

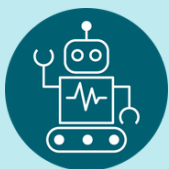
# MODERNISING INSPECTIONS

Reshaping Wind  
Turbine Blade Testing  
with Drones

## THE INSPECTION CHALLENGE

In blade testing, inspections are critical. Engineers must manually record and track blade damage across different phases of testing, often repeating the process up to 20 times during a full campaign.

These inspections are complex and involve capturing full surface photography, video and thermal imaging followed by a full visual inspection of the external and internal surfaces, as well as monitoring the assemblies and equipment.



### LABOUR INTENSIVE

Team of engineers and technicians required to capture and analyse data.



### PROJECT COSTS

Inspections represent a significant cost over a full certification test campaign.



### INSPECTION QUALITY

Inspections must be of high-quality to ensure readability and no damage is missed.

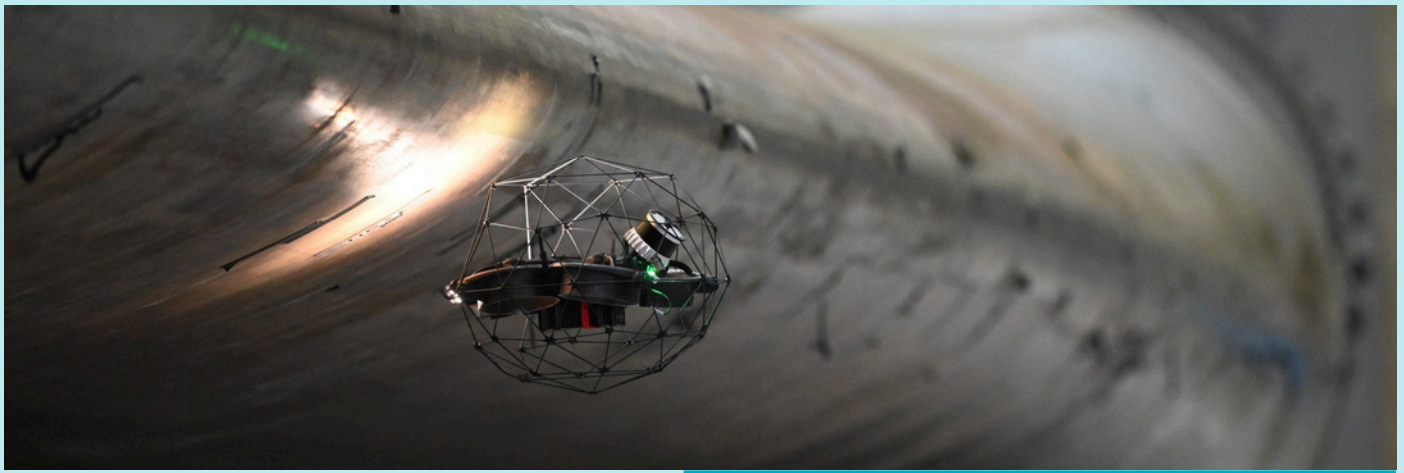
## THE DRONE SOLUTION

Drones are often associated with recreational activities and defence but they are quietly revolutionising turbine blade inspection by replacing high-risk, high-cost, human inspection with autonomous, remote systems.

Despite being a relatively novel technology, drones are steadily proving their value in ways that matter: cutting costs, saving time, and reducing human error.

Drones are powerful tools purpose-built for confined, GPS-denied environments, making them ideal for wind turbine blade inspection. Equipped with LiDAR, high-resolution cameras and the ability to manoeuvre through tight spaces, drones solve various blade inspection challenges.

By combining images with advanced data analytics, they can enable the detection of defects faster and safer than ever before.



## OUR OFFERING


ORE Catapult is a vital blade inspection partner. By utilising drones we can enable faster, safer, cheaper and more accurate inspections, whilst minimising turbine downtime and improving maintenance planning.

We aim to help operators enhanced turbine life and productivity by defining and proving optimised operation and maintenance protocols.

Key services offered by our drones include:

- Visual data - Capture full surface images and video to identify and document damage.
- LiDAR-based 3D mapping - Generate point cloud 3D models.

## CONTACT US

 **Offshore Renewable Energy Catapult**  
**National Renewable Energy Centre**  
 Offshore House, Albert Street  
 Blyth  
 Northumberland  
 NE24 1LZ

 [info@ore.catapult.org.uk](mailto:info@ore.catapult.org.uk)

**CATAPULT**  
 Offshore Renewable Energy

## THE REAL WORLD IMPACT

We estimate that utilising drones can reduce the amount of time and personnel required for turbine blade inspections and reduce costs by up to 40% on 80+ metre blades.

2

Personnel required for inspections

45

Minutes per external inspection

UP TO 40%

Cost reduction on 80m+ blades

## FUTURE WORK

As drone-assisted inspections continue to streamline blade testing, further advances can be made in automation and data intelligence. By combining advanced image analysis with inspection data, significant gains in efficiency and insight are possible.



### Autonomous flights:

Provide repeatable inspections for faster delivery



### Automated damage detection:

Develop code to identify damage in snapshots captured by the drone, reducing engineering review time.



### Damage growth tracking:

Develop software to track the progression of damage over time.