

ON SERVICE

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FOCUS ON

Wind energy is a ray of hope. Or is it?

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Wind energy is a ray of hope. Or is it?



"In the past, the future also looked brighter." In view of the approximately 6,000 (!) future generations who will have to live with the legacies of the nuclear industry, this quote from the Munich comedian Karl Valentin (1882–1948) definitely contains a grain of truth. In today's energy mix, renewable energy sources provide a real ray of hope. So the question of whether wind energy presents an opportunity or a risk seems rather rhetorical. But it's not quite that simple.

Already close to the term of its office, the grand coalition decided to construct wind farms along German coastlines. According to the plans, the percentage of regenerative energy present in the total power supply will be gradually increased to 30 percent by 2020 – with wind energy playing a decisive role. A separate regional development plan for the construction of up to 30 offshore wind farms is ready to be tabled. By 2030, the output of the currently approved wind farms should be more than doubled from 12,000 to 25,000 megawatts.

New jobs will be created. But who will fill them?

In view of these plans, one should expect the “Wind Energy” success story to continue. As part of these ambitious tasks, more than two million new jobs should be created in the renewable energy sector over the next ten years. But who will take these jobs and do the actual work?

Obligation for companies?

Due to the considerable increase in offshore wind energy alone, it can be expected that the already drastic shortage of skilled workers in the Onshore Wind Energy sector will only get worse. After all, this sector employs today’s specialists that will be required for tomorrow’s ambitious offshore projects. There’s no solution in sight for this dilemma, as politicians don’t feel any obligation to consider, for example, respective offers from job agencies. This is first and foremost left up to the individual companies (Page 5).

The risk of a “skilled worker shortage” should not be underestimated, as the ambitious goals along the coast can only be realized if the required manpower is available. At the same time, a severe worker shortage in the Onshore Wind Energy sector must also be avoided if the latest repowering plans are to remain realistic.

Who is enticed by the bonus?

Since January 1, 2009, the EEG has used a repowering bonus in attempt to entice its members to replace existing plants – specifically first generation plants – with newer, more effective onshore WTGs. In addition, the locations of WTGs are to be concentrated in certain locations. The regulation, effective until the end of 2008 did not, however, provide the impetus required for an effective repowering. Whether the new bonus system will change this situation will, among oth-



A single turbine owner can improve the performance of his existing turbine as much as five times if he participates in a wind farm repowering project.

er things, depend on owners of individual WTGs and to what extent they are prepared to change their thinking (Page 7).

Who bears the responsibility?

Another problem for extension and service work on Onshore Wind Energy systems is the increasing scarcity of 600 ton* cranes. According to the firms leasing out the cranes, this is due to lighter cranes no longer being used for certain load cases following an accident 18 months ago. Crane manufacturers such as Liebherr

do, however, see the situation differently and pass on the responsibility (Page 12).

Stability in the crisis?

Apart from the complex current problems, of which only a few have been cited as examples in this issue, the Wind Energy sector does also offer real opportunities for growth. In the current financial crisis, it is one of the only industries that remains stable despite the turmoil in the financial markets. And if one considers that this crisis is not just a flash in the pan but, rather, an extensive wildfire, it can be rightly stated that the wind energy sector is by and large crisis-proof.

New heavy-weight

This is obviously a view shared by Germanischer Lloyd and Garrad Hassan who merged in August 2009 to form a new heavy-weight in the wind energy sector. “GL will clearly position itself in renewable energies”, said Volker Köhne, although the Regional Business Manager Renewables Europe at Germanischer Lloyd is also aware of the potential conflicts of interest with this new company (Page 14).

Sending out clear signals

Provided one is able to come to grips with the current and future problems in the wind energy sector, the opportunities clearly outweigh the risks. However, one prerequisite is that politicians must want to tackle the problems in conjunction with all those responsible, setting clear signals, instead of once again extending the life of nuclear power plants. Of course, the Wind Energy sector has left its pioneering days behind and must also make a contribution.

The Wind Energy sector has developed into a serious economical and industrial sector, increasingly subject to international standards. This also includes the aim of uniform designation regulations for WTGs – which promises certain advantages. The progress that has been made in this area is described on page 17. ■

Strong headwind: shortage of skilled workers intensifies.



