
STAGE 1: DEFECT STANDARD CREATION

Cyberhawk’s extensive industry knowledge and experienced engineers provide an engineering consultancy service to assist our clients with the design of their asset management solutions. The output is a defect standard document that can be based on either the client’s existing system, or developed from scratch. This will typically include condition rating scales with an example image against each condition for each component.

This approach:
- Ensures components are captured and categorised to the client’s requirements
- Removes subjectivity in asset condition
- Ensures consistency, i.e. the inspection of tower 1 is completed to the same standard as tower 100

STAGE 1: DEFECT STANDARD CREATION
- Client Agreement
- Training and reference

STAGE 2: DATA COLLECTION
- UAV
- Ground patrol
- Helicopter

STAGE 3: INSPECTION
- Categoriser app
- Governance

STAGE 4: REPORTING MATRIX
- Status at a glance
- Data interface

STAGE 5: iHAWK VIEWER
- Intuitive
- Visual
- “One source of truth”

STAGE 6: iHAWK MAINTENANCE
- Field tablet
- Closed loop process

UPDATE

- 4: Serious Wear/Damage
- 3: Significant Wear/Damage
- 2: Superficial Wear/Damage
- 1: No Visible Wear/Damage

| 4 | Damaged/Welded |
| 3 | Rust/Glue |
| 2 | Bar surface rust > 25% |
| 1 | No visible/quantifiable deterioration or damage |

| 4 | Bars surface rust > 25% |
| 3 | Thin paint/galvanising |
| 2 | No visible/quantifiable deterioration or damage |
| 1 | No visible/quantifiable deterioration or damage |

STAGE 1: DEFECT STANDARD CREATION

- Damaged/Missing
- Rusty/Slack
- Lightly/moderately rusty/with debris
- No visible/quantifiable deterioration or damage
- Bars surface rust > 25%
- Bars surface rust < 25%
- Thin paint/galvanising
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**STAGE 2: DATA COLLECTION**

Cyberhawk’s asset management system can take inspection data collected from multiple sources including:

**DRONES**

Our UAV inspection solution delivers comprehensive close visual inspection and significantly improves safety performance, by reducing the requirement for ‘at height’ working and by limiting our clients’ exposure to live powerlines.

**GROUND PATROLS**

Cyberhawk’s tablet-based inspection application allows the inspection of transmission and distribution towers by linesmen from the ground.

For any data collection method, a plan is created to meet the requirements defined in the defect standard document.

**HELICOPTERS**

Cyberhawk has relationships with a number of helicopter companies which specialise in OHL inspection data capture.

**STAGE 3: INSPECTION**

At Cyberhawk’s inspection centres, teams of industry engineers use iHawk to inspect, categorise and report on the location and condition of each component, in accordance with the agreed defect standard. Our processes ensure efficient analysis and inspection accuracy.

“INSPECTIONS ARE UP TO FOUR TIMES FASTER THAN TRADITIONAL METHODS”
STAGE 4: REPORTING MATRIX

The inspection of transmission and distribution towers generates thousands of high definition images and terrabytes of data. To allow our customers to efficiently use this data and to improve decision making, Cyberhawk has developed a traffic light colour-coded reporting matrix which distils this huge amount of data into a single dashboard. This provides an ‘at a glance’ status of each line, and easy comparison between lines, to aid maintenance prioritisation.

STAGE 5: iHAWK VIEWER

Cyberhawk’s cloud-based iHawk inspection viewer software uses a simple to navigate, map-driven interface which provides intuitive and easy access to all inspection information, including the reporting matrix, the underlying high definition images and engineering commentary.
STAGE 6: MAINTENANCE MODULE

Building on iHawk’s comprehensive inspection data, Cyberhawk’s iHawk Powerline Maintenance Management software allows our clients to query the inspection information, generate works orders and send them to tablet computers in the field. Once linemen have executed the work, images are taken of the repaired problems and uploaded back into iHawk after manager approval.

AMP
Cyberhawk also offers Asset Management Partnerships (AMP) for transmission and distribution tower asset management. Cyberhawk can work with local UAV or helicopter companies, contractors and operators to provide this service globally.

BAR BY BAR REPORTING
Tower inspection can be reported in either a standard format or a bar-by-bar format. In a bar-by-bar report, every individual member of a lattice tower structure is inspected, categorised and reported, so that a decision can be made on whether the replacement of individual bars on a tower is required (typically to National Grid standard TS 3A4.31).

ESQCR INSPECTION & HIGH RISK SITES
iHawk provides a tailored solution for Electricity Safety, Quality and Continuity Regulations (ESQCR) inspection. ESQCR inspections can be completed on iHawk tablet computers in the field, with evidence behind each categorisation, and managed on the iHawk viewer. High risk sites can easily be identified and more regular inspections planned.
CHIMNEY AND COOLING TOWER INSPECTION

Using UAV technology, Cyberhawk captures a series of individual aerial images to cover the full surface of the structure. Advanced photogrammetry software is then used to create accurate 3D models and highly detailed orthophoto mosaics of the chimney or cooling tower. The results are delivered in iHawk as well as traditional formats, which allows the user to visually scan the full height and 360º model, with defects accurately measured and categorised.

