

Germanischer Lloyd beaufort 6

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The GL Wind Newsletter for Customers and Business Partners

IN DEMAND Condition Monitoring Systems SPECIAL Research Platform FINO 1



Location: Amrumbank West

The first offshore measurement mast in the North Sea has now been certified.

When, over the next few years, the first wind turbines off the German coast come online, the Amrumbank West site will play a very special role: about 35 km west of Amrum Island, the company Amrumbank West GmbH plans to erect 80 wind turbines. In addition, the firm "WINKRA Offshore Nordsee Planungs- und Betriebsgesellschaft" is also preparing a project with 80 units some three kilometres farther south. WINKRA is a subsidiary of Essent, a Netherlands utility, while E.ON Energy Projects GmbH holds a major interest in Amrumbank West GmbH.

AN IMPORTANT STEP towards realizing these ambitious offshore goals was taken in April 2005 with the installation of a measurement mast as a joint venture by both operators of the future wind farms. Equipped with an impressive array of measuring devices, this mast is designed for wind speeds ranging up to 180 kilometres an hour as well as a maximum wave height of 19 metres. Its tip is located 90 metres above sea level.

In the meantime, Germanischer Lloyd WindEnergie GmbH (GL Wind) has issued the certificate for the measurement mast to the farm operators. One element of the certification was site analysis and design assessment, which concentrated mainly on the installation's structural integrity over the envisaged lifetime of five years.

CERTIFICATION COVERED the entire support structure, consisting of the lattice tower, transition piece, platform, measurement container and monopile foundation. The work was carried out by a consortium under the lead management of Hochtief Construction AG. Production was supervised by GL Wind at the various manufacturing facilities. Commissioning was followed by final acceptance, including an underwater survey by divers and an ROV (remotely operated vehicle). The Amrumbank West measurement mast is thus the first private sector installation of its kind in the North Sea. Since being commissioned, the met mast has supplied the required wind and hydrographic data, together with stress measurements. This information will be used for energy yield prediction, for determining and calibrating the site conditions, and also for studying the stress in the monopile.

Dear Readers,

A lot of money will be invested in offshore wind turbines over the next few years. With its "Guideline for the Certification of Offshore Wind Turbines", GL Wind has provided a unique foundation to ensure that these sums are well invested. It creates the technical

design prerequisites for realizing, at long last, the first offshore wind farm in Germany. In this Guideline, we have made it clear that offshore wind turbines are not just on-shore

installations on stilts. For example, their design must consider the harsh site conditions: the stronger winds, the water loads and the corrosive environment. Another factor that should not be neglected is ship traffic. Whereas a land turbine is constructed for maximum stability, its counterpart at sea should be more yielding – just in case a cargo ship sails off course. As one of the load cases, the Guideline also includes a possible ship collision with a supply vessel. The new Offshore Guideline extends to over 400 pages, weighs almost two kilograms and, above all, integrates all our experience from many and varied research projects, such the North Sea platform FINO 1, which is surely a jewel amongst the German research facilities. On pages 3 to 6 of this newsletter, we give you a detailed presentation of FINO 1.

Yours sincerely,

Bodo Helm
Managing Director, GL Wind



Bodo Helm

Sensors of the Future

Not only is the certification of condition monitoring systems greatly in demand nowadays, it also pays off, because many underwriters reward holders of the certificate with better insurance terms.

With a quality-oriented examination of the external and internal state of a wind turbine, the so-called condition monitoring systems (CMS) are gaining steadily in significance. With the aid of these systems, fluctuations and changes in the parts and components of wind turbines that represent significant deviations from normal operation can be detected and corrected in good time. If the condition monitoring system is reliable, this reduces more than just the costs of operating the turbine: operators whose installations are equipped with a CMS certified by GL Wind may receive more favourable terms from their insurers.

WITH ITS "GUIDELINE for the Certification of Condition Monitoring Systems for Wind Turbines" published in 2003, GL Wind has defined the standard for safety worldwide. Since the introduction of this Guideline, eight condition monitoring systems and two monitoring bodies have been certified. Further systems and monitoring bodies are currently being examined.