The future is bright. If one believes the former Federal Minister for the Environment, Sigmar Gabriel, the renewable energy sector will create around two million new jobs by 2020. But adversity is looming: according to experts in the sector, there will be a lack of some 500,000 skilled workers by 2030. Thus, an already difficult situation will be exacerbated in the coming years.

Where to source personnel from?

Ambitious offshore projects along the German coast planned in the coming years will certainly contribute to this trend. There will be a considerable demand for skilled workers to implement these offshore projects. But where will the personnel come from? Therein lies the problem. It is expected that this demand will be filled by enticing skilled workers away from onshore jobs.

For universities this is a clear signal to drastically increase their capacity for aspiring engineers. But universities and technical colleges are not the only ones with an obligation to act.

Keeping up with growth

For some time, independent service providers in the Wind Energy Service sector have attempted to combat the lack of skilled workers by training their staff and providing considerable

vocational training for young people in their employment. But companies cannot meet the enormous shortage of workers from their own internal sources alone. Politicians, too, have to provide additional measures to ensure the Wind Energy and all other renewable energy sectors have a chance to keep up with the growth. Points of contact in this context are job agencies, particularly in regions such as Emsland in which Wind Energy companies and their suppliers are concentrated.



For some months, agents of the Lingen job center have checked whether potential candidates for the Wind Energy sector are able to work at great heights.

benefit to job seekers. Educational organizations can have such programs certified. We, in turn, can then promote participation in such events.”

Getting people into employment

Job centers are issuing so-called training vouchers or vocational training cheques to job seekers, allowing them to purchase training suitable for their needs. Job seekers or interested parties are free to choose which educational organization they will attend. Some educational organizations work in conjunction with employers to ensure that the training can be followed up with practical experience, trial or similar forms of employment.

Focus on special requirements?

According to Hermann Fehring, it is not only the Wind Energy industry portion of the Renewable Energies sector that is experiencing a shortage of workers. “The growth of the sector is particularly visible in solar energy. Wind and solar energy are currently the only sectors where there is a considerable demand for personnel.” According to the Head of the Lingen job agency, special requirements for these growth sectors have now been incorporated in the interview sessions. “Our employer service, which is responsible for finding personnel, asks, amongst other things, potential Wind Energy candidates if they are able to work at great heights. This has been a key selection factor for some months to ensure a smooth placement of personnel within this sector.”

Personal responsibility of employers

The powers of the job center to counter the current and future shortage of skilled workers are, however, limited.

“As in the past, it is the personal responsibility of employers to cover the respective shortfall by, for instance, providing training outlets or vocational training for existing employees. Most of the Emsland companies are very active in this field,” added Hermann Fehring.

Correcting an error of judgment

The shortfall in skilled workers will not be remedied in the near future by making the companies themselves responsible. New occupational profiles, such as Wind Turbine Engineer will have to be created by the companies themselves and agreed upon by the local Chambers of Commerce. It is fatal, but we seem to be moving round in circles. This also applies to the general willingness to involve all those responsible and solve the problem together. It can certainly not be solved by pointing out that it is somebody else’s responsibly. A few years ago renewable energies still played a secondary role in the energy mix. Only few were convinced that the sector would develop into a growth market, let alone a global growth driver. Today, we all know this was a fatal error of judgment. ■

Intermediary function

Job agencies assist companies in finding suitable personnel when a vacancy is reported. “We are an intermediary between those looking for jobs and companies offering apprenticeships or employment. We offer services ranging from job exchanges to informational events as well as providing advice to job seekers and those that have left school – showing them what potential lies within certain sectors and professions and offering guidance about the labor market,” commented Hermann Fehring, Head of the Lingen job center branch.

Supported training

It is, however, not the task of the job center to produce its own training activities. Instead, job centers work together with educational organizations offering training and measures suitable for vocational training. “As a partner of these educational organizations, we also provide information about possible training programs – in the area of renewable energies, for example – which we believe to be of

Repowering: More is less. But for whom?



Since January 1, 2009, the EEG has been offering a repowering bonus. According to politicians, this bonus should serve as an incentive to replace existing turbines, particularly first generation turbines, with newer, more powerful WTGs while also further concentrating the locations of wind turbine generator systems. In order to provide an additional impetus for repowering, those involved and, in particular operators of individual WTGs, will have to do some rethinking.

