ABOUT CYBERHAWK

The world leader in aerial inspection and surveying using Unmanned Aerial Vehicles (UAVs).

WHAT WE DO

Founded in 2008, Cyberhawk’s highly trained UAV pilots and industry engineers have been undertaking wind turbine and meteorological mast inspections as well as land surveys since 2010.

TRACK RECORD

As the world’s most experienced UAV inspection and survey company, Cyberhawk has completed more than 25 world firsts and undertaken over 13,000 commercial flights. We inspected over 500 blades in 2015 and over 1,000 in 2016, delivering our results through our cloud based visual asset management software, iHawk.

GLOBAL FOOTPRINT

Operating from offices on four continents, Cyberhawk has completed assignments in more than 20 countries across Europe, North America, Middle East, Africa and Asia for some of the world’s largest energy companies.

HIGHLY EXPERIENCED

Our training programme produces highly skilled industry leading pilots, with our offshore pilots undertaking four levels of training with a minimum of 18 months of experience and 500 flights.

SPEED OF INSPECTION

Cyberhawk’s mature operating procedures and highly trained teams mean we can inspect up to six turbines in one day, with an average of four turbines per day, significantly reducing production losses.

ACCURATE DEFECT MEASUREMENT AND POSITIONING

At Cyberhawk’s inspection centres, our teams of industry engineers use cloud based software to inspect, categorise and report on the size and location of defects on all four surfaces of the blade to an accuracy of +/-5mm.

iHAWK

Cyberhawk’s proprietary cloud based iHawk Wind Asset Management software takes drone captured data and converts it into powerful and usable management information. iHawk uses a map-driven interface for intuitive access to all inspection information, reporting matrix with underlying high definition images and engineering commentary.

> 1000 blades inspected in 2016

iHawk, industry leading Visual Asset Management Software

Accurate defect size and position

Average 4 turbines inspected per day

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Globally operating

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WIND TURBINE
BLADE INSPECTION
& ASSET MANAGEMENT

STAGE 1:
DEFECT STANDARD
CREATION

Cyberhawk’s extensive industry knowledge and experienced team means that we can provide an engineering consultancy service to assist our customers with the design of their asset management programmes. The output is a defect standard document which can be based on either the client’s existing system, or developed from scratch and becomes a comprehensive set of guidelines to which all parties involved in the inspection project work to.

This manual will also detail a condition rating scale with an example image against each rating for each component. This approach:
- Ensures components are captured and categorised to the client’s requirements
- Removes subjectivity in asset condition
- Ensures consistency, inspection of the first blade completed to the 1000th blade

STAGE 2:
DATA COLLECTION

STAGE 3:
INSPECTION

STAGE 4:
REPORTING MATRIX

STAGE 5:
HAWK VIEWER

Coating in good condition
Superficial damage to coating
Functional damage penetrating through surface coating
Severe structural damage, shell exposed

Good Condition
Superficial Damage
Functional Damage
Structural Damage
Substantial Structural Damage

1. Coating in good condition
2. Superficial damage to coating
3. Functional damage penetrating through surface coating
4. Severe structural damage, shell exposed
Cyberhawk’s UAV solution delivers comprehensive close visual inspection of the entire wind turbine blade. The benefits of this inspection method include:

- Quick data collection, with an average of four turbines per day being inspected
- Major cost savings through reduced downtime, which in turn means maximised production time
- Visual images are captured 100% of the turbine blade, including all four surfaces.

“INSPECTIONS ARE UP TO SIX TIMES QUICKER THAN TRADITIONAL METHODS”

“DEFECTS MEASURED TO +/-5MM”

From Cyberhawk’s inspection centres, our teams of industry engineers analyse the data collected to categorise and report on the size and location of defects on all four surfaces of the blade, in accordance with the agreed defect standard. Our analysis and quality assurance process ensures inspection accuracy and efficiency, as inspectors only need to view images once to fully analyse.
STAGE 4: REPORTING MATRIX

The inspection of wind turbine blades generates thousands of high definition images and a huge volume of digital 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 page. Providing an “at a glance” status of each wind farm and each turbine blade allows easy comparison to aid maintenance prioritisation.

STAGE 5: iHAWK VIEWER

Developed in-house by Cyberhawk, our cloud-based iHawk inspection viewer software uses a map-driven platform to access all inspection information intuitively and easily, including the reporting matrix and the underlying high definition images and engineering commentary.

AMP
Cyberhawk also offer Asset Management Partnerships (AMP) for wind turbine inspection and asset management. Cyberhawk can work with local UAV companies, contractors and operators to provide this service globally.
LAND SURVEY

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, panoramics, obliques, 360°sphericals and thermal images of a site. This type of imagery is commonly used for site design, health and safety inductions, construction progress, stock pile calculations, evacuation plans, tendering information and as-built photography. All of this can be presented in an iHawk 360° virtual tour.

