

CATAPULT
Offshore Renewable Energy

CIRCUIT

Autumn / Winter 2015 | Issue 6

Collaborate Innovate Benefit

In this issue

Unlocking technology innovation

UK SMEs bring high growth potential and economic benefit

Collaborative R&D programme

Innovative project generates impact for the offshore sector

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Research project updates

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We work with
Innovate UK

Innovation Challenges

We have identified a number of specific technology innovation challenges within the offshore renewable energy industry, the resolution of which we believe will help drive down the cost of offshore renewable energy, and have a positive impact on the UK economy.

Find out more at
ore.catapult.org.uk/innovation-challenges

 **@ORECatapult**



Welcome

The Autumn/Winter 2015 edition of our in-house magazine, **Circuit**, is published at a time of uncertainty for the offshore renewable energy sector, as we await the outcome of the UK Government's Comprehensive Spending Review, commitments to future Contracts for Difference and ongoing changes to the wider regulatory support mechanism.

It is therefore more important than ever that we, as an industry, communicate loudly, clearly and consistently on the areas of certainty that we can offer the UK. That is affordable, secure, low carbon energy delivered with the creation of many thousands of jobs and billions of pounds of economic value not only from a sustainable UK supply chain but from exports of technology, knowledge and services for decades to come.

The UK remains the most attractive offshore wind market in the world, and the industry is making great strides in reducing costs. As we go to press, we have just heard that the Green Investment Bank has reached a second close on their offshore wind fund, bringing the total investment to date to £818m and with the introduction of a number of UK and EU pension funds. The confidence of the international finance

community to invest in our industry – and the risk averse pension sector in particular – is a tremendous endorsement of the work to reduce risk and resultant cost.

Here at ORE Catapult, we are focusing on driving cost reduction through technology innovation, in part through providing support to small and medium-sized innovators to increase their business productivity, encourage innovation and help drive future economic growth. We do this by providing access to expert technical capabilities, equipment and other resources required to take innovative ideas from concept to reality, and generate economic growth.

We work collaboratively with industry innovators, large and small, to help develop their ideas into market ready technologies, and tackle some of the industry's major technology challenges to drive down the cost of offshore renewable energy. We do this by pushing out to industry our 'Innovation Challenges' - specific technology innovation challenges directed at the offshore wind, wave and tidal sectors, the resolution of which we believe will drive the industry a considerable way towards our own vision of 'abundant, affordable energy from offshore wind, wave and tide'.

In return, working with ORE Catapult provides SMEs with an unparalleled understanding of industry need and direct route to market to commercialise their technology, as well as an independent and credible endorsement of their technology.

All this is creating a more rounded proposition for industry in the areas that really matter – enabling us to build up a solid knowledge base and expertise in key areas, sharing that knowledge for the wider industry benefit, and driving technology innovation that will ultimately drive down costs.

This edition of **Circuit** coincides with two major conferences that have a strong SME focus – our third Cross-Catapult SME event in Glasgow at the end of October, and Innovate 2015, 9-10 November at Old Billingsgate, London. These major industry events will allow entrepreneurs to meet experts from the Catapults and wider industry, explore innovative ideas, and discover new export opportunities. I hope to meet many of you there, and please do

get in touch with us if you would like to discuss how the Catapult network can support your business.



Andrew Jamieson, CEO

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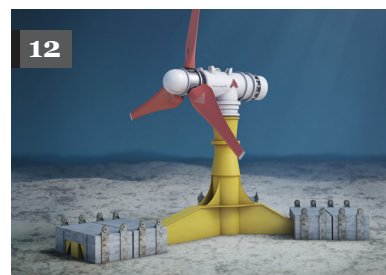
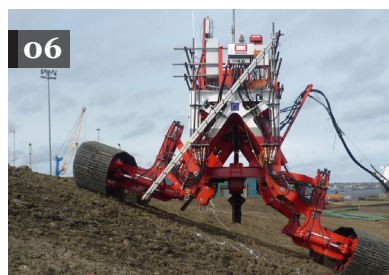
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Front cover image courtesy of Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) part of the HVM Catapult.

