

# As good as new

**With new cranes in short supply and delivery times lengthening, the pressure is on for users to get the most out of existing equipment. Repair and refurbishment offer opportunities to extend service life. LINDSAY GALE reports**

**S**ervice life extension projects (SLEPs) are a growing activity for crane repair companies (and for manufacturers). Take US company Wheco Corp as an example. Jay Shiffler, vice president and director of business operations told IC, "Wheco has been doing SLEP projects for more than 25 years. The concept is to develop a specific and cost effective scope of work that will extend the working and revenue generating life of a piece of equipment."

A good example, Shiffler explains, is conventional lattice boom truck cranes. Limited availability and high replacement costs make them excellent candidates for a SLEP, Shiffler says. As an example, Wheco recently carried out SLEPs on two Link-Belt HC 238A lattice truck cranes. Both were 20 years old and were part of a large and heavily

**Wheco Corp carries out full renovation on a wide range of equipment, such as this Link-Belt lattice boom truck crane**



**Twisted frames such as this one from a rough terrain can be repaired effectively**



used crane rental fleet. A scope of work, short of complete restoration, was created by Wheco to extend the working life of the machines by between 7 and 10 years, with the restoration cost evaluated against the expected revenue stream and operating expenses. The company is carrying out similar work for the same customer on two more units.

Rough terrain cranes are also good candidates for SLEP work, Shiffler says. "Often considered disposable cranes, rough terrains can be simple and very cost effective to SLEP. Again, a cost effective scope of work can be measured against the potential revenue stream and operating expenses to determine the feasibility of a SLEP."

When it comes to repairing accident damage several factors have to be taken into account, Shiffler says, but the decision to repair or replace major structural components and parts, or the entire unit, is ultimately a financial consideration. These are based on the crane's market value, insurance coverage, overall condition of the unit, cost of repair over replacement, unit downtime, expected service life after repair, expected salvage value and whether a salvage buyer would part it out or have it repaired.

The most frequently damaged cranes appear to be mobile hydraulic truck, all terrain and rough terrains, according to Shiffler. Rough terrains in the US are typically bare rented, which makes them more vulnerable, and

the mobile hydraulics have a high utilisation rate, travelling the US highway network between jobs. Shiffler says accidents with conventional crawlers do happen, but less often.

## Age old repair

Equipment age does not affect vulnerability to accidents, but it has an effect when determining the feasibility of repairing or replacing parts, components or the entire unit. Boom and jib repairs are the most common type of work resulting from accidents or misuse, but bent and twisted frames and cab damage resulting from accidents is common.

But what about quality? All repairs done by Wheco, for example, comply with OSHA, Cal-OSHA, ANSI and AWS standards, and the company guarantees that its repairs are inspected and certified by an independent third-party crane certifier. Documentation is provided for all engineering repairs, including engineering, material analysis, welding procedure specifications and test records, and NDS test reports.

Dutch company Avezaat is another company seeing increased volumes of repair work for cranes around the world. There are two reasons behind this growth, according to Bert Avezaat – a trend for equipment life to be extended, and increasingly stringent safety and certification requirements.

Virtually every crane type and brand is represented, with lift capacities from 2.5 to 1,000 tonnes. In volume terms the majority of repairs the company carries out are on lattice and telescopic booms on mobile cranes, dating from 2005 models all the way back to 1930. The majority of the company's work involves the replacement of structural elements for boom lattices and either manufacturing new parts, or delivering from stock, from connections to top pieces, to breeches and jibs. Avezaat also repairs, and manufactures parts, for telescopic booms.

Another Dutch company, Rusch Crane Repair, specializes in repairing telescopic and lattice booms. The company uses an ultrasonic impact treatment (UIT) technique, developed in Russia





**A lattice boom section awaiting repair in Avezaat's Dutch facility**

and further refined in the US, to increase the fatigue strength of booms by up to 800%. Both repaired and new booms have to be 'directed'. This directioning (forcing into shape) results in internal tensile stresses that not only shorten the lifespan of the boom but also limit the maximum load. The company claims the UIT converts the tensile stress into a moderate compression stress, thus increasing the fatigue strength.

**Work at the factory**

Where manufacturers are concerned, the bulk of refurbishment and repair is carried out on trade-ins. In Liebherr's case, work on used equipment

**Rusch Crane Repair welders working on a telescopic boom repair**



**A new Millennium**

Lampson Australia runs what it says is the largest fleet of Manitowoc cranes (156 units) outside the US. In 2000 it embarked on its Millennium-series programme of fleet refurbishment, with the aim of bringing the cranes in its fleet up to the standard of new units.

The reason behind the programme is simple. The company studied the capacity charts of available cranes around the world and its riggers said that the stability of old machines was better than that offered by new ones.