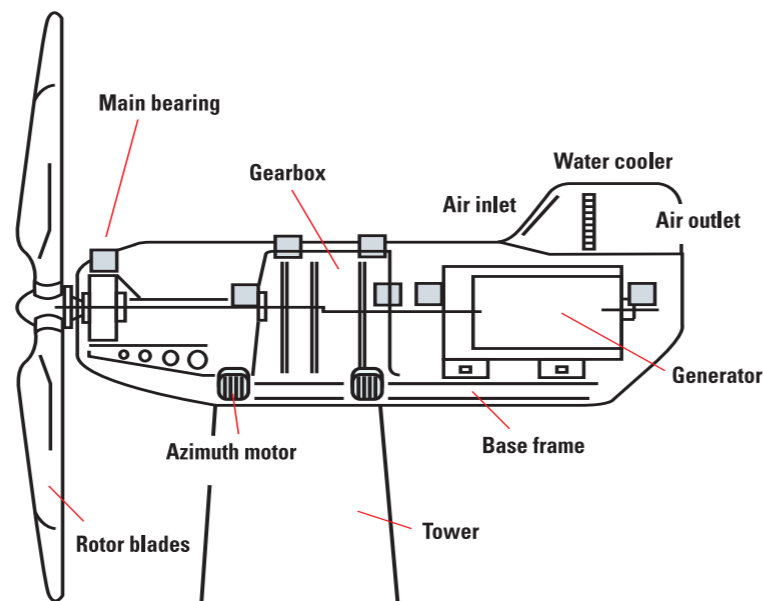
In condition monitoring, sensors placed at the main bearing, gearbox and generator measure the vibration occurring both inside and on the surface of these parts; a special software package analyses these measurement values for deviations from the norm, which then trigger an alarm message. On the basis of their data analysis, the monitoring experts draw up competent recommendations for action as soon as possible, so that the site manager can be informed immediately. Thanks to condition monitoring systems, damage to the roller bearings or the gears can be recognized at an early stage, thus warding off the follow-on damage which would otherwise pose a great risk. In addition, the CMS registers a wide range of operating parameters, such as wind direction, the temperatures of the outside air, nacelle, bearings, generator windings and oil, the oil pressure and also messages on control actions, e.g. those issued by an active yaw system.

ON PRINCIPLE, CMS certification is a complex process: after a thorough examination of the documents and the computer program, the CMS is subjected to an acceptance inspection by the GL Wind experts, both at the works of the CMS manufacturer and at the site of the wind turbine. Amongst other things, this involves checking that

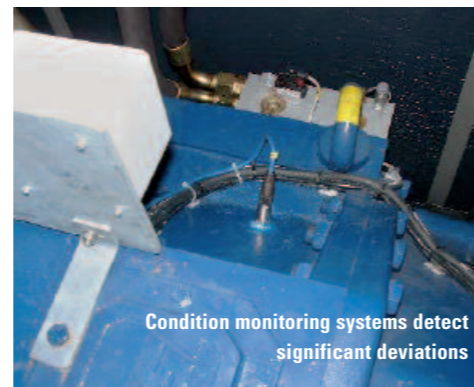
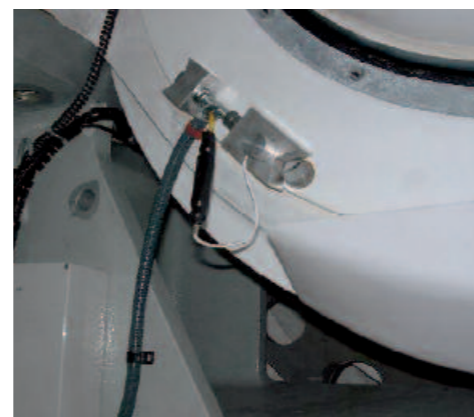
- at least the main bearing, main gearbox,

generator and the tower are monitored by the CMS;

- the relevant operating parameters such as speed, output and temperatures are recorded;
- the measurement values relating to a special state are separated from those due to normal operation;
- data that are of significance for the interpretation cannot be lost;
- transgressions of the limit values are automatically and immediately transmitted by the CMS to the monitoring centre with pre-alarm and main alarm;
- the use of the CMS is also possible under extreme site conditions (e.g. offshore).



THE CMS certificate issued by GL Wind has a validity period of two years, after which recertification is necessary. For the monitoring body, the certificate is valid for five years; however, an audit is performed every two and



a half years, during which the monitoring centre is examined to ensure whether it still functions according to working procedures stipulated in the certification.

PRESENTATION OF THE CERTIFICATE

Turbine Condition Monitoring System Certified

The monitoring of turbine components in respect of condition-oriented maintenance is becoming more and more important: Axel Juhl (Managing Director, Gram & Juhl), Klaus Gram (Managing Director,

Gram & Juhl), Bodo Helm (Managing Director, GL Wind) and Torsten Muuss (Project Manager for Condition Monitoring at GL Wind) at the presentation of the type certificate for the condition monitoring system "Turbine Condition Monitoring (TCM)" of the Danish manufacturer Gram & Juhl. The handing-over ceremony took place on 22 September at the HUSUMwind trade fair.

