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SAME RED BUT NOW GREEN

By reusing or repurposing existing products there are massive savings in raw materials and energy, avoiding huge amounts of CO2 emissions when compared with manufacturing a new item.

This applies to every product - be it an item of clothing, a household electrical item and even a crane. At Vertikal Days, German tower crane manufacturer Wolffkran showed a fully refurbished 'as new' 29 year old 100B luffing jib tower crane which attracted a great deal of interest. We talk to Dave Holder, Wolffkran UK managing director and Niall Conroy, Wolffkran sustainability manager about the project and the potential for refurbished cranes as an alternative to new products.

At Vertikal Days Wolffkran tried something different...showing a refurbished 29 year old 100B luffing jib tower crane that is set to be added to the Wolffkran rental fleet.

"We wanted to show the industry that a fully refurbished, 'like new' crane is as safe and could perform as well as a new crane," said Holder. "And I think we succeeded."

To date Wolffkran has carried out four tower crane refurbishments including the 100B - the previous three driven by customers with various reasons for the refurbishment.

"The first was to a customer requiring a large capacity crane but couldn't wait the 30 week lead time. We had an older unit in the rental fleet which we refurbished in just 12 weeks. As well as supplying the crane quickly there was also a big saving compared to the price of a new crane. The crane is currently on rental to the customer who will probably purchase it early next year - a sort of try before you buy arrangement."

"Another was to a shipyard in Utrecht, Holland, that purchased two cranes in 2009 and wanted to replace the smaller with exactly the same unit. The model was no longer made and the replacements were either slightly under capacity or too big for the loadings, the requirements

were very specific as it had to be on a five metre travelling portal. All the engineering had already been done at considerable cost in 2009 and the customer ideally needed exactly the same crane. So we sourced the last similar crane ever made and completely refurbished it. He as completely over the moon with it and that is then we realised that there was some mileage in refurbishing cranes, it benefits everyone."

"As a company we had talked about the sustainability of refurbishment. After completing four refurbishments we are convinced that over the next few years it will become an integral part of our product offering. And because there are so many new parts used in the refurb and a complete repaint, it is very difficult to tell whether you are looking at a new or old crane."

THE 100B REFRUBISHMENT

The 100B at Vertikal Days was manufactured in 1996 but parts were still available off the shelf. Wolffkran supports all models for at least 11 years from the last day of the last model produced.

"First our Engineering department tested the welds on the structure of the 100B and only about two items were all that needed attention on the whole crane," he said. "I honestly thought we were going to have to rebore all the holes - but



only about 50 percent of the key connection parts had to be done - if they haven't worn out in 29 years it is probably not going to wear out in the next 10 to 15 years."

"We also put in two new 'old stock from 2007' winches and the originals will go back to the original manufacturer for refurbishment and be available for future rebuilds," said Holder. "We also carry out oil analysis as standard and can see the wear in the gearbox and any metals present



in the oil. We are waiting for the report on the winches - winches and gearboxes are a bit of an unknown as they are sealed units and have to be taken apart in controlled conditions. When the report comes back we can assess if we can use them on the next refurb."

"The inverters installed were brand new current units. By Q2 of next year we will have our new PLC version - Version 16 - and that will be used in all future refurbs. V16 gives a 3D colour screen, and interaction features such as turning the power down etc. This will allow all the modern features of a brand new crane to be available on the older refurbished models. The 100B is a bit of a stop gap as it doesn't have this latest version."

"Everything that is currently frequency driven is easy to refurbish as we can exchange the drive systems for more modern drives. If we get a request to refurb an older crane we would have to upgrade it to frequency drives as it is difficult to get the parts and the power usage of an old contactor driven crane is horrendous compared to those you can get today."

GOOD FOR THE ENVIRONMENT

"Several manufacturers have brochures showing what they can do, but we decided to take the crane to Vertikal Days so that people could have a close look at it 'in the metal' and the feedback was very good."