The 2004 EEG Repowering Regulation, valid until 2008, which provided a higher payment only at the end of a long operating period, has not provided the required economic incentives to encourage most operators of individual turbines to abandon their existing turbine and invest in larger WTGs in wind farms,”

commented Wilhelm Wilberts, Chairman of the Regional Wind Energy Association (BWE), Eastern Friesland.

Focus on individual turbines

At that time, the municipalities, too, had not been ready to include sufficient options for a large repower-

ing in their development plans. “It is mainly a planning problem. Because of the stipulations of having to allocate specific areas for the use of wind energy in the development plans, such WTGs cannot be repowered at their original locations,” explained Wilberts. He emphasized, “The repowering applies, in the first instance, to older and smaller turbines located, in particular, along the coastlines of Lower Saxony and Schleswig-Holstein. Most WTGs located close to the coast are operated as turbines for which farmers have obtained special planning permission and are not located in the concentration areas. In the current financial crisis, many farmers are reliant on the income from their turbines to keep their farm viable.”

Maintaining instead of repowering systems

Consequently, considerable reserves for new repowering investments do not exist. For operators of individual turbines, it is not easy to become a member of a wind farm project in the immediate vicinity. Wilhelm Wilberts commented, "Once the initial cost of their own turbine has been recouped and it is providing a reliable income, the decision is usually made to keep the turbine running for as long as possible by maintaining and repairing it regularly. The incentive of operating the turbine for as long as possible – while at the same time saving costs because rent is not being paid for the site – is greater than the incentive for investing in repowering."



Wilhelm Wilberts, Chairman of the Federal Regional Association for Wind Energy (BWE), Eastern Friesland.

A tempting offer

However, when an existing turbine becomes old and requires repowering, the planning permission will no longer apply to the existing site. Operators of single turbines – particularly operators of first generation WTGs – should begin considering repowering in light of the current conditions. Operators of individual

turbines can, for instance, obtain up to five times the output of their former turbine if they take part in a repowering project on a wind farm. Where, for instance, a 500 kW turbine is repowered by a 2.5 MW wind farm, operators will receive a repowering bonus of 0.5 Cent/kWh for the full power input of 2.5 MW.

Necessity to rethink

Although it sounds like an attractive proposition, it is easier said than done. Wilhelm Wilberts says, "Some rethinking about the planning of new wind farms is required in order to remove the current hurdles regarding suitable areas. As repowering can only occur in areas provided for this purpose by parishes, municipalities or counties, parties interested in wind farms and,



in particular, owners of individual turbines, must be mobilized to use these areas." Specific examples already exist. In the county of Friesland, all operators of individual turbines of one parish have joined forces and have, in conjunction with the municipal government, searched for a suitable location for a wind farm project in order to secure this site. Considerable progress has already been made with the planning process.

Overcoming many hurdles

"Such an approach does, however, only make sense if everyone is actually working together, as individuals will always find it difficult to get involved in a repowering project. A prerequisite for a repowering of individual turbines is also having the correct connection for feeding power into the grid. It is well known that this was also a considerable problem in coastal regions in the past," said Wilberts. "Strict conservation legislation and the greater distances required between WTGs and residential areas do not make it any easier for planners today. The facts that a repowering will, however, also concentrate WTGs sites and that fewer turbines will produce more power, should, in view of an additional reduction in CO₂, be taken into consideration by the responsible politicians and approval authorities as an argument in favor of new wind farms." Operators whose turbines are already located at so-called "preferred wind energy sites" will consequently have it easier. Wilhelm Wilberts, too, aims to repower five turbines at such a site over the next five years.

More impetus for repowering?

Fewer individual turbines, and more wind farms with technologically sophisticated large-scale systems and thus more power from fewer WTGs, are convincing arguments for repowering. Ultimately, however, the possibilities and prerequisites for suitable sites for such projects will have to be established. It must also be calculated whether the investment will pay for itself in the long-term, particularly in the case of repowering of individual turbines. It therefore remains to be seen whether the required impetus will be provided for the still relatively new repowering bonus. ■

Repair of rotor blades.