CATAPULT
Offshore Renewable Energy

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UK SMEs are the key to unlocking technology innovation and growth

In our mission to drive down cost and risk of the offshore renewable energy industry, we are constantly looking to accelerate the pace of bringing new innovations to market. Our industry has a Levelised Cost of Energy (LCoE) target of £100/MWh by 2020, and post 2020 more will be required. From increased turbine reliability, better maintenance strategies through to new materials and construction methods, the pursuit of cost reduction is happening on many fronts. Often it is the SMEs who are able to react to opportunities first, and ORE Catapult is acting as an effective magnet to attract the best of them.



TRAC AdvantEDGE repair solution for LEE



Blade Dynamics' D78 prototype blade arriving at the Catapult's test facility in Blyth

Case study

Our Blade Leading Edge Erosion programme is an excellent example. We are leading a £1 million, 24-month project to tackle leading edge erosion, a major industry concern. We have developed a deep, technical understanding of the issues involved and of what the solutions need to look like, and are now leading the joint industry approach to developing solutions, running innovation challenge calls and drawing on specialists from academia and industry to ensure that the programme benefits from the leading expertise in the field.

UK SMEs are the key to unlocking technology innovation and growth

The Catapult network, comprising 10 centres of excellence in high growth areas, was established by Innovate UK and the UK Government following recommendations by renowned entrepreneur Dr Hermann Hauser. Hauser, like many others, recognised the important role of SMEs in driving innovation and growth, and the role the Catapults can play in supporting them. As technology and innovation centres we bring together the best of UK businesses, scientists and engineers to transform ideas into new products and services to generate economic growth. Key to growth is transforming small and micro companies into medium size businesses.

At ORE Catapult, we know that SMEs will be the driving force for much of the innovation in offshore renewable energy which is needed over the coming years. Being smaller and more agile means SMEs can respond quicker to market opportunities, undertake research and development faster, and be more creative in their thinking. Supporting SMEs and the supply chain to gain access to the market with products is key to creating a long-term, sustainable industry ultimately free from uncertainties of Government support.

Rising to the challenge

The Catapult is already proving effective in channelling the creativity and inventiveness of the SME community into the areas that really matter through our Innovation Challenges. Using our expert technical and market knowledge, we shine the light on the win-wins where significant cost reductions can be had and where there is strong market demand for a solution. Being close to the industry – asset owners, Original Equipment Manufacturers (OEMs) and the supply chain - we are in a unique position to understand their needs. Every day our in-house technical teams see real, current

industry innovation challenges which need to be addressed.

In responding to these Innovation Challenges, innovators can be assured that, if they get it right, there will be a customer for a developed product. We have a high bar, but innovators who are selected through our challenges receive access to our technical experts and we'll work together to secure the investment needed to drive their technologies to the next level. We're looking to collaborate on new ventures too, where the fit is good for all concerned. We'll commit time and resource in return for a share of future revenues once commercially successful.

The major players in the industry, from wind farm owner/operators to OEMs, are already seeing the potential for innovation challenges and are beginning to use this approach to source specific solutions and explore opportunities. They are seeing the value in early engagement - taking the opportunity to shape challenges prior to launch, and in some cases funding their creation. This creates highly effective market pull that will transform the pace of innovation in our sector.

Regional engagement

ORE Catapult is now actively working on expanding our Innovation Challenge calls into the UK's regions. We already work in collaboration with regional organisations involved in innovation and economic development, and we are establishing strategic partnerships and investing resources to focus on SME-led innovation at a regional level.

Our regional engagement strategy works with Local Enterprise Partnerships, Economic Development bodies and Devolved Administrations across the UK. Together we spot potential in the local supply chains. We already have ORE Catapult

Regional Coordinators embedded in Wales and the South West of England who are developing partnerships with funding bodies and local supply chain organisations - promoting and establishing joint collaborative projects which aim to address current Innovation Challenges. For the innovation community this means ORE Catapult's front door is much closer than before.

We need you!

Our live challenges for offshore wind, wave and tide are already published on our website, and we keep these updated as new work allows us to get more precise around the opportunity or problem out there. We want industry, large and small, to come forward with ideas to address these challenges, and work collaboratively with our own team of technical experts and test and demonstration assets to develop them into market-ready technology.

Innovation and our challenges aren't just about inventing new technologies either; we know there will be existing technologies and methodologies that can be used to solve the technology challenges facing our industry today. Therefore, we also work with established supply chain players to capture lessons from other industries such as oil and gas, automotive, shipping and aerospace, to apply their technology solutions to our particular industry issues. There will be new areas coming soon too, hot topics include gull tagging, floating offshore wind, scour, grouting and structural health. To engage with ORE Catapult, and rise to our innovation challenges, visit <https://ore.catapult.org.uk/innovation-challenges>.