CURRENT RESULTS

FINO 1 – A Finger in the Wind

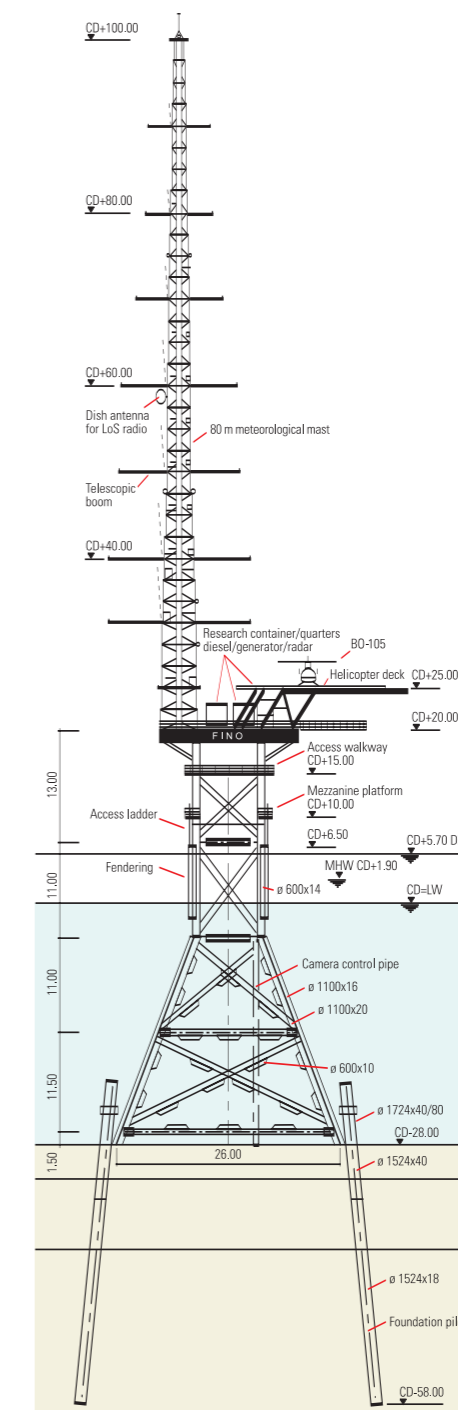
The opportunities offered by wind energy undoubtedly lie offshore. But where exactly? And how must the wind turbines be constructed for operation at sea? FINO 1 represents a decisive step towards answering these questions.

FINO, which stands for "research platform in the North Sea", has been supplying measurement results without interruption since September 2003 and is a veritable jewel amongst the German research facilities. "With the aid of this platform, we can indeed find out – for the first time ever – the behaviour of the winds blowing over the North Sea and just how much energy can be harvested from them," explains Kimon Argyriadis. "And we really need such data for the planning, approval and design of future offshore wind turbines."

KIMON ARGYRIADIS IS AN ENGINEER at GL Wind and recently presented important measurement results to experts attending the firm's offshore conference. Thus far, the data from two winters and a summer have been analysed, although this is too little for the statisticians to draw up an exact wind potential analysis. Nevertheless, certain trends may be discerned. For example, wind speeds of over 9 metres per second were measured as the annual average – which indicates a good site for a wind farm. A major question for Argyriadis as a certification specialist is whether the FINO data lie within or near the limits prescribed by the offshore guidelines of GL Wind: a high correlation of wind speed and wave height, together with adequate knowledge of both parameters, is needed to design a turbine for reliable operation at sea. Five characteristic storm events were soon selected and analysed, also with regard to the expected turbulences.

"IT'S LOOKING VERY GOOD for us," Argyriadis sums up, "because we are on the safe side with our certification guideline, also as far as the FINO site is concerned." However, a long-term analysis of the data is still needed to obtain conclusive results. A noteworthy aspect for the GL experts was that the wind and wave directions are able to exhibit considerable differences, a circumstance that must certainly be taken into account in dimensioning the turbines of tomorrow. The bottom line: the more data available, the better it will be for the wind energy industry. As a result, it is conceivable that the FINO measurement programme will be prolonged for a period of ten years.

The article "Research Platform FINO 1 – Some Results" (in German) by Kimon Argyriadis may be downloaded from www.fino-offshore.de by navigating to the item "Results > Meteoroloav".



The Project

The research platform FINO 1 is being funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), represented by the Jülich Research Centre (Project Management Organization Jülich, PTJ). Germanischer Lloyd WindEnergie GmbH has been entrusted with coordination of the construction, erection and commissioning as well as the operation of the platform. Extensive physical, hydrological, chemical and biological measurements are being performed at the research platform. The measurement data and results will yield important findings for the approving authorities as well as for the operators of offshore wind turbines.

The results of the measurements and studies will be published at www.fino-offshore.de on a regular basis.