*Reduced noise emission –
more power
and operational reliability.*

Regular inspection and preventive maintenance of rotor blades not only contributes to reducing noise emissions but also has a positive effect on the performance of a WTG. A fact of which Gerhard Göckenjan, Joint Director of Windpark Hollich GmbH & Co. KG together with Jörg Tiemann, is convinced.



As the Hollich wind farm in the district of Steinfurt is operated as a Bürger wind farm, it is environmentally friendly and represents an acceptable burden for local residents.

and ensuring a fair distribution of the tenure, little adverse effect on the agricultural areas and the environment, and an acceptable burden for local residents. Currently the association operates 18 wind turbines as Bürger wind farm.

Ensuring an optimum blade condition

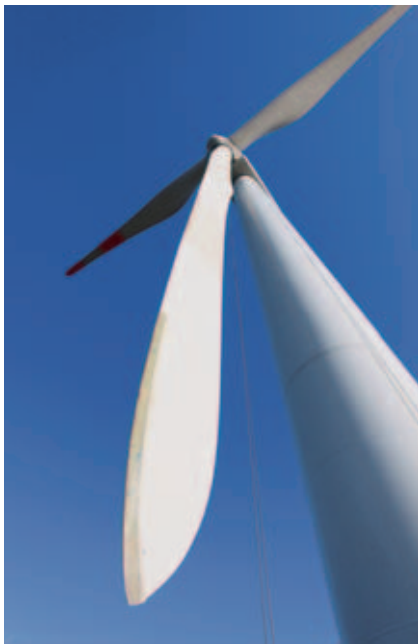
“During an inspection of the rotor blades by an independent service company in 2006, defects were detected that meant preventive maintenance of all rotor blades of the 1.5 MW turbines in the wind park had to be carried out in order to ensure the optimum condition of the blades in the long term,” remembered Gerhard Göckenjan. The detected defects included removal of production faults as well as normal or detected signs of wear on the rotor blades, such as a cracked paintwork or damage caused by lightning strikes.

With the construction of 11 wind turbines between 2001 and 2002, the Bürger (private citizens) wind farm in Hollich, district of Steinfurt is taking shape. This ambitious project, in which various investors showed an interest, was initiated after the allocation of a preferred wind energy site by Münster District Council in 1997. In the autumn of 2000, the local Burgsteinfurt Agricultural Association first came up with the idea of possibly handling the planning and operation of a wind farm themselves. The members quickly decided that it had to be their own company working for the benefit of all those involved



Noise emission due to erosion

“Furthermore, defects from manufacturing – such as cavities and burst air bubbles – were found. Parts of the leading edges of the blades also showed above average



signs of erosion.” A sign of erosion is a considerable roughness along the leading edge of the rotor blades, causing vortexes. “Such a condition has a clearly noticeable adverse effect on the noise generated. The problem is often noticed because of the increased noise of these turbines.”

Efficient protection

According to Gerhard Göckenjan, the vortexes created as a result of the erosion also adversely affect the aerodynamic characteristics of the

turbine. “The service company we commissioned first repaired the erosion damage by applying, amongst other things, resin layers and fabric inserts. The company also recommended a special paint finish to provide improved protection against future corrosion.”

Correct equipment = quick repair

It is common knowledge that, depending on the condition of the rotor blades and current weather situation, the repair of rotor blades takes time. In order to ensure that the required work is carried out as quickly as possible, thus avoiding a longer standstill of the turbine, it is important to ensure that the right equipment is used.

“A year ago we still used a hired working platform. However, working on the platform proved difficult

It takes approximately three to four days to repair the rotor blades of a turbine. Repairs could, however, take as much as two weeks in the case of adverse weather conditions.



and delayed repairs unnecessarily. Now, the service company is using its own specially developed platform, not only offering sufficient space for working on the blades but also adequate room for all required tools and materials,” said Gerhard Göckenjan. Göckenjan added that while securing the platform to the rotor blade hub took longer, the repair was carried out quickly. Once the platform has been secured, all rotor blades can be quickly accessed. “So far, the rotor blades of five turbines have been repaired. Approximately three to four days are required per tur-

bine. The repairs could take as much as two weeks in the case of adverse weather conditions or when more complex repairs are required due to the condition of the rotor blades.”