RETA programme brings economic benefit and impact for offshore sector

Technology innovation is essential to deliver lower cost and more reliable offshore renewable energy. However, one of the biggest barriers for new suppliers into the offshore renewable energy sector is their inability to demonstrate the financial and technical viability of their products.



IHC Engineering Business Ltd's Hi-Traq demonstration vehicle

RETA programme brings economic benefit and impact for offshore sector

Over the past few years, ORE Catapult has been delivering a £1.9 million innovation programme - Renewable Energy Technology Accelerator (RETA) - part funded by the European Regional Development Fund (ERDF) to foster collaboration within industry and the supply chain. The project has to date supported more than 90 companies in North East England to raise awareness of collaborative research opportunities and develop new products across the supply chain for the offshore renewable energy market.

Two major innovative products which benefited from funding and were developed as part of this programme include IHC Engineering Business Ltd's inter-array cable trencher demonstration research vehicle (Hi-Traq) and a Smart Cable Development project delivered by Tecnalia, JDR Cable Systems Ltd and PDL Solutions (Europe) Ltd.

Hi-Traq

IHC Engineering Business Ltd recognised they could drive down costs by increasing productivity, efficiency and extending operational weather windows to conduct successful installation and operation and maintenance (O&M) procedures. They designed a purpose-built Hi-Traq trenching vehicle, capable of operating in shallow water conditions and various topographies (including sand waves). The vehicle also has greater manoeuvrability and traction capabilities and a unique self-levelling system to cope with the harsh environments found at offshore renewable locations.

The project, which won the award for 'Mechanical Engineering Product of the Year' at the British Engineering Excellence Awards with support from a number of leading North East England engineering companies, has enabled a new innovative product to be introduced to the market, in line with industry requirements, and

allowed significant cost reductions and time efficiencies for the deployment of new offshore wind farms.

Smart cable

Due to a high amount of offshore grid infrastructure failure, such as cable fatigue and damage, the smart cable development project was established to improve knowledge of installation methods and reduce the O&M costs associated with subsea power cables. The project enabled the design and development of a novel research subsea power cable which included fibre optic technology to monitor performance and to understand potential impacts during offshore cable deployment operations. This project is still ongoing but longer term it is hoped that this research will support the market to analyse potential risks of installation methodologies in various seabed environments.

Regional engagement

Throughout the programme, the Catapult has also delivered regional engagement activities, such as technology workshops, and provided ongoing knowledge transfer and due diligence support to a variety of companies, including Invisotech, Tekmar Energy and North East Composites.

At our National Renewable Energy

Centre, Newcastle-based Invisotech, developed and successfully trialled an innovative Remotely Operated Vehicle (ROV) for use on wind turbine towers. The ROV has been fitted with a Non-Destructive Testing (NDT) probe and high-definition video equipment to carry out detailed remote inspections of weld seams, providing interpretive analysis in terms of potential maintenance requirements. The inspection vehicle can also assess the level of damage on wind turbine blades that can suffer severe erosion in offshore environments. By integrating these technologies, it is predicted that the ROV will reduce the overall O&M costs associated with these procedures, especially as it can be utilised when the turbine is still operating; delivering a safer, more efficient and cost effective inspection process for high-value assets.

Ken Storey, Invisotech Product Director, said: "We are very grateful to ORE Catapult for their support and commitment in helping Invisotech and our development partners in bringing this technology to the renewable energy sector.

"Maintaining high-value asset integrity is of prime importance to our potential wind industry clients and this ROV is one example of where Invisotech can bring new technology to meet their current objectives and future needs, and play its part in

RETA programme brings economic benefit and impact for offshore sector

helping to drive down the levelised cost of wind energy.”

Similarly, the RETA programme supported Tekmar Energy in the development of a collaborative research project to review novel cable protection concepts for the deployment of tidal arrays in Scotland. This project was in addition to the product testing, demonstration trials and installation techniques on their TekLink® and TekTube® J-tube replacement system carried out at ORE Catapult. This allowed them to demonstrate how their product can make a key industry contribution to reducing risk and installation time, reducing costs as well as raising the awareness of their technology to key clients.