The Site

The research platform FINO 1 is situated about 45 kilometres north of Borkum Island in water about 30 metres deep (Borkum Riff, coordinates N 54° 0.86' E 6° 35.26'). For the adjacent area, the Federal Maritime and Hydrographic Agency (BSH) approved the construction of the first offshore wind farm in November 2001. Twelve individual wind turbines are to be erected here as part of a pilot phase. In addition, the "Foundation of German Industry for the Utilization of and Research into Wind Energy at Sea" (Offshore Foundation) plans to construct an offshore test field in the immediate vicinity of FINO, with the aim of moving the expansion of wind energy in the German North and Baltic Seas forward at long last. Here a special objective is to advance the technology for wind turbines of the five-megawatt class. The players in the establishment of the Offshore Foundation include the turbine manufacturers Enercon, Multibrud and REpower, the energy utilities E.ON, EWE and Vattenfall, various companies of the maritime industry, wind energy associations, banks, underwriters, construction firms and GL Wind.

Concierge at a Height of 100 Metres

Presenting a graduate oceanographer who has worked for three and half years at WINDTEST Kaiser-Wilhelm-Koog GmbH and is now practically the caretaker for FINO 1: Detlef Kindler.

A motor launch needs all of six to eight hours to reach FINO 1 – too long for effective working conditions. So it comes as no surprise that Detlef Kindler regularly has to catch a helicopter to his place of work. Visibility permitting, the trip then only takes 35 minutes. If the day turns out foggy, Kindler sometimes has to sit at Wilhelms-haven airport from six to ten o'clock in the morning, waiting together with the two pilots for take-off clearance. Every so often, he is accompanied by journalists or staff from the institutes conducting the measurement campaigns on the platform. As soon as the helicopter has dropped the crew on the FINO landing pad and flown on, Detlef Kindler struggles out of his bright orange survival suit and gets down to work.

GL Wind is responsible for all operational activities on FINO, and to this end is supported by its measurement institute WINDTEST Kaiser-Wilhelm-Koog GmbH – a 70 per cent subsidiary of GL Wind. Vertical radar, horizontal radar, navigation lights, continuous-

duty generator, back-up generator, a tank holding ten cubic metres of fuel – all this and much more awaits regular and thorough checks, and Kindler is often called the "caretaker", because he is the one who carries out these tests with meticulous care. In addition, he is also responsible for looking after and instructing all persons who come onto the platform – be they visitors, technicians or scientists.

So he is really an academic concierge who is as familiar with wind speed, wind direction, air temperature, air pressure, air humidity, air density, precipitation level, global irradiance, UV irradiation and the frequency of lightning strikes as with the current trends in wind energy technology.

BOREDOM IS AN UNKNOWN WORD for Kindler, because there is always something new going on. In the near future, "light detection and ranging" (lidar), a method related to radar ("radio detection and ranging") for the exact measurement of atmospheric parameters, will be tested in the field of offshore wind

energy for the first time – on FINO. Lidar is a remarkable innovation in measurement technology, because a lidar unit – assuming it will be able to measure both wind speed and wind direction with the same accuracy as conventional cup anemometers and wind vanes – will practically replace the costly wind measurement masts. At regular intervals, Kindler climbs up onto the measurement mast to check the sensors or exchange them. Chained to a sliding safety hook, he ascends to windy heights, where he likes to take a breathtaking look over the wide expanses of the North Sea – a view enjoyed by few.

WHAT DOES THE WORLD feel like at 100 metres? Being halfway between heaven and earth is a very special sensation. Strangely enough, one does not notice the height on the mast all that much, because there are no hous-



Detlef Kindler

es or other points of reference. The horizon is the dominant feature, with the platform below looking rather like a postage stamp on a football field. "The platform," says Kindler, "has a diameter of 16 metres, and you are 80 metres above it. To put it another way, think of five times the diameter of the platform – that's your relative height above the platform. A peculiar feeling."

Although FINO is a remote base for unmanned wind measurement, it does offer some creature comforts: a small kitchen with a hotplate and a few tins of soup, and even a sanitary container. Detlef Kindler only finds it problematic when the cloud cover draws closer in the afternoon and the foghorns start up. Or when sleet comes down in winter and the weather is classed as unflyable. Until now, he has always been able to leave the platform with the helicopter, but one day his luck will run out, meaning an overnight stay; two beds have been provided for that eventuality. This could prove to be a bizarre experience, in view of the extreme wind speeds and wave heights that have been measured to date. The current record was noted on 8 January 2005, with the wind howling over FINO at a speed of 41.7 m/s (150 km/h). And wherever there is wind, the waves are not far behind. The maximum wave height on this day was an incredible 10.37 m. "Will it be possible to stand upright?" the concierge asks as a rhetorical question and thinks back to the waves of over four and half metres he has already experienced on the platform. On that occasion, he was given a rough shaking. But all that is all part of the job, just like the wind is needed for harvesting energy from nature.

