Offshore Wind Seminar Theatre

Wednesday 22 May 2013

Offshore Wind

10.45-11.15 **Unlocking 66kV inter array systems for offshore wind**
John Edwards, General Manager, High Voltage Products UK, ABB

11.15-11.45 **Offshore wind turbine compliance tests performed for onshore costs**
Peter Clive, Technical Development Officer, SgurrEnergy Ltd

Offshore wind turbine power performance tests confirm that the relationship between incident wind resource and power output conforms to the warranty. These tests are perceived as prohibitively expensive when undertaken using masts in compliance with IEC 61400-12-1. However, the tests can be undertaken using scanning Lidar installed on the transition piece of the test turbine, which obviates the need for an expensive platform for a met mast, allowing critical acceptance testing to be conducted for costs more typical of onshore installations. This contributes to de-risking the project by demonstrating the compliance of the assets with the warranty, giving confidence in pre-construction estimates of power production.

The Key Learnings from this session:
- Offshore wind power represents relatively novel technology installed in poorly understood conditions at high cost, and as such, acceptance testing is more rather than less urgent than onshore
- However, the cost of conventional met mast based acceptance tests have inhibited these
- Scanning Lidar acceptance test techniques are available which provide the necessary comfort for a fraction of the cost of met mast based techniques

11.45-12.15 **TAS – a step change in safe offshore access**
Jon Mears, Project Manager, Houlder Ltd

Recently awarded the Offshore Achievement Award for Safety Innovation, TAS is a patented motion compensated platform that provides a safe and stable point of access to offshore structures such as turbines. Twinned with bow rollers to dampen vessel motions the solution is currently deployed on a 24m Turbine Transfers workboat. Previously presented at All Energy during development, this is an opportunity to hear of trials results and operational data from a solution that's widely recognised as vital to the safe operation within with offshore renewable energy sector.

The Key Learnings from this session:
- Learn how TAS's motion compensated gangway and dampening technology operates in UK windfarms
- Understand the reality of wave height and vessel motions and the implications for safe and comfortable transfer
- Hear from users first hand about the award winning new technology

12.15-12.45 **Assured Reliability and lowest cost of ownership through measurement of wind turbine bolted joints**
Rod Corbett MSc,MIM,C.Eng, Managing Director, James Walker Rotabolt

This bolted joint paper explains how major improvements in assured reliability /reduced design and operational cost can be achieved. Measurement systems are illustrated that have 25yrs experience on offshore oil and gas operations and have been delivering unprecedented reliability and reduced operational cost on machinery and equipment whose important bolted joints are similar to those found on an offshore wind turbine.

The Key Learnings from this session:
- The major parameters in bolted joint reliability.
- The importance of measurement in fastener installation
- Reducing costs and improving reliability of current wind turbine operations

12.45-13.45 **Break**

13.45-14.15 **Offshore wind turbine access – the MaXccess family**
Dr Tony Trapp, Managing Director, OSBIT Power

The cost of offshore wind must reduce. Weather down time is a major problem with access being denied for up to 50% of the time. MaXccess T12 and T18 systems provide safe and effective docking for wind farm support vessels. Two T12 systems are operating on UK wind farms and experience is encouraging. A T18 system has now been built with part funding from DECC. For more remote offshore wind farms larger accommodation vessel solutions may be used. The MaXccess HBS system is being developed and full scale land trials of the concepts have been carried out.

The Key Learnings from this session:
- The need to reduce 'weather days' safely
- Operational experience with MaXccess systems
- New MaXccess technology for Round 3

14.15-14.45 **European Offshore Wind Deployment Centre (EOWDC) - participation opportunities**
Morag McCorkindale, Chief Operating Officer, Aberdeen Renewable Energy Group (AREG)

The purpose of the EOWDC is to prove the new technology, processes, operations and maintenance methods and other disciplines required to enable the timely and cost effective delivery of UK and European ambitions in offshore wind deployment. The presentation will address the learning opportunities associated with the project and supply chain and research organisation potential participation.

The Key Learnings from this session:
- R & D training opportunities associated with EOWDC
- Development framework for new business
- Participation opportunities

14.45-15.15 **Offshore wind turbine structural and foundation monitoring**
Mark Hassell, Business Development Manager, Strainstall UK Ltd

Outline of the early problems encountered with offshore wind turbine foundations and the monitoring solution provided to keep check of any deterioration in the foundation state. Configuration of the monitoring systems, the parameters measured, and the wind farm sites where monitoring is being used. Data recovery and transmission methods, and skill set requirements for the installation teams.

The Key Learnings from this session:
- Problems encountered with early Offshore Wind Turbine Foundations
- Sensor configuration and parameters measured
- Installing systems in difficult offshore environments

15.15-15.45 **PAMBuoy: what offshore developers and regulators have been waiting for**
Andy Maginnis, Senior Systems Engineer, Marine Instrumentation Ltd

PAMBuoy™ has been developed as a passive acoustic tool specifically to help monitor and mitigate the impacts of manmade noise on the oceans. PAMBuoy™ can simultaneously detect multiple species, including porpoise, dolphin and beluga whale while taking calibrated noise measurements. It accomplishes its real time feed by processing the acoustic data on the unit, reducing the data to send to shore by up to 80,000x. To date it has successfully been deployed in the UK, Denmark, USA and China, as well as mitigating the effects of noise generated during the construction of the new Forth Road Bridge Crossing.

