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A load of interest

Although this year's CPA Crane Interest Group meeting - held at its usual venue in Hockley Heath, Warwickshire in September - was slightly down in numbers compared to previous years, there were plenty of topics of interest to the UK crane sector.

Chairman Neil Partridge welcomed more than 60 members from 40 companies representing a good cross-section of crane rental and end user companies and manufacturers. As well as the usual updates, there were several topical presentations such as the Influence of Wind on Crane operations and devices to measure the effectiveness of crane carrier brakes.

The influence of wind

Continuing to raise the awareness of the influence of wind on lifting operations, Tim Watson highlighted the problem of lightweight but large surface area items such as turbine rotor blades. This subject was highlighted at the ESTA Wind Conference in Hamburg, Germany earlier this year and by major manufacturers such as Liebherr which has produced a very good guidance document, a DVD and organised free training courses - more of which will be scheduled for next Spring.

"Crane manufacturers calculate capacity on the basis of typical loads having one square metre of surface area per tonne and a drag factor of 1.2," said Watson.

"However, turbine rotors, portable buildings and similar loads could have a surface area to weight ratio five times higher and a drag factor in the range 1.5 to 1.8."

Other factors include the fact that wind speeds in load charts are based on a three second gust speed at the boom nose, not the average wind speed at a 10 metre elevation over 10 minutes that is given in weather forecasts. He said that an additional 20 to 35 percent load needs to be added to cover these factors.

Lifting persons with cranes

In February of this year FEM updated its guidance on lifting



Neil Partridge

people with cranes, stating that lifting people for entertainment purposes is not within the design scope of a crane, making it a new machine for the purposes of the Machinery Directive. FEM says that a mobile crane CAN be used to lift people if additional technical requirements are fulfilled and there is a further assessment by a third party. Ian Simpson of the Health & Safety Executive said that there was no change in the HSE's position on lifting people at work. For entertainment purposes, it would not object provided it was done in accordance with FEM guidance and was properly planned, supervised and risk assessed.

Revision to EN13000

The Amendment to European crane design standard EN13000 is underway and expected to be published in 2014/15 with a further revision expected in 2017. The amendment includes clarification on wind loads, a limit on noise levels in the cab and the requirement for monitoring outriggers and retractable tracks. The revision in 2017 will include the use of EN13001 for stress and stability calculations, asymmetric outrigger position monitoring, interlocks and outriggers and greater protection for persons working at height on cranes.



Diarmuid Gavin's Sky Garden at the Chelsea Flower Show in 2011

HSE Fee for Intervention FFI

Simpson also covered the HSE's Fee for Intervention regime which came into effect on 1st October. Fees of £124 an hour are now chargeable for investigation work where there has been a material breach. He said that HSE inspectors would be more targeted in the inspections they make, but as construction is considered to be high risk, routine visits can still be expected. The HSE is likely to recover £30 million in the first year which equates to a third of each inspector's time being charged.

Road brake testing

With mobile cranes in the UK currently exempt from MOT testing - and no significant development since the last CPA meeting - independent verification of brake performance is not required. This may change as Barry Copeland - whose wife

and daughters were killed in an accident involving the lack of preventative maintenance on a mobile crane in Aberdeenshire in 2008 - is campaigning for a change in legislation to bring mobile cranes into the scope of an MOT test.

Whether or not this happens, owners are still required to ensure vehicles are maintained in a safe and roadworthy condition. Test equipment - such as a decelerometer or G metres - can help measure and compare braking efficiency. Simpson showed one such device and while it will not give a pass or fail reading, results can be compared with readings taken when the crane is new or after a brake rebuild. Basic decelerometers are available for around £300 with more sophisticated units that can print out results for around £1,000.



A range of decelerometers.

The big issue...

With the influence of wind on lifting operations becoming more prominent, we talked with Liebherr technical director Hans Dieter Willim, on the relative benefits of telescopic and lattice booms.

"Wind is a big issue and many people do not take it seriously," says Willim. "You can see when a boom bends, when an outrigger lifts, but you cannot see wind until the load moves and then it is too late."

Many people think that a lattice boom crane is better in windy conditions because the wind blows through the lattice structure - but according to Willim this is not true.

"A lattice boom acts in a very similar way to a telescopic boom because the surface area - when fully calculated - is very similar. Both have the same problem which is the load and not the boom. This wind problem has grown because of taller and heavier wind turbines and longer booms. The solution to wind is simple - use a bigger crane! But we all know that this costs more money to buy or rent so we use smaller cranes with just enough capacity for the job, hoping they will be ok."

"Training is essential and I can see a 'driving license' for European operators such as the NCCO in North America being implemented in the next few years. The ESTA wind conference was useful in highlighting the problems, but something simple that will help is giving the operator the area of the load and the drag factor as well as the wind forecast for the contract. Once the load is lifted and the wind speed increases you cannot do anything."

What are the relative benefits of a lattice and telescopic boom?

"When both types of boom are at their maximum capacity they are as safe as each other. However when



Hans Dieter Willim

your load is about 50 percent of maximum capacity the lattice boom is better because it works purely in compression and there is still a load on the boom. A telescopic boom with Y guy system works most efficiently when it has full load. If the crane has a certain capacity for the nacelle, when lifting the lighter rotors the boom is not working as efficiently. Cranes are strong when lifting in line and are not designed for side loads. These can be accommodated in the design but capacity reduces considerably - which results in using a bigger crane."

"For me the future is a single blade installation which takes only a little longer and saves set-up space however a lot of manufacturers cannot rotate the windmills during installation. Manufacturers are now realising that it is more dangerous lifting the whole rotor assembly. Offshore where there are higher wind speeds, blades have to be installed individually. However simple things such as lifting the blade flat and not in the upright position make an enormous difference - a factor of three - which makes the lift safer."



A Siemens wind turbine installation



The world's largest rotor being installed in Denmark

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