Manitowoc's venerable 4100 lattice boom model is the subject of many of the Millennium-series rebuilds. In addition to extending the useful service life of the cranes, changes are made to improve operation, assembly and disassembly. The design has been modified to make transport easier while maintenance remains the same as for the standard unit. A hydraulic self-load, unload and erection system is installed as is an automatic braking system.

The old controls are replaced with a two-joystick system, and an in-house designed stability monitor is also fitted. Fibreglass body panels replace steel ones, and other non-structural steel components, including catwalks, tinware and struts, are replaced with stainless steel components.

To date, Lampson has completed upgrades on 11 Model 4100s, two 3900s and three 4600s in its fleet. The plan is to rebuild machines every five years. The company is doing 10 rebuilds a year, on all types of crane.

**Stainless steel is used to replace non-structural steel parts on Lampson's Manitowoc cranes as part of the refurbishment programme**



ranges from just a workshop inspection through to full reconditioning with warranty. The company has workshops in Erlangen, Oberhausen and Alt-Bork in Germany, while subsidiary companies in other countries also have their own repair facilities (the latest in Dubai and Houston, Texas).

When carrying out a full overhaul, all crane assemblies are overhauled or replaced with new or rebuilt parts, with inspection and testing carried out as it would be for a new crane, the company says. Work can also include repainting, new logos and new tyres. At the time of writing Liebherr had few used cranes in stock due to strong demand.

Tadano Faun also runs a dedicated refurbishment and repair workshop that can handle all levels of work, from inspection through total rebuild, selling trade-ins from its home German market around the world, with heavy demand currently being experienced from the Middle East. Machines can vary from 2 to 15 years old, and are supplied with warranties for all new parts, the work carried out and, in some cases, the full crane, depending on age.



**A typical refurbished Tadano RTF 40-4 ready for its new owner**

### On the water

Cranes working on fixed offshore oil and gas installations are frequently refurbished and upgraded, particularly in the North Sea oil fields. Once again, service life extension is the name of the game. Many oil fields are operating well beyond their original expected extraction life as techniques have improved and economic factors make continued operation more viable.

In most cases, cost dictates that refurbishment is chosen over replacement. Down time on the installation and the cost of hiring a floating crane to remove the old unit and replace it with the new one have to be taken into account, added to the cost of the new unit itself.

Liebherr's offshore crane division recently completed upgrades on 20 cranes on a North Sea oil complex. Typical of the type of work it does is the recent overhaul of a BOS 125/1250, built in 1984 for SBM Installer SA and fitted to a diving support vessel operating off the Congo, Africa. The crane was fully overhauled, including fitting a new operator cab with noise protection and additional air conditioning, installation of a CANbus control system and a new 400 kW Liebherr V8 engine. The boom was dismantled, shot blasted, repainted and then reassembled. Finally, the winches were overhauled.

Whether a mobile, tower or offshore unit, there is no doubt that refurbished and repaired cranes can offer an opportunity for lifting at reduced cost, and a greater return on the initial investment through a longer service life. ■

**Offshore cranes are frequently refurbished, such as this Liebherr BOS 125/1250, fitted to a diving support vessel that was recently upgraded**



## All in the look

Refurbishment is not just about the physical – it is often to do with aesthetics. The visual appearance of equipment, especially in the rental sector, can be an important factor, with faded, aged paintwork creating a negative impression in the customer's mind, as well as impacting on the resale value of equipment. While repainting can and often is carried out as part of refurbishment, there is an alternative treatment.

Dakota Shine is used to restore the colour, lustre and value to faded and oxidised surfaces like paint, decals, plastics and more. It is a ready-to-use product that requires no mixing. It consists of agricultural by-products and other proprietary ingredients; and contains no silicones. These ingredients are designed to penetrate the surface to rejuvenate the pigments to their original, as-new appearance.

Launched in 2002, Dakota Shine has been used in 23 countries around the world. According to Dakota AG Innovations' director of finance and operations, Eric Christensen, "Most of the equipment in the industry is built to last, but can weather faster under certain conditions. But in most cases, the paint fades on 90% of the surfaces that do not get scratched off. Most crane bodies do not have a scratch on them, but the paint is faded and starts to look bad. This is where Dakota Shine comes in... we can take that faded and oxidised piece of equipment that still has good paint, but needs its colour and lustre restored, and make it look like new."

Christensen says auctioneers, dealers and rental companies have reported that they see 15-20% in additional sales revenue when selling equipment that has been treated with the product, quite apart from the fact that the look of the equipment is improved, allowing customers to retain older equipment that still looks good in their fleets.

Dakota Shine can be used on a range of surfaces to restore appearance, including painted surfaces, decals and vinyl lettering, plastics and fibreglass.



**Dakota Shine can bring the colour and lustre of old paintwork back to life**



**Fitted with a new cab, this refurbished Liebherr BOS 400/6500 is good for years more service**