James Ritchie, Chief Executive Officer, Tekmar Energy Ltd, commented: “It is essential to fully test our products and allow

our clients and their partners to familiarise themselves and have input into the design and installation procedures in a controlled environment.

“Developing and proving our products prior to field installation is a key component in maintaining our leadership and this, combined with the ability to access high quality facilities such as at the Catapult, gives us a unique industrial advantage.”

Under the programme a number of companies such as North East Composites have also benefitted from specific renewable energy training. Confined space training is one such necessity, and is required by wind farm operators when allowing personnel to enter a nacelle or work on a wind turbine tower in order to complete O&M inspections and repairs. As a result of this work,

a number of technicians are now employed on a sub-contract basis by O&M companies on windfarms across the UK and Europe.

When launched in 2013, the RETA programme was unique, adopting a revolutionary approach to supporting and collaborating with SMEs in the North East of England. The success of the programme is an excellent example of how ERDF funding and industry investment has benefited innovation and allowed SMEs to diversify into a new market sector and foster economic growth, as well as enabling greater UK content in the marketplace. It has assisted over 80 companies with knowledge transfer and support for the development of innovative products and services aimed at the offshore renewable energy sector, helping to reduce costs and improve technology reliability.



Invisotech's ROV being tested at Blyth



ORE Catapult and Blade Dynamics... the story so far

UK innovators Blade Dynamics have had a ground-breaking year, and it's not over yet.



Arrival of Blade Dynamics' D78 prototype blade to the Catapult in Blyth

ORE Catapult and Blade Dynamics...the story so far

August saw ORE Catapult's test, demonstration and research facility in Blyth – the National Renewable Energy Centre - take delivery of Blade Dynamics' prototype "D78" wind turbine blade ahead of a planned six month testing programme. The world's first 'modular' design advanced assembly offshore wind turbine blade is set to increase output, reduce weight and lower costs.

October saw GE acquire the innovative turbine blade designer, underlining a renewed commitment from the US company to offshore wind power and support for cutting edge wind technologies.

Formed in 2007, Blade Dynamics is a British company that develops and manufactures a new generation of large, low-weight wind turbine blades. The company has an innovative design and manufacturing approach that is fundamentally different to that used in other blades today.

Based in Chilworth, UK, with further manufacturing and design facilities at NASA Michoud in New Orleans, USA, Blade Dynamics' blades use smaller, separately manufactured components, compared to the full-length mouldings used in conventional blades. These are then assembled to deliver a high-performance blade, with cost savings and extensive supply chain benefits.

At 78 metres, the D78 has been supported with funding from ETI since 2012 and will be the longest blade yet to be tested in our 100 metre test hall.

There are multiple new technologies in the D78, including a lightweight and high dimensional accuracy blade tip with built-in leading edge protection, which will enable larger, more effective turbines with reduced weight and higher performance. The blade technology has been designed and engineered for simplicity of

manufacture in order to ensure better control of quality. The modular technology also brings significant benefits for the supply chain as the final stages of the manufacturing process can be completed close to the installation or deployment site, allowing manufacturing to be distributed around the country and providing a route for the future export of blade components from the UK.

Pepe Carnevale, CEO, Blade Dynamics, said: "ORE Catapult's National Renewable Energy Centre has world-class facilities and is Blade Dynamics' partner of choice for full-scale blade structural testing.

"This high performance 78m modular assembly blade will undergo static and dynamic testing here in the coming months. Independent verification that the technology is reliable is an important step in the progression towards serial installation.

"Making these steps, with assistance from ORE Catapult, is key for Blade Dynamics. It will drive the introduction of this technology to the market and support all the sustainable job creation, export-led economic growth and reduction in the cost of offshore wind energy that the technology can deliver."

Tony Quinn, ORE Catapult's Operations Director, said: "This is the longest blade, and certainly the most innovative in terms of design, that we have ever tested at our facility in Blyth. Our range of test methods

help to reduce risk in new blade designs and generate confidence in their performance.

Following a successful testing outcome for the D78, Blade Dynamics will actively explore demonstration opportunities for their 78m blades, and are in talks with ORE Catapult about potential opportunities around the 7MW demonstration turbine in Levenmouth, Fife.

Blade Dynamics is also an important member of the industry steering group in our joint industry project tackling wind turbine blade leading edge erosion. The BLEEP project is coordinating industry wide initiatives to reduce the adverse impact of blade leading edge erosion on the operational performance of offshore wind turbines.

