

3D Drone Digital Imaging,
Visualisation and Virtual Reality
Solutions

OffshoreEnergy

A decorative graphic consisting of several overlapping, glowing blue wavy lines that flow horizontally across the lower half of the slide. The lines vary in opacity and intensity, creating a sense of motion and energy.

OffshoreEnergy

Project Management and Engineering Solutions

Presentation

- About Us
- Digital Imaging Technologies
- Data Use
- Background
- Aerial Inspection
- Microsoft HoloLens
- Use of Drones to Capture Data
- Photogrammetry
- 3D Modelling
- Thermal Imaging
- Company contact details

OffshoreEnergy

Project Management and Engineering Solutions

About Us

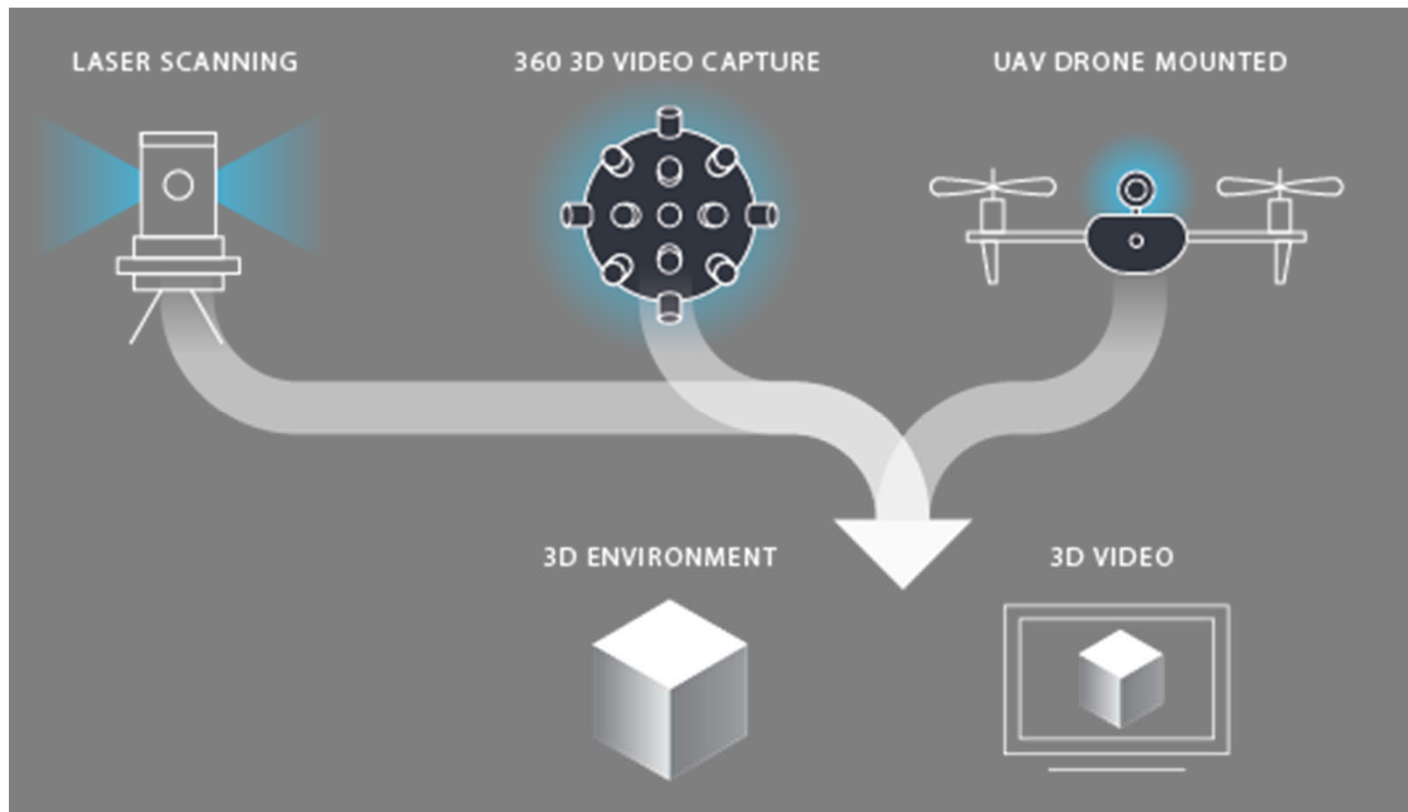
Offshore Energy provides integrated project management and solution-based engineering services to the Oil & Gas, Subsea Telecommunications and Renewable Energy industries worldwide. We plan, design and deliver projects in challenging environments, creating the most effective and efficient solutions for our clients.