Focus on rotor blades

Gerhard Göckenjan and Jörg Tiemann are very happy with the work and progress made on the wind farm. “Preventive maintenance goes a long way towards ensuring maximum availability of a WTG. Monitoring the condition of the rotor blades is, however, essential.” The operators therefore inspect the rotor blades of the turbines on the Hollich wind farm at least once a year themselves. In addition, regular visual checks are made during the semi-annual turbine maintenance.

“A detailed inspection, using the known abseiling technique, should be carried out every four years. By



using a platform for such inspections, any work deemed necessary can be carried out immediately. If there are any irregularities detected during visual inspection or via acoustic anomalies, it is advisable to carry out an immediate inspection,” recommends Gerhard Göckenjan, who is using the current inspection to apply a white/red top coat to the rotor blades: “We are seizing this opportunity to replace our day-time obstruction lights with this top coat as the lights proved to require too much maintenance and became too costly.” ■

Managing bottlenecks. When 600 ton* cranes become scarce.



Lattice boom cranes available to the Wind Energy sector currently range from 400 ton to 750 ton*.*

The reason for this was an accident with a 500 ton* telescopic crane, which occurred 18 months ago during the disassembly of a 33 ton* rotor spider at a hub height of 100 meters. According to a crane company the type of crane used during the accident may no longer be used for this load.

Specifications – the measure of all things

Generally, crane manufacturers do not comment on accidents. This also applies to the crane specialist Liebherr. “It does not make any sense to make any recommendations as a result of this accident as to which cranes can or cannot be used for certain work. Each

crane comes with load charts, which are thoroughly checked by us. Provided that our customers – predominantly crane leasing firms – use our cranes within our supplied specifications, the cranes will be operated safely,” explained Wolfgang Beringer, Director of Sales Promotions at Liebherr-Werk Ehingen GmbH.

Larger turbines require larger cranes

The trend in the Wind Energy sector is to use increasingly large turbines, generating more power and thus, also increasingly, heavy machines and components and higher towers. “A telescopic crane with a comparatively low carrying capacity of 400

tons* can basically only be used for repairs on wind turbines today. Lattice boom crawler cranes with the same carrying capacity are also still in use. By now a special model with an overall chain width of less than five meters and offering improved maneuverability is available. Where such a crane is used in wind farms, the equipment does not have to be dismantled when moving from one turbine to the next on the wind farm,” stated Beringer.

400 t cranes for repair work or smaller turbines*

Lattice boom cranes available to the Wind Energy sector range from 400 ton* to 750 ton* cranes. The current

Heavy-duty cranes are vital in the Wind Energy sector for the installation of turbines or transportation of heavy components at lofty heights. In other words, for the installation or disassembly of generators, rotor blades, gearboxes, etc. According to statements by industry experts, there are current bottlenecks, in particular as regards the availability of 600 ton* cranes.



limit probably lies at a carrying capacity of 1,350 ton*. Such a Liebherr crawler crane was used a year ago to lift a load of 330 t* onto a 130 m high 5 MW turbine. According to Wolfgang Beringer, the “lighter-weight” cranes are still used for the installation of comparatively small WTGs, such as 1.5 MW turbines. These cranes are, however, predominantly used abroad and in developing countries. “The trend, however, is clearly towards cranes with higher carrying capacities.”

Focus on avoiding bottlenecks

Last year, Liebherr consequently launched a 600 ton* crawler crane.

“From the outset there was a considerable demand for these cranes. Due to relatively long lead times, bottlenecks were inevitable and some customers decided to purchase 750 t* cranes instead.” Liebherr endeavors, however, to avoid such bottlenecks and launch new models that offer an easier installation on site as well as improved road transportation.

Larger does not always mean more expensive

In view of the higher lease costs for larger cranes Wolfgang Beringer commented, “As crane manufacturers, we have to think about the future and thus provide equipment that can cope with higher turbines and heavier

loads. From a cost point of view, it is clear that larger cranes are always more expensive than smaller cranes. Our lattice boom cranes can, however, be constructed to a variety of configurations. The most simple and also the most cost-effective and popular solution for our customers is a main boom system without derrick, that is without a lattice jib and additional ballast at the back of the crane. Such a derrick system always creates additional costs, not only because of the hardware but also because of the required logistic and installation effort. A 600 ton* crane with a main boom system may therefore be cheaper than a 400 ton* crane that can only provide a certain carrying capacity when used with a derrick boom.” ■

* metric ton = 2205 lbs = 1000 kg.