The innovative blade designs of Blade Dynamics are a great example of innovation in the UK being recognised on an international stage and we look forward to being able to continue to support their technology innovation and future growth to drive down the cost of offshore wind.

Atlantis powers on with development of next generation turbine



Atlantis Resource Ltd's AR1500 tidal turbine

Atlantis powers on with development of next generation turbine

Our seas represent an abundant marine energy resource, which has the potential to deliver around 20% of the UK’s current electricity needs. Building on the UK’s established marine engineering heritage, MeyGen’s Inner Sound tidal stream array in the Scottish Pentland Firth is positioning the UK as a global leader in tidal development.

ORE Catapult is currently working on a variety of marine renewable projects in order to galvanise and support the development of the sector. One such example is the €1.3m Eurostars project in which the Catapult is working with Atlantis Resources Ltd, majority owner of MeyGen, to develop and execute a testing and validation programme on their new drivetrain system for the next generation AR1500 (1.5MW) tidal turbine. The turbines will be installed in the Pentland Firth as part of the MeyGen Project.

This is a significant project for the Catapult. In 2012 Atlantis successfully tested its prototype AR1000 1MW turbine using our 3MW tidal turbine drivetrain test facility. In just two weeks of testing, the international marine energy developer secured performance data equivalent to four months of tidal exchanges. This testing proved key to accelerating and progressing the development of the next generation AR1500 (1.5MW) tidal turbine.

The latest six week sequence of tests, which will again utilise the Catapult’s 3MW tidal turbine drivetrain test rig to simulate the dynamic forces the turbine will experience during operation, is due to start in early 2016. The rig will undertake dynamic load testing of the AR1500 drivetrain system, which will allow Atlantis to prove the reliability and validate the performance of their drivetrain system in realistic, controlled operating conditions prior to deployment in the Pentland Firth.

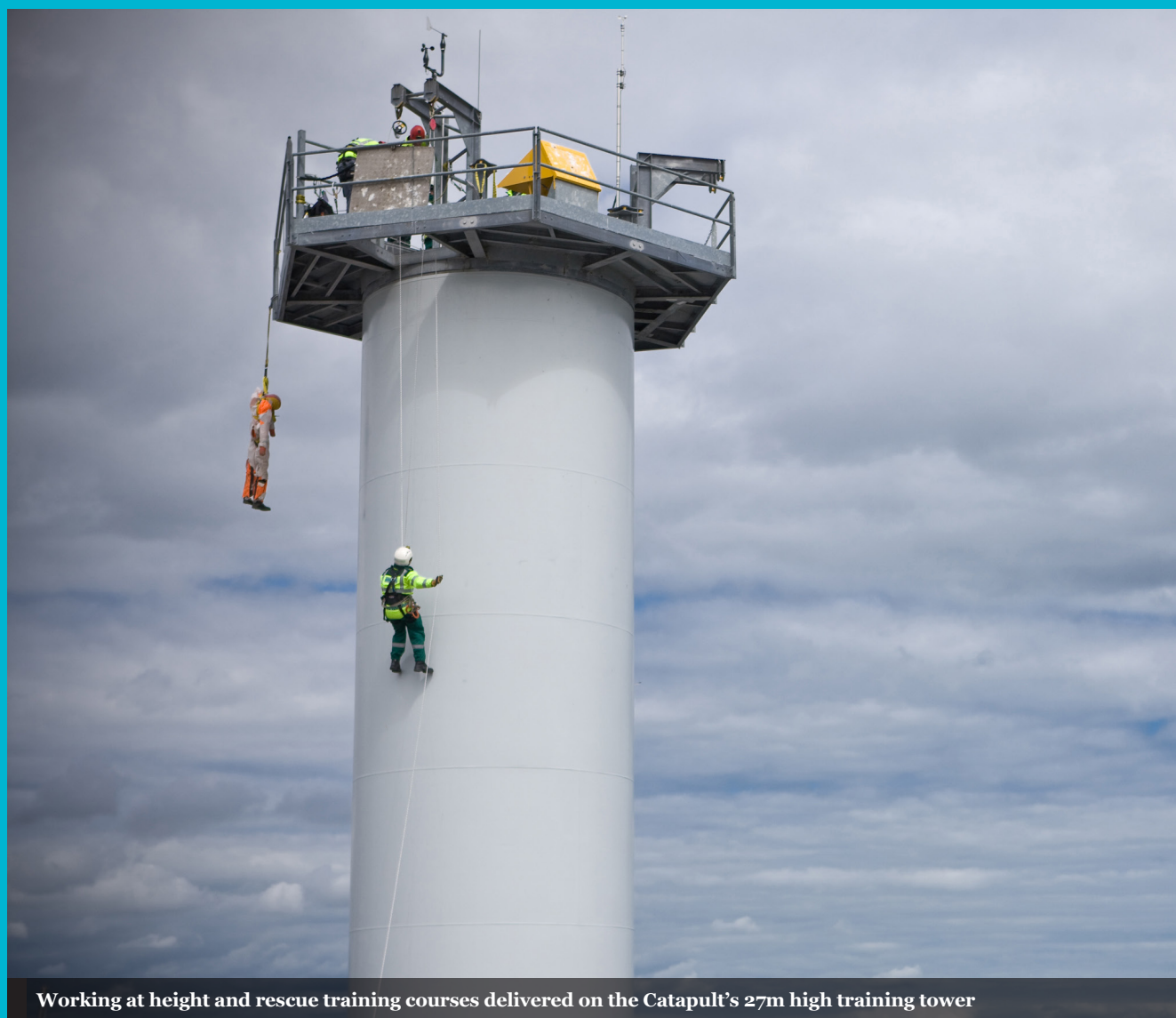
Preparations for the test ahead of the turbine’s arrival are well underway. ORE Catapult and Atlantis are working together to refine and develop the test plans based on Atlantis’ testing requirements. The design of the steelwork required to hold the turbine in position during the test is currently being finalised.