Our personnel are highly competent and have significant industry experience. Engineering is at the heart of everything we do, and our engineering team is key. This engineering focus adds value to projects by exercising the rigour necessary to mitigate and manage risks, which facilitates innovative and creative thinking needed to deliver complex, demanding and often ground-breaking projects.

Our engineers can be involved throughout the life cycle of your project, from initial FEED through kick off, design, onshore planning, offshore installation and project completion.

Digital Imaging Technologies

Using the latest digital imaging technologies, we can eliminate dimensional uncertainty by capturing reality. Once digitized, a site can be interrogated and visualised in new immersive ways.



OffshoreEnergy

Project Management and Engineering Solutions

Data Use



We can unlock the value of 3D data by making it accessible in a number of ways



2D CAD



3D MODEL



VIRTUAL REALITY



TRAINING

OffshoreEnergy

Project Management and Engineering Solutions

Background

Offshore Energy were early adopters of 3D laser scanning and LiDAR technologies. We have embraced the latest 3D data capture, 3D modelling and visualisation techniques.

We can provide large and small scale 3D technology solutions to owner / operators, asset managers and engineers across the oil & gas, petrochemical, built environment, defence and renewable sectors.

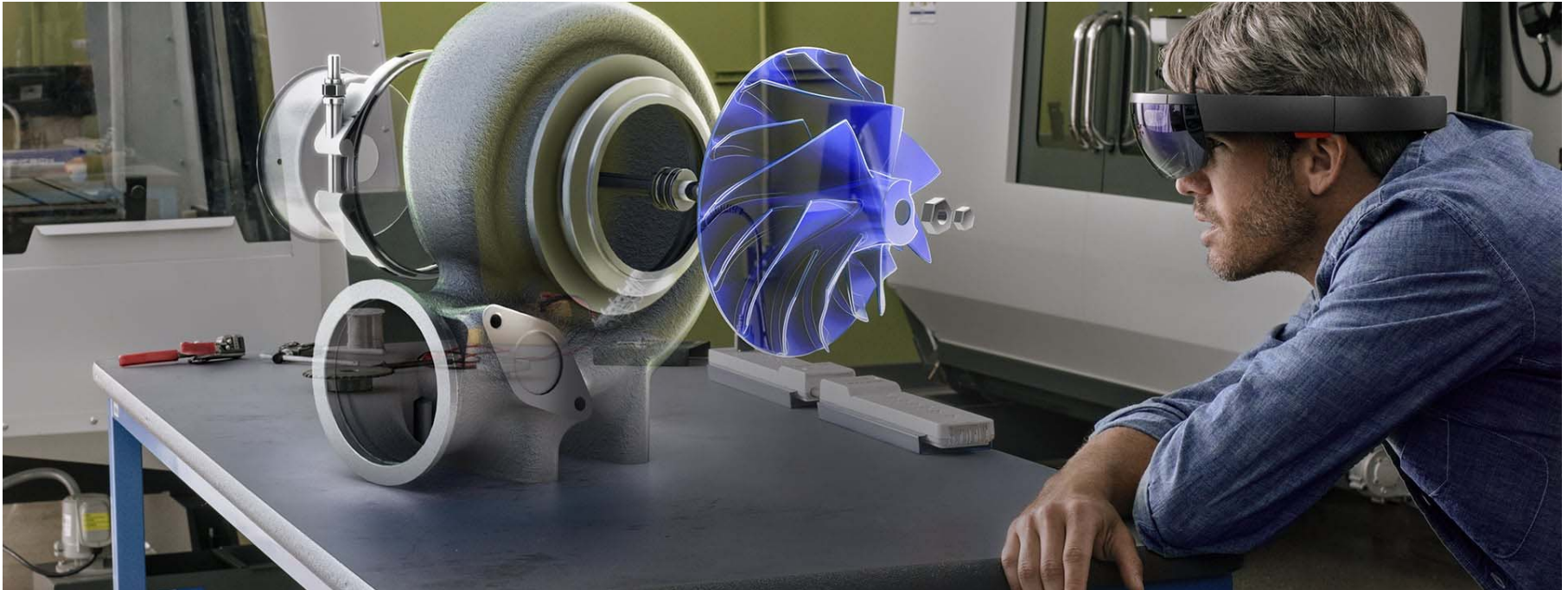
Aerial Inspection

Offshore Energy is developing a 3D aerial inspection system to integrate with our mixed reality interface. The system will allow rapid accurate data collection, interrogation and analysis. Engineers will be able to visualise turbine data as 3D holograms, allowing inspections to be carried out virtually. Data will be available at the touch of a button to enhance analyses.

OffshoreEnergy

Project Management and Engineering Solutions

Microsoft HoloLens



Mixed reality encompasses a wide range of experiences with people, places, and objects from your physical and virtual worlds merged in a blended environment. We have been pioneering the use of virtual reality, augmented reality and mixed reality to enable us to transform our clients' business processes by transitioning to fully integrated digital workflows and platforms.