"In terms of the environment, the best thing we can do is extend the lifetime of the machines that we already have," said Conroy. "If the steel structure is still good and it is performing well - ie safety credentials and downtime are within acceptable parameters - then why not continue using it? The amount of emissions and wasted materials consumed in manufacturing new products is enormous, if we can use what

we have for longer then we will be really moving forward as an industry and start to bring in the concepts of circular economy and maximising lifetime. We just need to challenge some of the attitudes that exist, particularly some of the main contractors."

"It helps to start with a good, high quality product that has longevity designed and built into it," said Holder. "We know our tower crane products and with the Wolffkran history going back to 1913, we have the design history and experience."

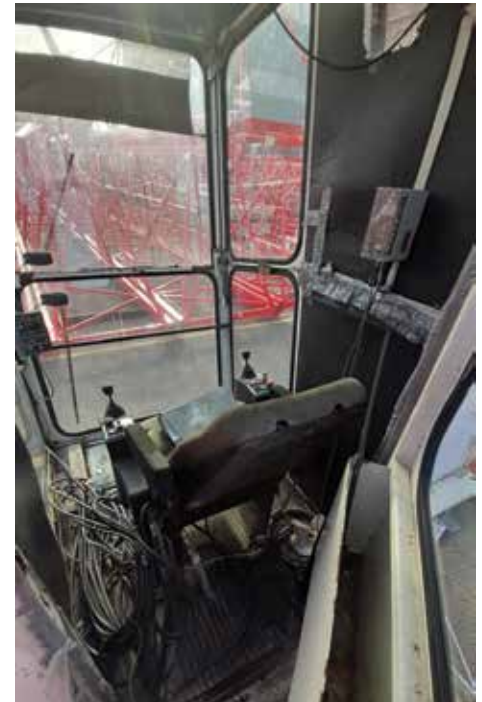
After being shown at Vertikal Days the crane is going into Wolffkran's rental fleet - the first of many key cranes that will be refurbished for the fleet.

WIN WIN SITUATION

"There is still a rental market for smaller capacity cranes, but it is saturated with cheaper models that have entered the market in the past 20 years," said Holder. "I did think that the quality of these products would have meant that they would be out of the market a while ago but they are still active. It is very difficult to compete in that market with a brand new €300,000 tower crane when your rates are down to £800 per week - it doesn't stack up financially. The refurbished crane is about 30 percent of the cost of a new crane so it is a win win situation - I can't see any disadvantage in terms of sustainability, environmental impact and commercial viability - it works for us as the margins are about the same for a new or refurbished crane."

ISSUES WITH MAIN CONTRACTORS AGE POLICIES

However all is not plain sailing. Wolffkran says it is having issues with some main contractors because of maximum equipment age policies - some less than 10 years old.



"When I ask why they don't allow equipment over a certain age they generally do not have a logical reason," said Holder. "They think that because it is over 10 years old it is not any good any more. We have done studies on availability data and they show that if properly maintained, availability does not diminish with age. You may get a few more cosmetic issues and possibly electronic problems because wiring goes brittle and casings break off. It often depends on the climate - cranes that have operated in hot environments are more difficult to refurbish. All the work we carry out during the refurbishment is traceable and documented."

"I ask why have you got an age policy? Are you frightened that it might fall over or concerned about the availability or reliability? However you never get a specific answer, there is just a 'policy' often copied, that has to be complied with and negates trying to have an open discussion about the concerns."

"Tower cranes are a bit like aeroplanes - they don't go wrong very often but when they do everyone knows about it. We do not want an incident so everyone is working as safely as possible and if I can address the concerns - the steel structure, spare parts, availability etc - I can answer each directly."





"We have had some success with several major contractors when they saw the extensive documentation for each crane. We are not trying to hide its age or sell it as a new crane. Each refurbished machine has its original birth certificate/date of manufacture as well as a second refurbishment date together with all the documentation of the work that has been carried out including photographs and all parts and part numbers as well as a new serial specific manual which reflects the work that has been done - not an original build manual."