Luke Murray, Design Director, Atlantis Resources Ltd, commented: “We are delighted to be working with ORE Catapult again. Being able to test the

performance characteristics of the turbine, validate the control system, and prove the AR1500’s reliability prior to deployment is a critical element in the technology’s development lifecycle and will provide the market and investors with value-added confidence.”

ORE Catapult is delivering a variety of marine renewables projects which will be featured in the next edition of Circuit, more information on these projects is available on our website <https://ore.catapult.org.uk/our-projects>

Offshore skills training is key to servicing the sector



Working at height and rescue training courses delivered on the Catapult's 27m high training tower

Offshore skills training is key to servicing the sector

From construction through to operations and maintenance (O&M), the offshore renewables industry demands a wide range of skills and qualifications in order to service activities over the entire lifetime of a wind farm. It is vital to keep everything running reliably and efficiently, undertaking preventative maintenance and fixing problems quickly in order to maximise the amount of power generated.

To deal with this complex challenge, the offshore wind and marine sector must have sufficient and well trained personnel to appropriately service the equipment and carry out crucial operations and maintenance (O&M) and installation procedures.

Despite the north east of England having a strong track record of servicing the oil, gas and marine engineering sector, ORE Catapult identified a skills shortfall for offshore renewables. Consequently, over the past two years, it has been delivering health and safety and technical training in a range of disciplines such as working at height and rescue training, non-destructive testing, blade inspection and repair and IRATA rope access for north east companies in order to help them access crucial supply chain opportunities and diversify their business into the offshore renewable energy sector.

To date, more than 199 technicians and 200 small businesses in the North East have benefited from a European Regional Development Funded project (ERDF) related to offshore wind and marine training. One of the project's success stories is Cramlington-based Dynamo Electrical. As a result of receiving working at height, confined spaces and other offshore renewable energy-

relevant courses such as MIST and BOSIET, the company has been able to more than triple its workforce to 38 members of staff and apply some of their electrical testing and certification skills to the sector. They have also successfully won a substantial asset management contract as a result of the direct support received.

James Madden, Dynamo Electrical Managing Director, said: "I am really grateful to ORE Catapult for the support and training they have provided. The training we received has opened up a wide range of opportunities and allowed Dynamo to diversify into the offshore wind and marine sector and ultimately improve our profitability.

"As a small business, any support available is really appreciated. This project has had a direct and positive impact on our continued success."

Helen Armstrong, ERDF Programme Manager, said: "I am delighted with how the project has gone. As someone who is passionate about the North East, it's been great to deliver a successful project dedicated to supporting local companies and realising some tangible benefits for the region.