OffshoreEnergy

Project Management and Engineering Solutions

Use of Drones to Capture Data

We are working towards a bespoke drone capture system specifically suited for turbine inspection. The drone is equipped with a range of sensors to provide different 3D imaging capabilities which can be customise for specific project requirements.



Photogrammetry

Using the latest high definition Digital SLRs and proprietary photogrammetry processing algorithms, we can create high accuracy textured 3D meshes and surface models of the turbine primary structure and blades.

Live Offshore Video Streaming

We can employ a number of different aircraft depending on the prevailing conditions, with telephoto / zoom lens if required.

We can operate several aircraft in sequence to ensure we can maintain full visual cover, which can be dynamically controlled remotely. We can provide up to five drones with five pilots and ground crew, command and control, and administrative support. We design and build our own drones for specialist technical applications.

OffshoreEnergy

Project Management and Engineering Solutions

Use of Drones to Capture Data

Live Offshore Video Streaming

We can operate up to 400ft height and 500m range within UK waters. In international waters there are no limits (within reason), however, there is little benefit outside this range.



We aim to be as close to the subject as reasonably practical to maximise battery endurance and shorten the handover flight, and therefore increase time on the station.

OffshoreEnergy

Project Management and Engineering Solutions

Use of Drones to Capture Data

Live Offshore Video Streaming continued

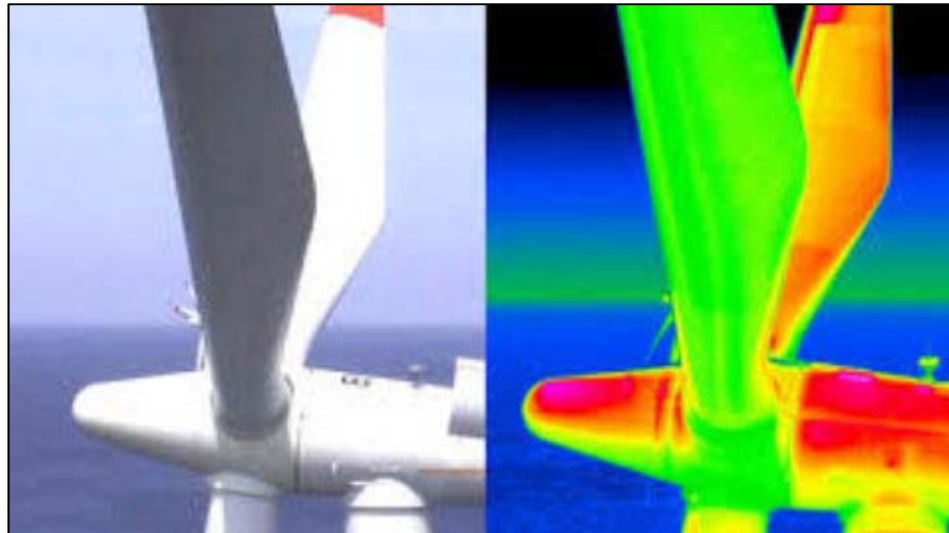
Up to four hours of continuous coverage by airborne drone camera can be provided, depending on wind conditions (we can operate up to 20kts of wind speed) and rain (the system is inoperable if the objective lens gets wet). We can provide 4K or HD video as well as the live 720p downlink.