The Key Learnings from this session:
- Understand the capability of PAMBuoy™ and why it is unique
- Past deployment scenarios and how they may apply to you
- New capability and integration possibilities

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Thursday 23 May 2013

Offshore Wind

10.45-11.15 **Gravity Based Structures Delivering The Next Generation Offshore Wind HVDC Converter Platforms**
Peter Jones, Engineering Manager for Grid Systems, ABB

11.15-11.45 **A collaborative approach to risk reduction in delivering concrete gravity foundations**
David Seaton, Operations Manager, Grontmij

This presentation will argue that the best approach to mitigate risk and improve the chances of successful design, construction and installation of concrete gravity foundations for offshore wind farms is through adopting a collaborative approach involving all project delivery partners and the extended supply chain. It will include a number of examples of how this approach has influenced the design in terms of embracing the requirements of a mass-production approach to construction and minimising time in high risk activities, particularly the offshore phase.

The Key Learnings from this session:
- Collaborative approach reduces risk
- Solution must minimise activity in high risk areas
- Early engagement with supply chain is key

11.45-12.15 **Deep water offshore wind and the hydrogen economy: the alternative to costly grid enhancement**
Andrew R.Gizara, Founder and Chief Engineer, Integrated Power Technology Corporation

Fleets of wind-propelled craft dragging water turbines through deep water can deliver energy much less expensively than existing or projected fixed structures. These craft attain a higher Capacity Factor due to a SCADA guiding these craft to the greatest resources. Eliminating cabling, foundations, permitting and other regulatory costs, along with reduced maintenance and operations costs due to central site assembly line (as opposed to hazardous field) service procedures over the long term pays for these craft themselves. Cost-effective storage affords unlimited scalability, grid feed-in baseload and load-balancing functionality. Results from hydrogen and ammonia storage models are cited.

The Key Learnings from this session:
- Wind-propelled craft dragging water turbines through deep water can deliver energy much less expensively than existing or projected fixed structures
- Higher Capacity Factor pays for storage inefficiency, from turbine to grid feed-in
- North Atlantic operation models including storage show favourable margin and LCOE

12.15-12.45 **Design, manufacture and operation of hybrid renewable energy systems**
David Sharman, Managing Director, Ampair

In recent years Ampair have been designing and manufacturing a range of standardised adaptable hybrid renewable energy systems to power autonomous vital equipment at unattended off-grid locations. Ampair's systems typically satisfy missions of between 800kWh/year and 16,000kWh/year for powering loads such as scientific instrumentation or telecoms systems. Depending on the mission requirements the systems include wind turbines, solar panels, fuel cells, batteries and can be integrated with fossil-fuelled sources such as diesel or propane generators. The systems are available in a range of form factors to suit deployment context, e.g. DNV offshore containers, road trailers, or high-mobility pods. In this presentation Ampair will discuss the lessons they have learnt over the last few years including demonstrating the in-house developed proprietary proAmpair software package that can model whether or not a given system is suitable to satisfy the anticipated mission needs prior to detailed design. Hybrid systems such as these are in daily use worldwide on a commercial and unsubsidised basis, at both onshore and offshore locations.

The Key Learnings from this session:
- The importance of professional system sizing
- The advantages of a mixture of renewable sources
- Professionalism at small scale is more difficult than at large scale

12.45-13.45 **Break**

13.45-14.15 **Combined power quality and condition monitoring of offshore HV cable networks**
Allan Brisbane, Business Development Consultant, High Voltage Partial Discharge Ltd (HVPD)

The presentation will cover an overview of offshore high voltage network monitoring system (OHVMS) for MV and HV cable networks. The anticipated result of the system implementation is to help drive down presently (very high) operational and maintenance (O&M) costs of offshore wind farms. The presentation will also include an introduction to on-line partial discharge measuring techniques and a case study of a project involving PD diagnostic testing on a 33kV land-sea export cable to a UK offshore wind farm.

The Key Learnings from this session:
- A proposal for a 'Holistic' Subsea HV Cable Network Condition Monitoring System
- An introduction to the On-line Partial Discharge (OLPD) Sensing Techniques and Measurement Systems
- A presentation of a case study: OLPD Cable Testing, Location, Monitoring with Preventative Maintenance on a 33kV Land-Sea Wind Farm Export Cable

14.15-14.45 **Water electrolysis and renewable energy systems**
Dr. Dan Carter, Manager, Fuel Cell Today

Water electrolysis can benefit both the supply-side and demand-side of the grid. On the supply-side electrolysers can store the variable output of intermittent renewable energy sources, such as wind and solar, and on the demand-side the rapid response of electrolysers supports load shedding and can ensure grid stability. These benefits allow for increased penetration of renewables into the energy mix in a more stable and predictable manner contributing to overall decarbonisation. Once produced, the hydrogen can be used directly as a chemical feedstock or transport fuel, or it can be stored (e.g. in the natural gas grid) for use when required.

The Key Learnings from this session:
- Energy storage is vital to facilitating the integration of renewables into the grid
- Hydrogen as an energy store can bridge across the electricity, heat and transport fuel silos
- Electrolysis facilitates decarbonisation of the transport, electricity and heat sectors

14.45-15.15 **TRANSFORMER PROTECTOR technology and its applications for offshore projects**
Anastasia Valicon, Northern Europe Area Manager, Sergi France

Transformers are considered by Corporate Risk Managers and Insurers as the most critical equipment inside plants because of the large quantity of oil in contact with high voltage elements. During a transformer short-circuit, the TRANSFORMER PROTECTOR (TP) is activated within milliseconds by the first dynamic pressure peak of the shock wave, avoiding transformer explosions before static pressure increases. The TRANSFORMER PROTECTOR is a concept that can be applied to all oil-filled transformers up to 1 000 MVA and larger.

The Key Learnings from this session:
- Sergi research program in brief
- TRANSFORMER PROTECTOR standard configuration
- Financial Benefits and offshore applications