“GL will position itself clearly in the renewable energy sector”

What are the post-merger plans of Germanischer Lloyd and Garrad Hassan?



Volker Köhne, Regional Business Manager Renewables Europe at GL.

Germanischer Lloyd took over Garrad Hassan in August 2009. What were the reasons for the takeover?

VOLKER KÖHNE:

For us it was a merger of two companies that fit well together. Germanischer Lloyd had repositioned itself during the previous year. We see a world-wide demand for intensive consultation throughout all phases of the development of a wind farm – i.e. from initial studies up to the commissioning stage. GL aims to of-

The companies Garrad Hassan and Germanischer Lloyd merged in August 2009 with the aim of becoming a world-wide leading service provider in the renewable energies sector. ON SERVICE interviewed Volker Köhne, Regional Business Manager Renewables Europe at Germanischer Lloyd about the company's future plans and about potential conflicts of interest for this new major player in the Wind Energy sector.

fer a one-stop-shop, providing considerable consulting services from one source. Garrad Hassan was already known to us and we knew that the companies would complement each other perfectly. Garrad Hassan has extraordinary technical competencies and an excellent position in the global market.

Prior to the merger, Germanischer Lloyd and Garrad Hassan had been working together successfully for some considerable time. So why was a merger preferred to an existing 25-year partnership?

VOLKER KÖHNE:

There has indeed been a partnership between the companies for some time. But the really close cooperation of a partnership cannot be as intensive as can be found by being one company. Garrad Hassan is a

group of 20 individual companies. We acquired 100 % of the shares and will merge the activities of this group with our activities in the Wind sector – i.e. with Helimax, WINDTEST and our own Consulting and Engineering services – to form a global organization. This can only be achieved if you are of a certain size.

Garrad Hassan operates world-wide as a service provider for the Wind Energy sector. Germanischer Lloyd certifies products in this area. Do you not think that this may create a potential conflict of interest in future?

VOLKER KÖHNE:

As an independent certification company, it is our responsibility to observe the special status of the certification. And we will, precisely for this reason, separate the organiza-



A perfect merger: from left, Pekka Paasivaara, Member of the Board of GL, Andrew Garrad, CEO Garrad Hassan and Hermann J. Klein, Member of the Board of GL.

tional, legal and personnel aspects of our certification activities from other activities in the Renewable Energies sector.

Does Germanischer Lloyd aim to enter areas of business in which independent service providers are already active worldwide?

VOLKER KÖHNE:

Garrad Hassan has a strong position in the consulting market. The British company is well known throughout the world. The range of consulting, design and software services is constantly being extended. In the areas of product certification, inspections and measuring, GL enjoys a not inconsiderable long-term loyalty from its clients. In the future, we will focus our consulting services on manufacturers, operators, suppliers and authorities. Through

its "System Certification" division, GL offers industrial clients auditing of quality management systems, etc. This division is, however, not connected to our Renewables business unit. This is where we draw a clear line.

Just to reiterate the question so that we fully understand: Germanischer Lloyd thus does not want to enter areas in which other independent service providers for WTGs are already active worldwide?

VOLKER KÖHNE:

If your question refers to the traditional areas of business of WTGs service providers, such as the maintenance, repair or servicing of WTGs, I can categorically state that we will not operate in these areas. What is important to us is to point out that we will make a clear separa-

tion between consulting and product certification. This also applies to the certification of quality management systems of WTGs service providers, which will be carried out by our separate "System Certification" division.

Is Germanischer Lloyd going to provide a service other than in these key areas or a wider range of services?

VOLKER KÖHNE:

With Garrad Hassan we now have an extremely comprehensive range of services from which our worldwide customers can benefit: Through our network, we can provide nearly all of our technical services on site. We are also working on being able to offer our technical services throughout the entire range of renewable energies. This is considerably easier with

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a large team. Apart from solar energy, we are involved in many research projects dealing with generating energy from the sea, i.e. wave and tidal power plants. We are looking at this area in detail and also offer consulting services for a few prototypes. When looking at medium-term yields, however, solar and wind energy will continue to play a major role for some time.

With the acquisition of Noble Denton you have also gained offshore competence. Is this merger also a reaction to the planned offshore projects along German coastlines?