PHOTOS: CHRISTOPH EDELHOFF, GRAPHIC: BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Whipping up a Storm

Wind speed, sea state, currents, wave height and lightning strikes: the sensitive instruments on FINO 1 register every movement and deliver valuable data for research.

To determine the meteorological parameters, an 80-metre wind measurement mast was erected on the platform. Since the platform itself is 20 metres above sea level, the maximum measurement height is 100 metres above chart datum (CD). FINO therefore has the world's highest location for permanent offshore wind measurement. Cup anemometers have been installed on the south-east side of the platform to record the wind speeds at eight different heights (33.5 to 100 m). In addition, wind vanes are mounted at heights of 33.5, 50, 70 and 90 metres on the north-west side of the mast to establish the wind direction, augmented by ultrasonic anemometers at 40, 60 and 80 metres. These devices not only measure the turbulence of wind flow but, using a 3D wind vector, can also ascertain the horizontal and vertical components, and hence the wind direction. Further sensors are provided at various heights for the standard meteorological parameters, such as temperature and humidity. Time series data are logged for most of these quantities.

THE SENSORS ARE REMOTE-CONTROLLED from land and the data are sent directly to the corresponding institutes by radio link. The

technical measurements are being carried out by the German Wind Energy Institute (DEWI) in cooperation with the Federal Maritime and Hydrographic Agency (BSH). Diverse hydrological parameters are also measured at the platform, for example:

- Water level
- Water currents (speed and direction at various water depths)
- Swell
- Water layers, water temperature, oxygen content, salt content

These measurements are intended to provide information on the current and wave loads which must be expected for future offshore wind farms. In addition, the data will supply further indications of the hydrographic conditions prevailing in the German Bight.

LIGHTNING STRIKES REPRESENT a potential risk for offshore wind turbines: early in 2005, lightning counters were therefore installed on FINO to register the number of strikes. Whilst the frequency of offshore thunderstorms is classed as being lower than on land, an increased number of lightning strikes to exposed offshore structures cannot be ruled out. Another study is focusing on the local water-current field for a period of twelve months. The data acquired here will yield insights into the influence exerted by the local flow field, serving as input data and to validate small-scale models. In addition, it will be possible to investigate the scouring processes at the foundations of offshore structures.

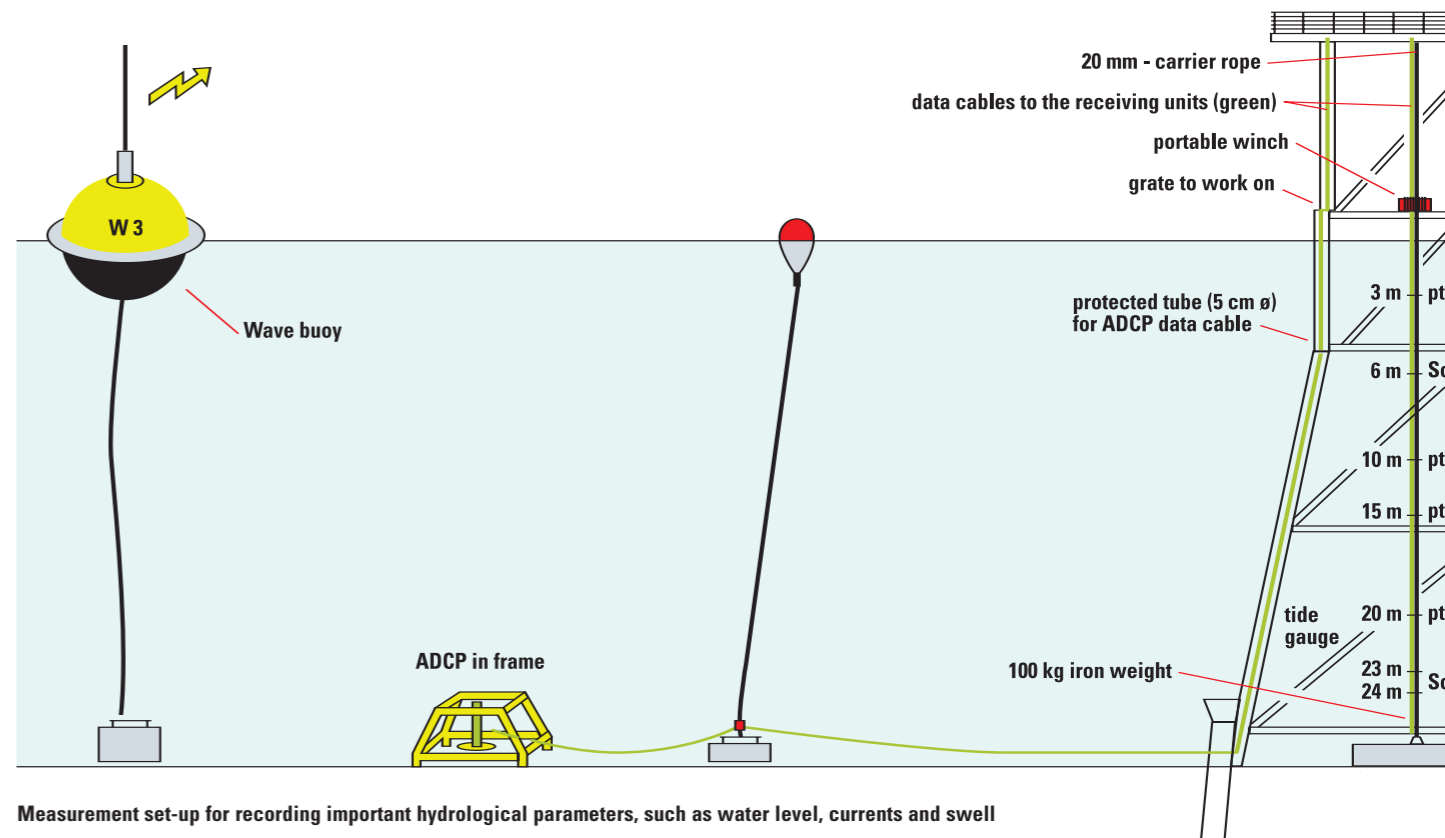
For this task, four ADCPs (acoustic Doppler current profilers) in special underwater frames are deposited at defined distances on the seabed around the platform. Several measuring cycles with different distances from the platform are planned. A decisive factor for the arrangement of the four devices to each other is the main current flow, driven by the tides, in the east-west and west-east directions. The measurement programme is being conducted by the Federal Maritime and Hydrographic Agency (BSH) in Hamburg.