"If you can supply the crane with all the documentation and details of the refurbishment then most are happy to have it on the jobsite. This was the whole point of going to Vertikal Days - we needed to establish the concept and have it accepted. There are still a few main contractors we need to talk to - interestingly one has a 10 year policy but has older Wolff cranes in its own fleet... the oldest being more than 30 years old!"

30 PERCENT OF NEW COST

"At 29 years old the 100B has a book value of zero. It works for us all - the customer is over the moon as he has a 'brand new' crane, we have a sufficient margin, the factory has more refurb work and Niall is happy as we are not throwing away old equipment."

REFURB PROCESS

Wolffkran refurbishments are carried out in Wolffkran's Lucklau factory in Germany where new cranes are also manufactured. Initially all the component parts are removed from the steel structure then sand blast down to bare metal. NDT testing is then carried out and the parts repaired as necessary. It is then repainted and assembled with new parts.

"The advantage is that the R&D costs have been included when the crane was first new. These can be significant and as much as €2 million for a new model. Some of the bigger cranes may only sell 10-12 units throughout their lifetime so as a

proportion of the total cost it is significant. The 100B sold over 50 units but in its second life this is already paid for."

COMPETING WITH CHEAPER CRANES

"Our new products are high quality and can be seen as expensive, we suffer in the market because we are not competitive in certain sectors. However we are trying to broaden our customer base particularly in the smaller capacity sector. There is intense price pressure on 140/200 tonne metre tower cranes - the most lucrative market in terms of units sold - but we are not competing because we are seen as too expensive."

"Our tower system is built around a flexible system. We have a rental fleet of about 800 units around Europe and I can get any combination of components to achieve the result. However if you are a customer requiring the same crane to do the same job - ie in Czech Republic a four apartment footprint, four storeys high requires a tower crane with a 36 metre tower with 45 metre jib. That is the market we are not in. However we are looking at a bespoke tower and cross frame system where it will get to 40 metres and sit on a 4.5 metre cross frame. There isn't the same degree of flexibility but it takes out a considerable percentage of the cost. This will hopefully be launched by the next Bauma at the latest."

"By refurbishing the cranes, it gives Wolffkran another means to compete with the cheaper cranes entering the market without lowering quality and providing customers with the same quality they expect from a Wolff crane," said Conroy. "What worries me about some of the cheaper cranes entering the market is that they are pandering to this five or eight year age policy which creates a disposable market for tower cranes. Tower cranes should never be disposable - something that takes that amount of investment in materials and energy should always be refurbished and reused. From 2024 stats, the

energy used solely in manufacturing a new crane is about 120 tonnes of CO2 which doesn't take into account the impact of the materials etc. The best case scenario for refurbishing a crane is less than 10 tonnes of CO2 - a saving of up to 92 percent over manufacturing a new crane."

WHATS NEXT?

Wolffkran currently has three cranes being refurbished. However it says it needs to concentrate on the larger capacity models as the margins are obviously greater and current demand is for larger cranes.

"We are looking at buying some larger cranes built in 2007 and 2008 from a customer and because of the demand for this size of crane that would work," said Holder. "The crane we refurbished for a German customer would have been €1 million to purchase new, however the package we did for them was €400,000!"

Each refurbishment is carried out on an individual basis, only changing items that need replacing or the customer can taper the level of refurbishment to the budget.

HOW SUCCESSFUL CAN REFINISHMENT BE?

"We have to run the refurbishment programme alongside our new sales. For the rental fleet it works for us particularly the larger models as we know the full history of all the cranes. If the tower crane market is busy and rates go up, then customers buy new cranes. Unfortunately at the moment it is very flat in many countries and it is too cheap to rent so new sales are impacted. We are still producing 40-50 cranes a year purely for our 800 strong rental fleet whereas other manufacturers have cut production."

Refurbishment is a new concept that needs to be accepted by customers because it ticks all the boxes - reduced costs and reduced environmental impact. ■