VOLKER KÖHNE:

As a result of the acquisition of Noble Denton, GL has become a worldwide technical testing and consulting company for the oil and gas industry.

agement for various Offshore Wind Farm projects. We can thus offer convincing concepts for the entire project management of an Offshore Wind Farm. A fact that we welcome, as this competence could be very helpful in future offshore projects.

Is Germanischer Lloyd planning further takeovers in the near future? And if yes, what areas are you considering?



As the worldwide leading provider of marine and offshore engineering services, Noble Denton is also a partner for the development of services in the Renewable Energies sector.

Can you give me any information about the new size of Germanischer Lloyd? How many employees does the company currently have?

VOLKER KÖHNE:

At present, GL has nearly 7,000 employees. In the Renewables division we now employ 600 experts in renewable energies.

Services range from design and construction to transportation and to the development of a plant over its entire lifetime up to its dismantling. As the worldwide leading provider of marine and offshore engineering services, Noble Denton is also a partner for the development of services in the Renewable Energies sector. Noble Denton handles, for instance, the project man-

VOLKER KÖHNE:

After acquiring eleven companies during the last three years, our strategy of organic and inorganic growth will continue in future. Wherever the need for additional expertise and competence arises and opportunities offer themselves, GL will take advantage. ■

Uniform designation system for Wind Turbine Generator Systems.

What are the advantages of standardization?



The pioneering times lie behind us. Wind Energy has become an industrial and economic sector that must be taken seriously. The VGB (Association of Large Power Plant Operators) and other bodies in Germany are therefore very keen to introduce a uniform, and thus standardized, designation system for Wind Turbine Generator Systems (WTGs). In view of the legally stipulated inspections, this regulation not only aims to provide benefits for operators of WTGs but for all involved parties.

From KKS to RDS-PP

With the Power Plant Designation System (KKS), the manufacturers of power plants produced a worldwide standardized designation regulation for power plants at the beginning of the 1970s. And in 1996, as a result of changes to, or discontinuation of, basic standards contained in the KKS, the VGB took the opportunity to create a DIN/ISO standard from the standard used internally by the association.

In April 2007, the DIN Joint Committee for Designation Systems published DIN 6779-10 "Structuring principles for technical products and technical product documentation – Part 10: Power plants." A reference in this standard to the basic IEC-61346-1 standard with the subtitle "Structuring Principles and Reference Designation" provided the name for the standard succeeding the KKS: the RDS-PP – Reference Designation System for Power Plants, which became the worldwide valid standard ISO TS 16852-10 in June 2008.

Focus on uniform regulation

The Working Panel Wind Energy was set up in the VGB in 2002. The approximately 40 members of the working panel started an initiative for achieving a uniform designation for WTGs. "Photovoltaic installations, Biogas plants and WTGs are also power plants. Consequently a uniform designation is required for all plants generating electricity or heat to enable a uniform use of language for all objects. The RDS-PP provides, in a manner of speaking, the grammar to create a uniform

use of such language," commented Axel Ringhandt, Deputy Chairman of the Working Panel Wind Energy and Technical Director of the Windstrom group, specializing on project development, financing, turnkey installations and marketing of wind farms.

Object-orientated designation

In another Standardization Organization for Renewable Energies, Fördergesellschaft Windenergie (FGW), the "Expert Committee for Servicing" has the important task of determining regulations for the servicing of WTGs. Axel Ringhandt added, "A prerequisite for this is an object-orientated designation of all plants and systems of a wind farm and all components of a WTG. Two aspects must be observed and strictly separated from each other for such a designation: What is the task of the component in the WTG – the functional aspect – and where is it located in the turbine – the location aspect."

Such fundamental "sorting criteria" were and are often still randomly selected in the Wind Energy sector. "The result has been a mixture of function, location and sometimes random intuition with very different structures," cautioned Ringhandt. He also emphasized, "The time has come for another abstraction step and for creating fully functioning subsystems."

Clear assignment of systems instead of intuition

An example of this is the lightning protection system. As the system used by wind energy companies for



Axel Ringhandt, Deputy Chairman of the Working Panel Wind Energy and Technical Director of the Windstrom Group.