Biological measurements



The ladder to success



Measurement set-up for recording important hydrological parameters, such as water level, currents and swell



CONCURRENT BIOLOGICAL RESEARCH

Protecting the Marine Fauna

What effects do wind turbines have on fishes, birds and marine mammals? To find answers, concurrent biological research is being undertaken on a broad basis at FINO. Here the focus is on an ambitious bird migration project and also on another concerning the development of life on the seabed.

BIRD MIGRATION Are wind turbines really the terrible "bird blenders", as their opponents like to call them? There is no doubt that birds can collide with marine platforms and other obstacles, especially when visibility is poor. Since bird migration is a phenomenon that only occurs at certain times, further studies on the migration intensity are urgently needed. However, the migration height is also of importance if the delicate relationship between turbines and birds is to be defined with greater precision – but practically no data are available for this parameter at present. To throw some light onto the matter, two ship radar units have been installed on FINO: whilst a horizontally oriented unit gathers data on flying speed and direction, a vertical radar records the migration intensity and height distribution. Additional units have been set up to analyse the species spectrum. A video camera is used during the day, a thermal imaging unit at night. Right around the clock, directional microphones continuously record the sounds of birds and the sonar

noises of bats. All these data and images are first stored on the platform, and then downloaded via a radio link for later analysis by the biologists participating in the project. It has been found that the navigation lighting of the platform presents a significant risk to birds, because they are attracted by the lights. To reduce the danger for birds, the ornithologists are considering an adaptive lighting concept or the alternative of switching off the lights during nights of mass migration. For further information:

www.vogelwarte-helgoland.de

MARINE ENVIRONMENT Biologists characterize the seabed as a soft-bottom ecology that is subjected to substantial changes through the support pillars of wind turbines. To determine the extent of these changes, a novel underwater photo/video system was installed at FINO. This system is remote-controlled from Bremerhaven by staff of the Alfred Wegener Institute for Polar and Marine Research (AWI) via a radio relay link. Since the end of

Further Info on the Internet

Everything about FINO at www.fino-offshore.de: the website presents a wealth of general information on the topic of offshore wind energy and about the Renewable Energy Sources Law (EEG), with overview maps on the planned wind farms in the North and Baltic Seas, rounded off by news updates. For example, a day graphic shows the measurement values for the last 24 hours – in particular the wind speed, maximum and significant wave heights, wind and wave directions, wave period, air and water temperatures, and air pressure. Besides the current weekly values, the website also offers analyses by month and year.

Information on the latest developments are to be found in the FINO newsletter. Subscriptions can be taken out either at the website or by contacting Germanischer Lloyd WindEnergie GmbH, Gundula Fischer, Steinhöft 9, 20459 Hamburg, Phone +49 40 31106-1145, Fax +49 40 31106-1720

Webcams on FINO 1

If you would like to know how calm or how stormy the North Sea is at the moment, visit www.fino-offshore.de (under the menu item "Research Platforms"). Three webcams are mounted on FINO to supply up-to-date images 24 hours a day.

