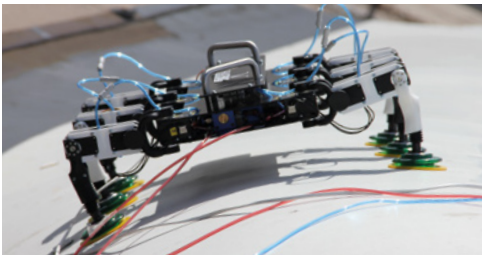
CATAPULT
Offshore Renewable Energy

ROBOTICS AND AUTONOMOUS SYSTEMS



As the UK's leading technology innovation and research centre for advancing wind, wave and tidal energy, ORE Catapult is at the forefront of developing new products and services for the offshore renewable energy sector.

New and existing robotics, autonomous systems (RAS) and artificial intelligence (AI) technologies can be used to improve the operations and maintenance of offshore renewable energy infrastructure.

RAS Benefits

// Increased access to wind farms due to reduced dependency on weather conditions.

// Reduced O&M costs through a reduction in the requirement for offshore vessels and crews.

// Improved Health & Safety by removing workers from potentially dangerous conditions offshore.

Our Services

We offer a full range of state-of-the-art robotics and autonomous systems testing, demonstration and validation services at our facilities in Glasgow, Blyth and Levenmouth.

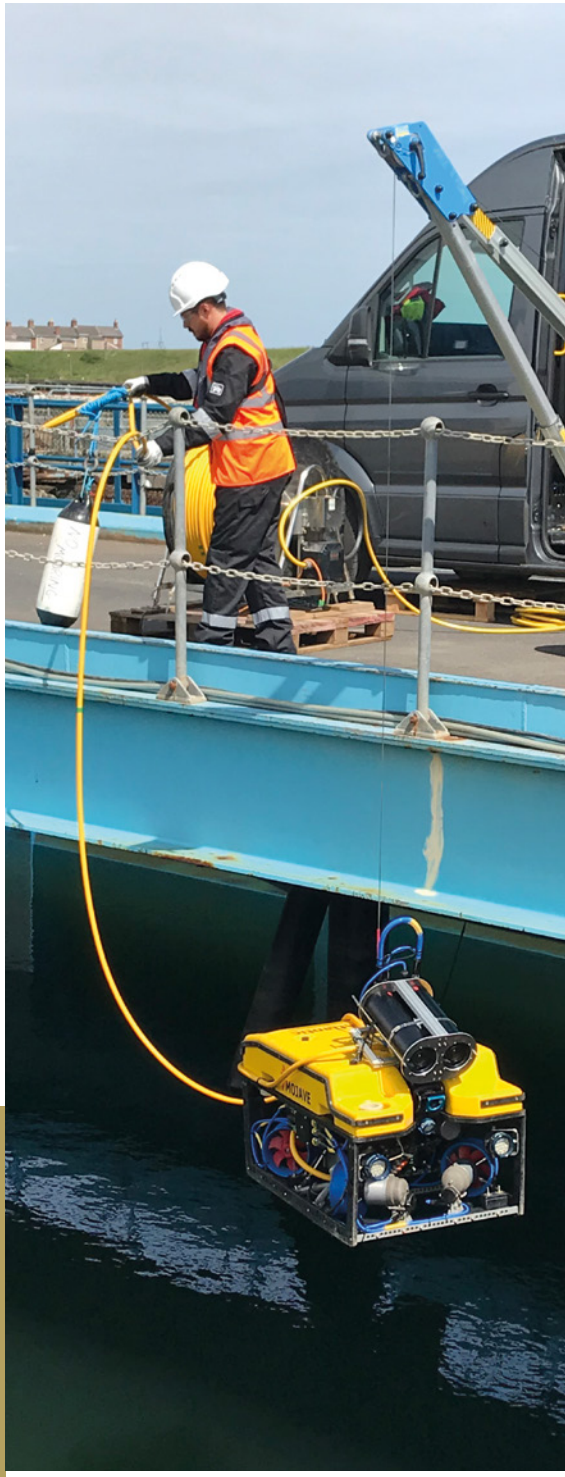
We can offer...

// A testing environment that emulates real-world conditions

// Testing, demonstration and validation for subsea, surface, contact and aerial autonomous inspection systems.

// Representative testing to evaluate the performance of drones for blade inspections using our Levenmouth 7MW Demonstration Turbine

// Independent assessment of the technical and commercial benefits of RAS technologies using our comprehensive O&M cost benefit analysis model.



Our Future Vision //

As robotics technologies become more established in the offshore renewables sector, the need for commercial test, demonstration and validation facilities will increase. ORE Catapult will meet this demand with state-of-the-art full-scale facilities dedicated to RAS.

Subsea operations

Our unique still water dock testing facility features a replica seabed and offers the potential for deployment of scaled and representative offshore wind farm infrastructure, such as cables and foundations, allowing developers of RAS to carry out trials in a controlled, representative environment. Our experienced marine engineers and technicians have the expertise to replicate the conditions found on an offshore wind farm – boosting bankability and investor confidence in innovative solutions that perform well. Examples include a seabed survey using an Autonomous Underwater Vehicle (AUV) or Unmanned Surface Vehicle (USV).

Our NOAH offshore met mast is located approximately three nautical miles off the coast of Blyth and provides the opportunity to demonstrate RAS technologies in a real world operating environment. Examples include the subsea inspection of the met mast foundation and survey of the surrounding seabed using an AUV.

Inspections and repairs

Our facilities can enable the testing, validation and de-risking of RAS systems that are used to perform inspections and repairs. Our existing facilities that are used for the structural and mechanical testing of major turbine components, including blades and drivetrains, can be adapted and used for RAS technologies.

Our 50m Blade Test Facility and 27m turbine Training Tower in Blyth provides a controlled environment for the testing of technologies designed to inspect the surface and subsurface of wind turbine blades and the 7MW Levenmouth Demonstration Turbine offers a real-world operating testing environment suitable for demonstrating a technology's suitability and readiness for use in the industry.

Aerial operations

Our 7MW Levenmouth Demonstration Turbine provides the perfect platform to test, validate and demonstrate aerial RAS technologies for remote turbine inspections, for example Unmanned Aerial Vehicles (UAVs).

The Catapult has been collaborating with the offshore wind industry and UAV service providers to develop industry guidelines for validating the quality of images gathered by UAVs for blade inspections. Based on comprehensive testing performed at the Levenmouth Turbine, ORE Catapult can provide an independent assessment of UAV technologies to ensure they meet minimum industry requirements, helping to validate their performance and suitability.

Instrumentation Testing

In addition to platform testing, our assets can be used for the development and testing of RAS instrumentation, for example novel sensors for inspections of turbines and foundations. We operate our own UAVs that can integrate with test sensing equipment.

Market assessment

ORE Catapult can objectively assess market potential. We offer independent assessment of the technical and commercial benefits to be gained from using robotics and autonomous technologies developed in the supply chain and academic spheres – for example, our comprehensive O&M cost model can be applied to assess the cost-saving potential of implementing robotic solutions.

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