To enable live remote viewing, the HDMI live feed can be taken out of our systems and converted to a data stream for transmission over satellite, operated by a switch controlled by the pilots. Taking into account a ship's transmission capabilities, the crew, shift duration and operational parameters are tailored as needed.

Use of Drones to Capture Data

Thermal Imaging – Offshore Wind Turbines

Heavy wind and air pressure changes have a great impact on laminated rotor blade material. The continuous influence of cyclic loadings will lead to cracks and an ongoing degradation process will affect blades. Frequently changing loads will produce temperature differences in blades during rotation, indicating high stress or stress release in different areas. We can use thermal imaging to detect and visualise these defects.

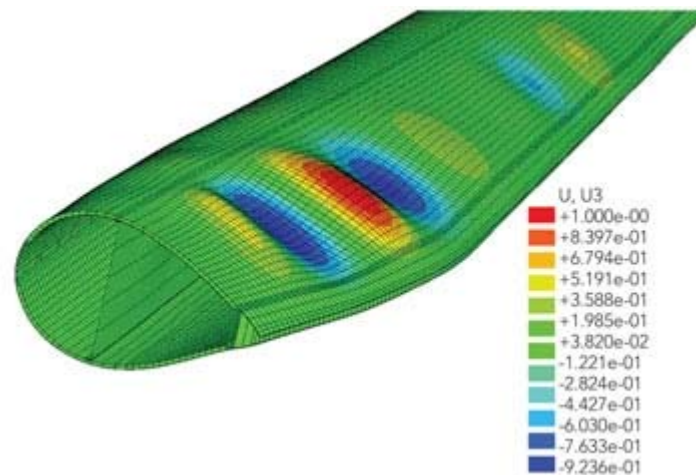


3D Modelling

Photogrammetry creates a dense polygon mesh of the surface. We can reverse engineer this into an accurate as built model for further interrogation downstream in a range of 3D CAD or finite analysis (FEA) packages. These data can be used to build up an accurate record of wear and tear over time, which may affect the geometry.

Deviation maps

Once the blades are modelled they can be aligned to a design model and compared to create a range of deliverables, such as visual 3D deviations charts or traditional 2D deliverables sections / plans. By applying complete surface and feature inspection, a comparison can be made against the 3D CAD model and the model can be used for verification to ensure parts meet tolerance, functional and performance specifications.



Mixed Reality 3D Interrogation

Data sets and results can be viewed in real time augmented 3D at pre-determined scales, down to 1:1. This allows an unprecedented level of inspection and analysis. Models can be shared and managed with multiple users looking at the same holographic 3D dataset. This opens up new possibilities for detailed analyses and collaborative working.

By simply applying different 3D lighting, different visual filters allow defects, and wear and tear not visible to the naked eye, to be identified and evaluated.

OffshoreEnergy

Project Management and Engineering Solutions

Contact

Richard Turnbull

E-mail Address

Richard.turnbull@oel-uk.com

Telephone

+44 776 419 1753

UK Office

Company Address

Ground Floor
15 Bowling Green Lane
London
EC1R 0BD
United Kingdom

Telephone

+44 (0) 203 478 3968

E-mail

info@oel-uk.com

Web

www.oel-uk.com