MET MAST INSPECTION

Cyberhawk has inspected offshore meteorological (met) masts at multiple wind farms. Our skilled offshore pilots and experienced inspection engineers can work from a vessel to provide significant cost savings and improvements in health and safety.
HOW CYBERHAWK CAN BENEFIT YOU

SIGNIFICANT COST SAVINGS
• Up to six times faster than traditional inspection techniques means a turbine can be shut down for as little as 1.5 Hours.
• Our site team remains productive by maximising short weather windows.

HIGHLY EXPERIENCED
• 1000s of blades inspected throughout UK & Europe.
• Work completed for some of the world’s largest operators and WTG manufacturers.
• Framework agreements with tier 1 operators.
• In house experienced wind turbine engineers.
• Certified Technicians (CT) means significantly less on site resource.

OUTSTANDING DELIVERABLES
• Bespoke iHawk Wind management software.
• Defects sized to +/- 5mm and position on the blade to within 0.5m.
• Downloadable, traditional defect per-page pdf report.
• 100% photographic coverage of each blade.

IMPROVED HEALTH & SAFETY
• Significantly reduce working at height.
• All personnel hold relevant safety certificates.
• Highly trained pilots & engineers with mature operating procedures, risk assessments and method statements for work at wind farms.

• Significantly less on site resource.
• Experience inspecting Gamesa, Nordex, Senvion, Vestas, GE and Siemens turbines.

iHAWK PORTFOLIO LIFECYCLE VISUAL ASSET MANAGEMENT SOFTWARE

iHawk, our cloud based software, can be used as a visual asset management tool for an entire wind portfolio. It can be used as a central repository for data on all assets, from blades and gearboxes through to electrical equipment.

iHawk allows the input of blade inspection data from multiple sources including drones, ground based cameras and rope access.
Storing the data in one consistent format allows easy defect tracking over time, as well as access to historic inspection data. iHawk also improves the tracking of blade repairs, by allowing users to mark previously identified defects as being repaired, therefore giving a clear, complete and up-to-date picture of your full asset portfolio.

“More than 30 turbines inspected in less than two weeks”
CASE STUDY: ONSHORE

Cyberhawk was approached by one of the UK’s largest energy suppliers to inspect more than 100 wind turbines throughout the company’s Scottish and Irish wind farms, with minimal loss of operational downtime and in timescales that would allow them to meet yearly inspection targets.

The inspections included close visual inspection of the leading edge, trailing edge, pressure and suction sides of each blade. Specific locations and sizing of each defect were essential in order to determine the damage and prioritise the maintenance required.

Using iHawk allowed the client to quickly understand the condition of its wind farms and access high definition images and engineering commentary, as well as see the severity of the defect for themselves to prioritise repairs and allocate budgets.

The client also reported that Cyberhawk’s technology made a significant improvement to project safety. On at least two occasions turbines were not re-started on site after an inspection was carried out and revealed a safety critical defect.

Cyberhawk’s certified technicians and trained inspection engineers allowed the inspections to take place with minimal client supervision. The client reported a high level of confidence in the autonomous role given to the company’s inspection teams and based on this, as well as other positive feedback, Cyberhawk has been given the opportunity to perform a larger work scope in 2016.

“THE CLIENT REPORTED A HIGH LEVEL OF CONFIDENCE IN THE AUTONOMOUS ROLE GIVEN TO THE COMPANY’S INSPECTION TEAMS”
Case Study: Land Survey

We were chosen by a large independent wind developer to undertake an aerial survey of 450 hectares of proposed windfarm and access road land. The project required us to supply georeferenced orthophotography at 3cm ground resolution and a digital elevation model at 1m grid spacing.

The survey data was acquired using a UAV, which meant there was less time required on site and limited access required across the site.

The site was a large boggy moorland, resulting in difficult ground access, and the survey was carried out midwinter which limited flying time to daylight hours.

Traditional ground-based topographic survey would have taken many weeks and exposed surveyors to risk in the boggy areas of the site. Our aerial imagery allowed further analysis of the site beyond the initial work scope, and there was a significant cost saving over alternative survey methods.

The survey data resulted in the discovery of a previously unknown watercourse. This could have had significant consequences for the project had the client not been made aware of it.

“The survey data resulted in the discovery of a previously unknown watercourse.”
In May 2016, we completed our second visit to Forewind’s Dogger Bank development where our team completed a detailed close visual inspection of two met masts using UAVs.

Dogger Bank is the furthest offshore wind project from UK shores, approximately 150km from the UK coast.

The inspections, which took just one day per met mast, represented a dramatic time saving in comparison with tradition methods which could take at least double the time. Safety levels were also significantly improved by reducing the requirement for personnel to climb the towers and work at height.

“Cyberhawk continues to demonstrate how UAVs can be safely and effectively launched safely and inspection work in the offshore wind sector. We were extremely pleased with the inspection completed and in the quality of the detailed report provided.”

Nachaat Tahmahkera, Forewind Operations and Safety Manager