SUBSTATION ASSET MANAGEMENT

iHawk Substation is a cloud-based visual asset management system for full inspection, maintenance and repair of all assets, components and parts at a substation. iHawk Substation allows for creation of work orders to conduct inspection or maintenance on all assets at a substation.

A part identified as defective during inspection raises a fault log which can be searched on the Hawk substation system. A repair work order can be generated, which uses the image of the deteriorated part acquired in previous inspection as evidence of the fault. When a repair is completed, a new image of the improved part condition is taken and is updated on Hawk Substation, along with a new condition rating.
We use fixed wing and rotary UAVs to acquire high-resolution aerial images. This imagery is processed using advanced photogrammetry software to generate orthophotos, digital elevation models and panoramic images of a site.

This type of imagery is commonly used for site design, health and safety inductions, evacuation plans, tendering information and as-built photography. All of this can be presented in a web based 360º virtual tour.
HOW CYBERHAWK CAN BENEFIT YOU

SIGNIFICANT COST SAVINGS
• Live inspection means reduced outages
• Pre-outage inspection reduces the length of maintenance outages

OUTSTANDING DELIVERABLES
• Industry-leading iHawk Powerline asset management software and tablet applications
• Inspection centres with teams of industry engineers and industry experts
• More than 20,000 commercial industrial inspection flights completed

HIGHLY EXPERIENCED
• Thousands of transmission and distribution towers inspected throughout the UK, Ireland, Europe and North America
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IMPROVED HEALTH & SAFETY
• Reduction or elimination of working at height
• Less exposure to live lines
• Manned helicopter flights minimised

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CASE STUDY: POWERLINES

OHL INSPECTION IN URBAN AREAS FOR UK ENERGY GIANT

In March 2015, Cyberhawk was called upon to carry out close visual inspections of 40 distribution towers for an OHL energy giant in the South of England. OHL’s asset management software would have been unable to complete this operation due to the towers being within 50m of major roads, meaning Congested Areas Operating Safety (CAOSC) procedures applied. Cyberhawk’s asset management software, iHawk, allowed the client to quickly understand the condition of each tower and access high definition images of each defect, as well as engineering commentary. Cyberhawk’s ability to inspect eight towers per day, versus a linesman who can only climb two to three towers a day, meant the project was successfully completed with significant time and cost savings.

CASE STUDY: SUBSTATION

MULTIPLE SSE SUBSTATIONS

As part of its framework agreement with a large utility company, Cyberhawk provided the electricity transmission and distribution operator with topographic survey data and high-resolution aerial photography from over 30 of its substations all over the northern UK. The projects involved surveys of both new builds and extensions and have been ongoing since 2012. The workscopes typically require orthophotos, panoramics and spherical imagery, acquired on a three-monthly basis, as well as aerial video and aerial oblique images at some sites. The locations, which range from one to 75 hectares, are often in remote areas and active construction sites. Multi-rotor and fixed-wing drones were used to carry out the work, which allowed rapid mobilisation and data capture. The deliverables are accessed through iHawk, which allows all personnel involved in the project access to the data from any location. Capturing regular high-resolution aerial imagery provides the client and all stakeholders with valuable information on the current progress of the project. As well as access for contractors and consultants, to track and monitor, the imagery is used for site orientation, planning meetings and to assist health and safety.
COOLING TOWER INSPECTION FOR DRAX POWER STATION

Cyberhawk was called upon to inspect 12 cooling towers at Drax Power Station, in northern England, the second largest coal-fired power station in Europe. The requirement was to provide a detailed inspection of the external concrete shell and mantels across all cooling towers. It was essential for the cooling towers to remain operational throughout the inspections, meaning Cyberhawk was required to work on site while other activities took place.

Alternative methods for carrying out this scope of work, such as rope access, elevated cradles or scaffolding, would have taken weeks to complete the inspections, and even longer when their erection and dismantling was included.

Cyberhawk’s solution not only mitigated the risks associated with this method, such as working at height, but reduced the inspection times. Normal timescales for this scope of work would be between 1-3 weeks per tower, however Cyberhawk carried out the inspection in just two days. A number of defects highlighted meant the company became aware that structural repairs were required and so had adequate data to outsource this work to a third-party provider.

The results were delivered through Cyberhawk’s asset management software, iHawk. Utilising this software also allowed the team to provide the client with detailed location and accurate defect sizing to +/- 10mm.

NORTH ENGLAND POWER STATION SURVEY

Cyberhawk was commissioned by a major utility company to provide topographic survey data and volumetric analysis at a coal-fired power station in North England. The large site has numerous stockpiles of various sizes and materials which had to be itemised in the volume report.

Surveying the stockpiles remotely provided huge health and safety benefits, by removing the need for ground-based surveyors to work amongst heavy plant on this busy site.

Our rigorous health and safety regime and flight planning procedures were approved in advance by the site owner, and Cyberhawk worked closely with Local Air Traffic Control given the close proximity of a major airport.

The results were delivered through Cyberhawk’s asset management software, iHawk. Utilising this software also allowed the team to provide the client with detailed location and accurate defect sizing to +/- 10mm.