

IPF BY THE NUMBERS

 1500 Attendees	 154 Speakers	 137 International Exhibitors	 52 Sponsors	 15 Countries
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2022 INTERNATIONAL OFFSHORE WIND PARTNERING FORUM

APRIL 26 – 28, 2022

ATLANTIC CITY, NEW JERSEY

The International Partnering Forum (IPF) is the premier offshore wind energy conference in North America. Hosted by the Business Network for Offshore Wind, this three-day event connects global leaders and businesses in the supply chain, offers unparalleled networking opportunities, and delivers breaking updates on the industry, from technology to policy.

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OWI-Lab presenteert keynote-speech en poster op IPF

20 april 2022, 02:00

Pieter Jan Jordaens

Naast chocolade en bier is ook onze expertise en ervaring in windenergie op zee een Belgisch exportproduct geworden, dat wereldwijde faam geniet. Dit mag nog maar eens blijken tijdens het International Offshore Wind Partnering Forum (IPF), het voornaamste congres rond offshore windenergie in Noord-Amerika, dat plaatsvindt van 26 tot 28 april. Sirris zal er als coördinator van OWI-Lab een keynote-presentatie verzorgen op deze industrie bijeenkomst.

Het IPF, een organisatie van het Business Network for Offshore Wind die plaatsvindt in Atlantic City (New Jersey, VSA), verbindt wereldleiders en -bedrijven in de toevoerketen, biedt unieke kansen tot netwerking en biedt de laatste en meest relevante updates uit de sector, van technologie en beleid tot veiligheid en situering. Het congres kan rekenen op zo'n 1.500 aanwezigen van over de hele wereld, 154 sprekers en een vakbeurs met 137 internationale exposanten.

Aanwezigheid OWI-Lab

Gezien de snelle uitbreiding van windenergie, wordt ook de relevantie van dergelijke events steeds groter. De Belgische aanwezigheid is dan ook betekenisvol. Sirris zal er als coördinator van OWI-Lab op 27 april (13:15-14:15 plaatselijke tijd) samen met Belgische bedrijven [24SEA](#), [Marlinks](#) en

[Jan De Nul](#), en in samenwerking met de Blauwe Cluster een keynote-presentatie verzorgen over de ervaring van 12 jaar R&D-campagnes en innovatieprojecten in offshore wind: 'Cost Reduction and Lifetime Extension for Foundations and Cables'. Hierin zullen topics aan bod komen als het belang van een grondig begrip van geotechnische parameters en van digitalisatie (via monitoring) om CAPEX- en OPEX-kosten verbonden met funderingen en kabels te reduceren. Daarnaast delen we ook leassons learned van meer dan tien jaar onderzoek in structural health monitoring (SHM) van verschillende offshore structuren, de verbindingstypes en lopende onderzoeken opgezet via de Blauwe Cluster zoals het [Boptic](#)- en [Soiltwin](#)-project.

Ten slotte werd ook de inzending van Sirris voor de posterpresentatie goedgekeurd: onze poster rond testinfrastructuur van de grote klimaatkamer en de inzet daarvan voor het testen van extreme weersverschijnselen op windturbinemachineonderdelen zal op 27 april (16:30-17:30 plaatselijke tijd) worden voorgesteld.

Wind turbines are more frequently installed in remote areas, where often profitable wind conditions makes such sites attractive to implement wind farms. On the other hand, such locations sometimes must deal with extreme harsh climatic weather conditions: extreme cold (-45° C onshore, and -20° C offshore) or hot temperatures (+50° C), strong winds and gusts, high humidity, snow atmospheric or splash icing conditions, hail or salty conditions depending on the site.



In cold climate markets for example, wind turbines need to be capable of operating below -30° C and need to be capable of surviving -40° C which is challenging for the machine and its components but also for inspection and maintenance works. Some repair actions even need to be postponed due to safety during harsh weather conditions and thereby affect the turbine availability and business case.

OEM's and component suppliers develop specific cold, hot and offshore climate packages to increase the performance, reliability and robustness of the turbine. Dedicated cold-start procedures, the use of other materials, lubrication or dielectric fluids and all kind of monitoring and mitigation solutions when dealing with icing are developed nowadays. In order to learn and validate how these harsh environment packages operate and perform in real-life conditions a large climate chamber test facility was set-up in Belgium (Antwerp).



The facility and its associated test and R&D-projects have specific attention to cold climate testing and offshore high humidity and temperature cycling testing. Additional test benches for cold start testing of gearboxes, the testing of transformers and a large-scale icing array were added as additional features to the large climate chamber to fulfil specific industry needs.

Climate chamber tests at full system level, specifically cold start and cooling tests are considered by product design and validation engineers to ensure the required performance and reliability levels of their designs during operational and survival conditions. Also for certification purpose (IEC 60068-2-1 for example) specific prototype system validation tests are mandatory or recommended to ensure reliable and save operations during extreme climatic events.

Specific attention goes to low temperature cold start-up behaviour of drive-trains and pitch & yaw solutions and it's lubrication performance, the same driver can be found in the testing of liquid filled transformers and the performance validation of (new) di-electric tank fluids. Challenges with respect to rotor icing, nacelle cooler icing and ice blockage of emergency escape doors are also of importance for certain sites.

Most test procedures or functional validation tests can only be executed when the climate chamber is combined with mechanical and/or electrical test equipment to reproduce a representative testing environment such as a black start event (cold-start). As alternative to expensive wind tunnel testing a large scale icing array can be used for some pre-tests related to atmospheric and splash icing topics.

Methods

In 2010 a large climate chamber was built-up in Belgium by Sirris to support the design validation testing of large and heavy wind turbine components up to 150 ton. The climate chamber was foreseen with the ability to recreate -60° C to +60° C climatic environments in a 10,6 x 7 x 8 meters (LxWxH) test room. In order to perform real scale system testing of drivetrains to evaluate grid failure events and cold start-up performance (measuring the break-away torques, warm-up times and the functioning of lubrication units) a no-load test rig for cold start tests was also developed to functionally test gearboxes (and drivetrain assemblies) during extreme cold climate events.



In order to test liquid filled transformers for cold start functioning, a multi-MW electrical test concept was built in the same climate chamber.



Recently a new feature, a large scale icing test array, was added that will be used to evaluate (new) anti-ice coatings, ice detection and de-icing strategies as alternative to expensive climatic wind tunnels testing. Certain development and validation tests can be performed at first with such set-up before advanced climatic wind tunnel testing are considered.



Results

Lessons learned from more than 100 validation test campaigns in (extreme) harsh conditions in the climatic test facility of Sirris has learned us that the failure of small parts or components such as lubrication pumps, valves, heaters or even sensors which are tested as individual parts can still cause unforeseen failures when used in a full system testing approach and cause downtime of the full turbine.



Most component suppliers and OEM's know the added value of full system testing and they put effort in developing dedicated climate packages to overcome the challenges during harsh weather conditions. With more wind energy farms planned in remote sites and harsh weather conditions, and the increasing frequency of extreme weather events (during winter and summer), there is a need from industry to test machines at real scale in those challenging environments to prove the performance and reliability of the equipment, either for certification purpose and for risk mitigation.

References

<https://www.oel-lab.be/large-climate-test-chamber-services>

NEN-EN-IEC 60068-2-1 (cold)

DNVGL-RP-0363 - Extreme temperature conditions for wind turbines

Auteurs



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