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A history of Simon Engineering, the development of the powered access industry and a lifetime as an engineer, by Denis Ashworth

Ashworth was a keen engineer and from an early age found himself in at the very start of the modern powered access industry.

His book is an unusual combination of autobiography and history of Simon Engineering Dudley, a pioneer of the powered access industry and at one time, the world's largest manufacturer of aerial lifts.

The coffee table sized book, is highly readable and includes around 150 photographs and drawings from the very beginning of the industry. It is a 'must read' for anyone who is interested in powered access, the hydraulic equipment industry or in comparing modern day engineering challenges with those of an entirely different era.

The book is available direct from the publishers at £19.50, plus £4.50 postage and packing.

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Different ways of moving



The method of moving a piece of equipment or a big component to its place of work or installation point can be as important or challenging as the work itself. We take a look at a variety of solutions and ideas from load planning to products such as trailers and skidding systems.

One of the major problems for crane and transport companies around the world is the increasingly strict road and bridge weight restrictions that are coming into force. Many crane manufacturers have introduced models with lower axle weights in order to comply with the varying regulations which can vary not only from country to country but also between regions within a country.

North Rhine Westphalia in Germany is a case in point. It is clamping down on mobile cranes weighing more than 60 tonnes by restricting certain road and bridge capacities which is leading to cranes having to take major detours when travelling to site. To help overcome this crane rental company Colonia Spezialfahrzeuge worked with Manitowoc Crane group to develop a modified 300 tonne six axle Grove GMK6300L-1, aimed at making it easier to obtain transport permits.

Colonia wanted to be able to quickly reduce the crane's minimum travel

weight when necessary by using a quick removal system for its 80 metre boom and lift cylinders but without requiring an assist crane.

The assembly and transport trailer for the boom and lift cylinder was designed to eliminate overhang on the road and so are attached to a set of sliding rails that make it easy for the boom to slide from the crane onto the trailer and visa versa, without manual effort or the need for an assist crane. The solution also includes a system for quickly and easily removing and reinstalling the rear outrigger boxes, both of which is now said to take no more than 10 minutes.

The total weight of the trailer loaded with the main boom and lift cylinder is less than 59 tonnes and by removing the boom and lift cylinder, the weight of the crane is reduced to less than 40 tonnes with axle weights below seven tonnes which is also beneficial in other countries with roading restrictions such as Norway, Canada and the USA.



Manitowoc has designed a new transport system to tackle Germany's increasing road weight restrictions



One screen of the NoVAB Vehicle Axle Load Calculation programme.

Calculating axle load

When carrying a load in a truck or on a trailer, it is often difficult to calculate the optimum position to prevent exceeding maximum axle loads. One solution is the Vehicle Axle Load Calculation programme - NoVAB - which Nooteboom launched more than 20 years ago and has recently been updated. It calculates the optimum position of the load on the specific vehicle combinations. The programme includes a wide range of predefined vehicles including trucks, tractors, drawbar trailers and semi trailers and if required, the details can be adapted, or alternatively totally different configurations added. The same applies when selecting the load.

Using the information, the programme calculates both the axle loads and the best possible axle load distribution. The latest generation NoVAB - Nooteboom 3.0 Cloud - has several improvements and advantages and is quicker and easier to use. Being web based, the software is automatically updated and is accessible on a desktop, laptop, tablet and smartphone and is available in seven European languages.

The optimal load position - to avoid exceeding maximum axle loads for the vehicle, and whether the complete combination complies with the rules that apply within a

specific country - is then calculated. Users can also specify whether one or more axles are to be lifted. The programme then generates a drawing of the general arrangement with all the relevant axle load details and other important parameters. This can be extremely helpful when applying for an exemption and can be used to instruct the driver where to position the load on the trailer.

Super Grid transformer

Girder frame trailers are an increasingly popular method of transporting large loads such as electrical transformers with some carrying loads of up to 600 tonnes. UK-based Collett & Sons completed its third girder bridge project for the National Grid in a four week period during last summer.

The delivery of the Super Grid transformer to Willenhall Substation meant loading the 170 tonne transformer in its girder bridge trailer and then completing an 89 mile overnight journey. Measuring 66 metres long, 5.3 metres wide and 4.8 metres high it completed the 74 mile first leg under Police rolling escort involving forces from three counties from the Port of Ellesmere through Chester, Northwich, Stoke-on-Trent and Stafford before pulling into an abnormal load layby at Penkridge.

The load and trailer combination then waited until the early hours of



Collett had already removed any street furniture which might have impeded the loads passage

The transformer is unloaded onto a six axle SPMT



Being moved into its final position



Sunday morning before continuing, minimising disruption and impact for other road users in the more populated areas. Working with local councils Collett had already removed any street furniture, which might have impeded the loads passage, using its specialist swept path analysis reports.

Due to the restricted access to the Substation, Collett had to unload the transformer from the girder bridge onto a six axle Self Propelled Modular Transporter. Once the transformer was on board the SPMT was hydraulically lowered, allowing it to be driven on to the site and manoeuvred into a storage position, the SPMT was then raised to a height that allowed support stools to be placed underneath the transformer, so that it could be lowered onto them. The transformer was moved to its final location using a jacking and skidding system.

