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Windy commitments in Hamburg

Around 200 crane wind industry people met up in Hamburg in March to discuss crane and lifting safety strategies in the wind turbine industry at the first ESTA wind safety summit. The meeting follows a spate of serious incidents involving cranes lifting turbine components or relocating on wind farm sites, as well as the transportation of larger components.

In this issue we report on the meeting and touch on the key points made and subjects discussed. Detailed summit presentations will be covered in our wind turbine issue next month.

The meeting was well attended by the crane and transport companies, wind turbine producers and crane manufacturers with presentations by industry specialists, a leading wind turbine manufacturer and two major crane producers. With the formal agenda running well ahead of schedule, there was a very healthy and extended question and answer session at the end, which turned into an open debate/discussion on the subject.

After a number of short introductions ESTA secretary Søren Jensen highlighted how fast news of major crane accidents is reported these days, thanks to the internet and how it has highlighted the problems being experienced in the wind industry - not only to contractors, competitors and safety authorities, but also to insurance companies and other parties with a financial interest in the sector. Last year was the worst ever in terms of accidents and he stressed that if the industry itself does not do something governments certainly will. He also pointed out that 'near misses' are rarely reported and as a result valuable information is rarely shared.

"A repeated mistake is surely stupidity"

"If we repeat a mistake it is surely upgraded to a stupidity," he said,

emphasising the need for the industry to share information if things are to really change. "If we do not solve our problems, our governments will do it, and they will do it without us. They too read the internet and meet up regularly."

He also raised the issue of low-mass loads, something that is significant for the wind industry and is set to grow, with the introduction of even larger and lighter rotor assemblies. The European manufacturers association FEM issued a note on this subject in 2010, but it has largely gone unheeded.

Wind industry veteran Per Krogsgaard of BTM consultants highlighted how the industry is growing each year and warned delegates that turbines are likely to get bigger. Rotor diameters of 150 metres and nacelle weights of 400 to 500 tonnes lifted to 150 or more metres high are being planned.



An assembled rotor, in spite of its weight is a 'low mass load' thanks to its drag coefficient, blade surface area and light weight



Christian Jacques Vernazza, president of ESTA opens the summit

Possibly the most significant presentation came from Paul Ejro Okpurughre of turbine manufacturer Siemens, supported by a strong company delegation. He highlighted his company's 'Zero Harm' policy that began to gather momentum toward the second part of 2011. To emphasise the point he used a video featuring Frank Kröger - a survivor of the fatal lifting incident in Harwich, UK, in 2010 - talking about the injuries that almost took his life and stressing the importance of greater safety. "Take a look twice or maybe three times before you do something - you have to," was his message.

Okpurughre clearly and unequivocally stated that for Siemens 'safety comes before all else' and said that corporate clarity on this is summarised in a statement from its Wind Power chief executive: "We will never compromise on safety, no matter what the deadline, no matter who the customer." He added that achieving Zero Harm would only be possible with the full co-operation of

its sub-contractors and to this end it organised a Zero Harm Workshop for 70 sub-contractor personnel in September. The company says that while overall accident rates on its sites fell 60 percent between 2009 and 2011, equipment damage increased and that it plans to focus on this in the year ahead.



Paul Ejro Okpurughre of Siemens

"No task is so urgent not to do it safely"

It was clear from the later question and answer session that most of the crane delegates have yet to be convinced that wind turbine companies are truly putting safety before cost. Criticisms raised included the short contract lead times of perhaps just two to three weeks to plan highly complex lifts and access roads on many sites being built too narrow and to a lower standard. Comments included: "As a serious company we find ourselves offering a fully planned contract lift in competition with a taxi crane quote". Others claimed that pricing pressures from the wind turbine companies resulted in the smallest possible crane being used for the job, effectively eliminating additional safety margins that most agreed was required to cope with the effect of wind on fully assembled rotors and other components.



Many wind farm roads are too narrow and not designed to take rigged cranes

Liebherr's Hans Dieter Willim provided the most educational presentation of the day looking at the effects of wind on mobile cranes while lifting loads with a large sail area. He showed how standard EN13000 load charts assume a sail area of 1.2 square metres per tonne of weight and that anything greater than this requires the adoption of a lower load chart. Another factor is the drag coefficient of different loads which can be as low as 0.2 or 0.3Cw for a curved surface, while flat sided loads can have a coefficient of 1.1 and more. A general assumption for an average crane load is 1.2Cw, however a wind turbine rotor is typically 1.6Cw!

The combination of a high drag coefficient with a low weight to sail area ratio can easily lead to abnormal and even dangerous forces on the crane's boom tip. EN13000 assumes a maximum side load of two percent of the rated load, while ANSI standards assume three percent. Willim stressed that these levels apply specifically to the force on the boom nose and not the boom itself, so talk of lattice booms being less susceptible to wind forces than telescopic booms is completely misguided. He also dispelled another common assumption that as long as the

crane is lifting well within its load chart the wind effect is not critical. The fact is that a rotor in mid-lift catching a side wind can easily generate a side loading well in excess of the two or three percent and cause the boom to collapse, even though the crane maybe lifting well within its load chart. If the boom does not buckle from such a side loading, there is the risk that the ground may give way, as the side loading transfers to the outriggers, spiking their loadings by as much as 32 percent. While on the subject of side winds, they hardly register on the load indicator while one coming from the front of the crane will reduce the load reading and one from behind will increase it.

Even the most experienced crane men attending admitted to having had their 'eyes opened' by this presentation. This topic will be covered in more detail in our next issue. Willim also said that Liebherr has now developed easy to use charts to calculate for different sail areas and drag coefficients and is looking at adding some of these factors into its Licon load indicator. It has also developed a CD entitled Influence of wind on crane operation, which provides a technical overview of the subject for lift planners etc.

Moving cranes

Crane movement on site was another major subject covered in some detail by Klaus Meisner of Terex, who blamed the increasing number of overturns on sites on access roads that can only cope with cranes in their road-legal state, as well as the trend to reduce their overall road width. This in spite of the fact that time and cost pressures frequently lead to cranes being moved fully rigged along these



Moving cranes fully or partially rigged can have disastrous results

same roads sometimes with disastrous results. He also said that operators are often unaware of the crane's raised centre of gravity when travelling fully rigged. The need for basic common standards for wind farm access roads was something that ESTA and all other relevant parties committed to, with the aim to develop an industry standard.

Other commitments included: minimum standards for lifting contractors and a new effort on pan European crane operator licensing, something it has been working on for some time. One suggestion was made for a special crane operator course to be developed for installing and dismantling wind turbines. Turbine manufacturers could then insist that only those operators who had qualified from this course could work on their sites.

The meeting - the first of its kind was a credit to ESTA - was well

organised with some good presentations and a solid turnout. No wind turbine delegate could have left the meeting without a clear understanding of the international crane fraternity's view that the wind industry's relentless price, costs and time pressures are a principle cause for the industry's recent poor safety record.



At the same time few crane delegates would have come away without a renewed respect for and understanding of the effects that wind can have on wind turbine installation work. And perhaps some will have seen at least a tentative commitment from the wind turbine industry to stop taking crane safety for granted.