"Many of the companies we have helped have commented

that their business is now better placed to apply their new and transferable skills, and bid for contracts in the offshore wind and marine sector as a direct result of receiving this and other innovation support projects delivered by ORE Catapult. This can only be a positive result for the region."

Project snapshots

Knowledge Collaboration Innovation

Tidal turbine collision sensor development

ORE Catapult is working with Censis, an industry-led hub of excellence for sensor and imaging systems, to explore the opportunities offered by sensor technologies in determining whether a strike on a subsea tidal turbine is from an object or marine mammal. Present technologies can detect strikes but cannot make this important distinction without additional costly monitoring equipment.

The study, which will include a consultation exercise with teams from across the marine energy industry, will investigate the feasibility of adapting and developing existing sensor technology. The results are due at the end of 2015.



Working in collaboration with



New Analysis and Insight reports service launched

We've launched a new series of regular Analysis and Insight reports, designed to provide you with relevant, actionable advice on key offshore renewable energy industry issues. We produce Market Analyses; Key Issues papers; Long Papers; Standard Papers; Case Studies; Predictions and Market Responses linked to ORE Catapult's project and research activity and in response to key industry events.

To register for free and access the content which we will be publishing regularly, visit <https://ore.catapult.org.uk/analysis-insight>

Two new reports are available through the portal:

- **Operations and maintenance in offshore wind:**
Key issues for 2015/16
- **Marine Energy Electrical Array Analysis:**
A financial appraisal of options



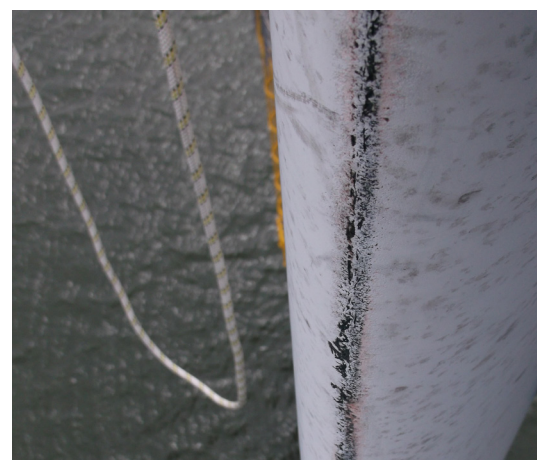
Project snapshots

BLEEP

Our major joint industry project to tackle blade leading edge erosion is bringing together industry and academia, promoting collaboration and knowledge sharing to try to minimise the impact this industry challenge has on offshore wind revenues and energy costs.

A key element of the BLEEP programme is to develop a deep understanding of the sector's blade innovation challenges and then feed this information into the industrial and academic supply chains to stimulate new and improved technology solutions. ORE Catapult then engages and collaborates with innovators to accelerate the development and commercialisation of their technology by utilising our sector knowledge and technical expertise, and making our testing capabilities available to innovators.

ORE Catapult is currently supporting 22 SMEs through the BLEEP innovation challenges, including GEV Wind Power and TRAC Renewables.



Next generation floating wind technologies - Lifes50+

ORE Catapult is a key partner in the European Horizon2020-funded programme LIFES50+. The project, led by Norway's MARINTEK, will run for 40 months and will focus on proving the innovative technology that is being developed for floating substructures for 10MW wind turbines at water depths greater than 50m.

The first step in the project will be to optimise and qualify, by early 2017, two floating substructure concepts for 10MW turbines. The consortium partners have chosen to focus on large wind turbines as these are seen as key to reducing the cost of energy generated from offshore renewables.

ORE Catapult will lead on the uncertainty and risk management work package of the project, evaluating the risks associated with the substructures being developed and designing and developing a risk assessment methodology for floating substructures. Ultimately, the project will facilitate innovation and competition in the industry, reduce risks, and therefore contribute to a lower levelised cost of energy.