- Webcam 1 is pointed in a north-westerly direction to the open sea.
- Webcam 2 looks northward over the helicopter pad.
- Webcam 3 covers the container buildings on the platform.

The latest measurement data are provided for wind speed, wind direction and temperature – each at heights of 40, 60 and 80 metres. The datafeed is refreshed every ten minutes.

August 2003, it has been possible to document both the new population and the development of marine life at one of the FINO pillars. In general, a shift in the fauna composition has been observed: scavengers benefit from the massive growth on the jacket structure, some of which tends to fall down, so that starfish, crabs and species like cod are attracted to this environment. For just a single installation, this would not represent an appreciable change in the marine fauna, says Dr Alexander Schroeder of AWI, but a few hundred or thousand turbines would certainly make a difference. For further information: www.awi-bremerhaven.de

EXPERT INTERVIEW

Never Short of Wind

Talking to Christian Nath, Managing Director of Germanischer Lloyd WindEnergie GmbH

In September 2005, he celebrated his 25th anniversary of service: for many years, Christian Nath was responsible at Germanischer Lloyd for testing and research in the field of wind turbines; with the establishment of Germanischer Lloyd

commissioned to assess the installation, some of the components had already been completed, i.e. design changes would hardly have been possible. The wind speed assumption turned out to be problematic, as did the setting of the brakes and the unstoppable desire



Meeting at the HUSUMwind: Peter Harry Carstensen, Governor of Schleswig-Holstein, and Christian Nath

WindEnergie GmbH in the year 2000, he became its Managing Director. Reason aplenty for beaufort 6 to talk to this leading champion of wind energy.

BEAUFORT 6: How did you come to have an interest in wind power, and what do you find so fascinating about this particular force of nature?

CHRISTIAN NATH: As a young engineer, I was employed in research at Germanischer Lloyd and assessed a wide range of components for projects ranging from the Krümmel nuclear power station to the GROWIAN wind energy converter through concomitant calculations. The wind turbines of that time impressed me by their sheer size. At that stage, I thought less about the natural force aspect than the structural design of all plants being examined by Germanischer Lloyd.

Do you have fond memories or rather mixed feelings when you think back to the GROWIAN project in Kaiser-Wilhelm-Koog?

GROWIAN was really an enormous project for its time and represented a force-fed political goal. When Germanischer Lloyd was

to achieve 100 metres for the hub height and diameter.

Many anecdotes about GROWIAN are still circulating today. Do you have a personal favourite?

Well, apart from the sad "performance figure" of one tonne of weight per running hour (500 t for 500 h in operation), there is the story about the pipe-smoking GL inspector who, when the yaw control suddenly cut out, had the pipe torn out of his mouth!

Between 1990 and 1992, you were involved in setting up the Saihantala test field in the People's Republic of China. That sounds like an exciting adventure seasoned with hard work.

Our China project had a bit of both. Our Chinese hosts made every effort to make my family and me feel at home. This ranged from luxury hotels to guest houses which could have done with some of the proverbial Chinese cleanliness. And when you live with two blonde daughters, aged eight and ten

years old, in a Chinese city of 300,000 souls in which there are only twelve "long noses", you do feel like an adventurer. The hard work certainly began with the installation of equipment on the 60-metre measurement mast and with other technical tasks – a talent for improvisation was always needed.

Opponents of wind energy often bring up the so-called aesthetic argument: these installations are a terrible eyesore and spoil the landscape. What do you say to that?

In the grand old tradition of Germanischer Lloyd, I say: "it all depends". There are plants that I find very pleasing to look at, because their graceful movements appeal to me. These include particularly the new large turbines – even GROWIAN looked good, when it happened to be turning. In the case of some plants, on the other hand, it would have been wiser not to have built them at all, and luckily they have disappeared again to a certain extent. Personally, I find the sight of an atomic power plant with its high-voltage lines to be quite unpleasant.

At this year's HUSUMwind fair, you were able to welcome Peter Harry Carstensen to the GL Wind stand. How does the Governor of Schleswig-Holstein see the future of wind energy?

The Governor recalled times in which he himself was an operator of wind turbines. It is his opinion that wind energy and, with it, the corresponding companies in the State of Schleswig-Holstein will continue to grow. For him, it goes without saying that the world of politics must preserve the general conditions to ensure that the wind industry remains on a firm foundation.

And what is your view? What will wind turbines look like, and where will wind energy be, in 25 years' time?

Six years ago in Husum, I presented a paper on whether three megawatts was the limit to

"In 25 years, a significant proportion of the energy mix will be provided by wind energy."

the growth of wind turbines. The conclusions made then have been rendered obsolete by today's reality: 6 MW plants will be built. Apart from growth in the size of individual installations, there will be a massive build-up in a large number of countries which do not yet have so many plants as Germany does. In 25 years, when we will be implementing the Agenda 2030, a significant proportion of the energy mix will be provided by wind energy. And here I mean more than the 6 per cent already being generated by wind in Germany today.