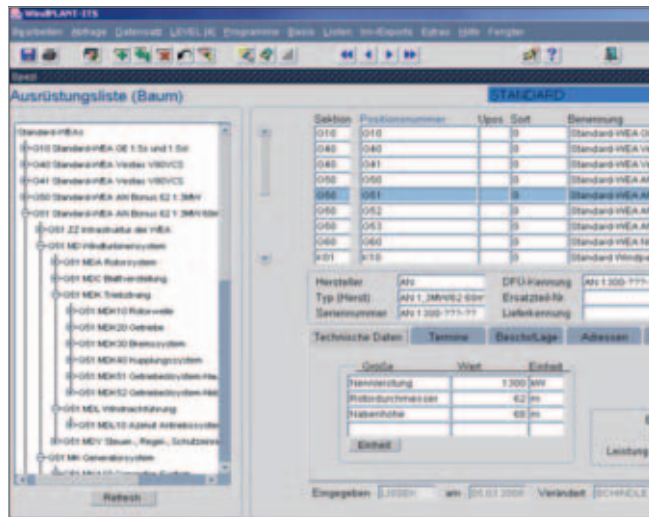
assigning components is, in some cases, based on a considerable level of intuition, the lightning conducting system is sometimes partly assigned to the rotor blade, as this is where components of the lightning conducting system can be found (receptors, discharge, brushes, etc.). All components of the lightning protection system do, however, form a coherent, interconnected system with its own engineering and documentation. Due to its function being fully independent from the lightning protection system, the rotor blade is to be assigned to the aerodynamic system of a wind turbine with its own designation.

"Such systems, applicable for all WTGs, would provide the decisive set of rules for the servicing or inspection of turbines and would thus accurately define what and how the inspection should be carried out. In

addition, the TÜV (German MOT service) does not check the compression of a motor, although it would be technically possible to do so. A clear regulation, does, however, state that this is not relevant for the road safety of a vehicle.”

be interested in a fraction of the results and, consequently, the tests performed do not offer any actual indications of the stability of a turbine.” Everybody involved was therefore forced to dig through a considerable amount of potentially irrelevant information instead

based, preventive, status-based or reliability-based – in order to minimize the life cycle cost (LCC) of the component. Axel Ringhandt described the benefits as follows: “A reliability-based servicing strategy offers the option of commissioning third parties to calcu-



A reminder function could log defects detected during the inspection that are not serious at present time, ensuring that the respective part of the turbine or the respective component is not forgotten.

Without ifs or buts

Designation systems created on the basis of uniform sorting criteria do, however, have to be agreed upon with the respective approval bodies, test organizations and last but not least the turbine manufacturers and insurance companies prior to their introduction. In this area, considerable amounts of work still need to be done by the expert committees of the VGB and of the FGW, as only a system that is agreed upon by all parties will present a solid solution.

Result-orientated inspections

So far, however, reality differs somewhat. Axel Ringhandt described the dilemma as follows: “It is easily possible that a service company or expert carries out an enormous amount of work during a legally required inspection that is actually not necessary. For example, building authorities may only

of the testing data and results being tailored to the respective “target group” (e.g. insurance companies, building authorities, etc.). “In addition, data would no longer be provided in hard-copy but in digital format,” added Axel Ringhandt.

Better overview, lower costs

Apart from considerably speeding up test processes, such procedures would also offer a number of advantages, particularly for turbine owners and operators. The dedicated overview of the condition of individual components of a system would, for instance, make it easier to monitor warranty periods for such components. A reminder function could log defects detected during the inspection that were not serious at the time, ensuring that the respective part of the turbine or the respective component is not forgotten.

An operator could then decide on the ideal servicing strategy – failure-

late the failure frequency or probable life of specific components. In this way, components can be replaced in good time prior to their failure, thus preventing any turbine downtime. Also provisions for, the change of a gearbox, for example, could be made beforehand,” with the Deputy Chairman of the Working Panel Wind Energy not leaving any doubt that this procedure would result in considerable cost reductions and substantial savings in time.

“There is, however, still a long way to go. Hardly any reliable documentation exists, particularly from the early stages of the Wind Energy sector, which could be used as a basis. We do, after all, have to produce a uniform regulation for approximately 100 different types of WTGs with a variety of different options, such a tower height and construction, production batches, features, etc. We are nevertheless confident that all main WTGs will have been classified by the end of 2010.” ■

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