Working in collaboration with



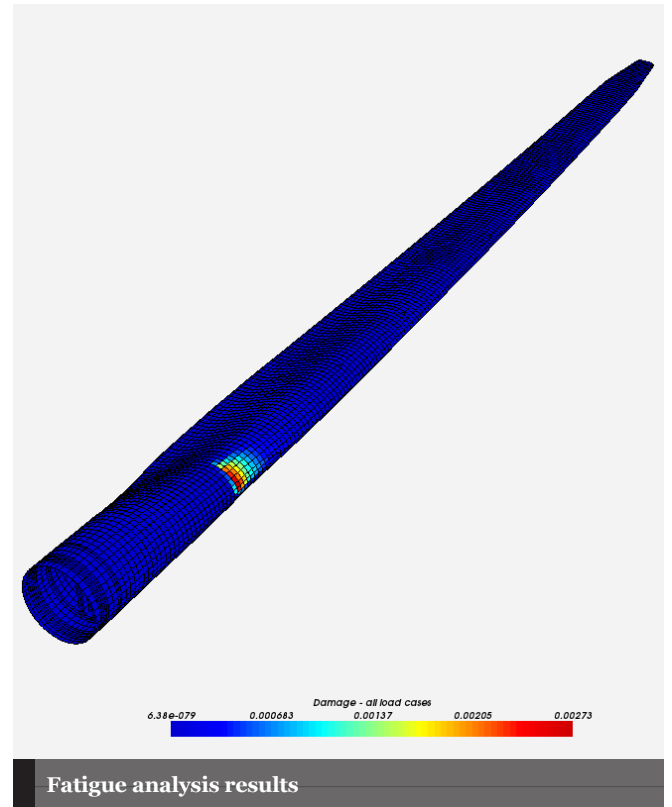
News round-up

Catapult's new bespoke blade fatigue analysis software certified by DNV GL

A project to develop a new bi-axial blade fatigue testing method, aimed at reducing fatigue test times by almost a half and overall test times by a quarter, has achieved an important milestone after receiving certification from DNV GL for the software being developed by ORE Catapult.

The two year collaborative Knowledge Transfer Partnership project between ORE Catapult and Durham University, which was partly funded by Innovate UK, is developing a method to optimise the design of fatigue tests - which are used to demonstrate that a blade can survive its design lifetime - and enable bi-axial blade testing.

Certification of the ORE Catapult software by DNV GL provides vital assurance to clients that the results the new test method will generate will conform to industry standards and guidelines. This paves the way for the next phase of the project, which is to use the software to demonstrate a bi-axial test at full scale using the Catapult's blade test facility in Blyth, Northumberland.



ORE Catapult boldly goes with new ESA Space Ambassadors

ORE Catapult will host European Space Agency (ESA) Ambassadors for its Integrated Application Promotion (IAP) programme as part of an opportunity to identify and facilitate offshore energy needs that can be fulfilled and supported by space assets.

This activity, part of ESA's broader network of Ambassador Platforms, is aimed at all aspects of the offshore energy industry, not just renewables. The purpose of the Ambassador Platforms is to raise awareness of the ARTES 20 (Integrated Applications) and ARTES 3-4 (Satellite

Communication Applications) programmes and to identify, promote and deliver feasibility studies and demonstration-scale projects.

The Ambassadors, Callum Norrie and Kevin Worrall, will encourage potential partners to engage with the ARTES programmes and help bidders get projects accepted, acting as a liaison between final users and partners who are interested in providing a service using multiple space assets.



News round-up



Green Investment Bank and ORE Catapult announce collaboration agreement

ORE Catapult has signed a three year agreement with the UK's Green Investment Bank. The two organisations will work together to drive investment into offshore renewable energy through greater understanding and management of the associated risks, reducing the cost of energy from offshore renewables.

The Memorandum of Understanding sets out how the two organisations will bring their areas of expertise to bear on lowering the levelised cost of energy (LCOE) and identifies areas on

which they will initially work together, each aimed at addressing specific perceived risks in investment in offshore renewable projects. Each organisation will also benefit from direct access to the technical expertise of the other, avoiding the costs of developing non-core internal capability.



ORE Catapult launches Renewable Energy Facilities portal

ORE Catapult has recently launched a Renewable Energy Facilities portal (<http://renewableenergyfacilities.co.uk/>) providing access to a wide range of research, testing and development facilities and installations throughout the UK.

It can be used by offshore renewable energy developers and researchers to accelerate technology development by facilitating access to the UK's testing and research facilities.

Our search facility allows users to identify relevant and specific test facilities and organisations and display them on a interactive geographic map.

Each facility entry contains information on technical capabilities, facility specifications, access conditions, use of equipment and facility contact details.

If you would like to add your facility to the database or make any comments or suggestions, please email ref@ore.catapult.org.uk

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