Retiree Dr Bernhard Richter (centre), together with Dr Hans Berg (left) and Lutz Wittenberg, the Managing Directors of Germanischer Lloyd Industrial Services

PERSONNEL NEWS

A Pioneer Leaves the Field

After obtaining his doctorate on "Examinations on the pitting corrosion of nitrogen-alloyed austenitic chrome-nickel-molybdenum steels in aqueous solutions containing chlorides", Bernhard Richter devoted several years to scientific research into corrosion at the Fraunhofer Institute for Manufacturing Technology and Applied Materials Research (IFAM) in Bremen-Lesum, after which he joined Germanischer Lloyd on 1 July 1977. Dr Richter soon beca-

me GL's specialist for the corrosion susceptibility of welded connections, discovering his love of wind energy in the process. It was with his work and the GROWIAN project in Kaiser-Wilhelm-Koog that the expert activities of Germanischer Lloyd began in the field of wind energy. During the eighties, Dr Richter then created a sound basis for the later success of GL Wind: not only through the active involvement in standardization bodies, but also through the participation in research and development projects for load models, measurement and the first guidelines. In 1984, he initiated the establishment of a test field at Kaiser-Wilhelm-Koog and, a year later, the systematic expert appraisal of wind turbines in Germany in accordance with the building regulations and the first certifications of Danish plants. In 1989, he actively promoted the founding of WINDTEST Kaiser-Wilhelm-Koog GmbH with participation of the federal state, the district, the municipality and the then power utility Schleswig. In January 2002, Bernhard Richter became head of the new operating area "Industrial Services" with operational responsibility for oil & gas, certification, wind energy, testing laboratories and civil engineering/fire protection. Only a

Dates

NOVEMBER

02–05.11.2005, Melbourne

4th World Wind Energy Conference & Renewable Energy Exhibition

Andreas Anders will be speaking on 3 November at 11.20 a.m. on "Type and project certification for wind turbines", and Silke Schwartz on 4 November at 4.00 p.m. on "Determination of actual fatigue loading on wind turbines based on neural networks".
www.wvec2005.com/program.shtml

15–16.11.2005, Grevenbroich

6th Expert Conference WINDTECH 2005 Wind Energy – Technical and Economic Outlook

Organizers: WINDTEST Grevenbroich GmbH, International Economic Platform for Renewable Energies (IWR), NRW State Initiative on Future Energies

Registration: Natalie Lenz, windtech@iwr.de
www.windtech.de

FEBRUARY/MARCH 2006

27.02–02.03.2006, Athens

European Wind Energy Conference

Joint pavilion, Stand No. 364
www.ewec.info

few months later, he was named Director. "No gust of wind could throw him off track when he was fired up with enthusiasm for an idea. Doubts and reservations were simply blown away. He was ready to make decisions, to seize opportunities and to implement clear-cut business plans," is how Rainer Schöndube, Executive Board Member of Germanischer Lloyd, characterized Bernhard Richter at the official farewell ceremony.



Volker Köhne and Wu Gang at the signing of the contract in Husum

New Order in China

Volker Köhne, Managing Director of WINDTEST Kaiser-Wilhelm-Koog GmbH and Wu Gang, Managing Director of the Chinese firm GOLDWIND Science & Technology Co., Ltd. met at HUSUMwind to sign a contract on test measurements lasting two months at the wind farm Urumqi that was recently set up in the province of Xinjiang. "Wind energy is booming worldwide, and so it is a logical step for two internationally renowned companies like WINDTEST and GOLDWIND to become business partners," was how Volker Köhne described the new agreement.

GL Wind: About Us

Germanischer Lloyd WindEnergie GmbH is concerned with all technical questions and organizational aspects regarding safe procedures for the design, construction, commissioning, operation and the possible dismantling of wind turbines as well as their inspection and certification. GL Wind is the leading certification body in the wind energy sector. With its "Guideline for the Certification of Wind Turbines", it has set the international standard. GL Wind carries out assessments, computations and measurements, monitors the fabrication of critical parts, witnesses the commissioning, undertakes regular inspections, and issues certifications and expert

opinions. What is more, GL Wind invests significantly in wind-related research and is a leading participant in the advancement of national and international standards. With a total of 51 employees – including 43 engineers – the company is a wholly owned subsidiary of Germanischer Lloyd Industrial Services.

Personal contact: Christian Nath, Germanischer Lloyd WindEnergie GmbH, Steinhöft 9, 20459 Hamburg. Phone: +49 40 31106-707, Fax: +49 40 31106-1720, www.gl-group.com/glwind, e-mail: glwind@gl-group.com

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