Mammoet moves historic building

Mammoet recently moved a

175 tonne steel building frame almost 40 metres as part of the Pier 70 regeneration project in San Francisco. The frame was transported to a temporary storage location where it will be housed while the historic pier undergoes renovation. Originally the plan was to cut the building into pieces before moving them. However, Mammoet proposed moving it in one piece in order to save time with cutting and reassembling, while minimising the risk of working at height.

The building frame was jacked up 180mm and placed onto 16 Holland Dollies for the structure and six dollies for the bracing - Holland Dollies were used because of their ease of alignment and operation. The building was then pushed a distance of 37 metres using two excavators. Once the pier renovations are complete, the building will be rolled back into position but raised about three metres higher. The renovated Pier 70 Waterfront Site will feature new affordable housing, waterfront



The Addrive made light work of every uphill and downhill section of the route in Mexico

parks, space for artists and local manufacturing, and rehabilitated historic buildings.

Thirteen gas turbines through Mexico

A total of 13 gas turbines each weighing between 186 and 289 tonnes were transported 1,100km through Mexico by heavy haulage specialist Transportes Muciño, using a combination of the Goldhofer Faktor 5 high girder bridge trailer and an Addrive driven heavy-duty modular trailer. The turbines were required for the construction of three power plants including new El Carmen combined cycle power plant in Nuevo Leon.

Most of the 1,100km travelled was on good roads, but challenges included bridge crossings, the climb into the mountains of Ciudad Victoria and the steep descent to Saltillo. Frequent use was made of the Bluetooth synchronisation feature on the Addrive for

coordination with the tractor at travel speeds of up to 15 kph. Goldhofer's switchable auxiliary drive provided the necessary additional traction on critical passages. It also made it possible to cross bridges without using tractors in order to reduce the overall weight.

As a result, the rig - which measured 95 metres long by 6.84 metres wide and around 5.3 metres high - reached the power plants free of any disruption and on schedule.

"In view of the confined space on the power plant sites we replaced the tractor with the Addrive which gave us the manoeuvrability we needed to achieve precise positioning," said Raul Cuevas, director of Transportes Muciño. "As a result, each individual gas turbine was delivered exactly to the specific unloading point and the entire project was completed on schedule."

Frame was jacked up 180mm and placed onto 16 Holland Dollies for the structure and six dollies for the bracing



The 175 tonne steel building frame was moved almost 40 metres as part of the Pier 70 regeneration project in San Francisco



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Record pressure vessels moved

Italian engineering company Fagioli moved two hydrocracking reactors weighing more than 3,000 tonnes from manufacturer ATB Riva Calzoni's facilities in Roncadelle and Venice to the port of Marghera near Venice. From there the units were shipped to Dangote Refining's first private refinery in Nigeria. Each 60 metres long pressure vessel weighed 1,535 tonnes and are among the largest ever produced for the petrochemical sector. It is also the biggest project ever carried out

within the port.

Because of the weight and load restrictions Fagioli used a combination of 72 axle lines of Cometto's 40 tonne capacity MSPE 40t self propelled electronic modules in two units each measuring more than 60 metres long, 8.5 metres wide and 10 metres high.

New Goldhofer trailers

Goldhofer has recently launched two new trailers - the Arcus PK and the Allrounder.

The Arcus PK has a new steering system combining friction steered



The new Arcus PK at its launch at the IAA show

and force steered pendular axles. The unit also includes easier handling of the front bogie which can be quickly loaded onto the rear deck when running unladen. Goldhofer claims the Arcus is one of the lightest vehicles in its class, it has a low loading height of 790mm, and can handle high cargos weighing up to 130 tonnes.

Goldhofer introduced its three axle STN-L 3 low loader semi trailer last summer and has now added the Allrounder which has new features including an automatic variable load lift axle for reduced wear when running empty or with light loads, wheel or track recesses allowing a reduced load height for equipment and a fully automatic ramp lock. Deck length is 8.7 to 9.35 metres with an overall width of 2.55 metres.

Changing out a 500 tonne converter

Canadian company Myshak Crane & Rigging used its Hydra-Slide hydraulic skidding equipment to change out a 514 tonne horizontal converter for a larger 520 tonne unit at a fertiliser production plant in Alberta. The main challenges at the confined site were congestion and ground pressure limitations. Installing the new unit involved the use of Myshak's 272 tonne capacity heavy track HT300 and 317 tonne low profile LP350 hydraulic skidding systems, complete with more than 60 metres of track. Hydra-Slide JLS250 jacking load shoes were used, while the hydraulic power for the six double acting cylinders came from a Hydra-Pac synchronous unit. The new converter was delivered by rail, with Myshak unloading it

Each 60 metres long pressure vessel weighed 1,535 tonnes



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Six JLS250 jacking load shoes were hydraulically connected in three point suspension to lift and slide two converters on the HT300 system



The old converter shell was jacked up and skidded horizontally in one piece more than 50 metres

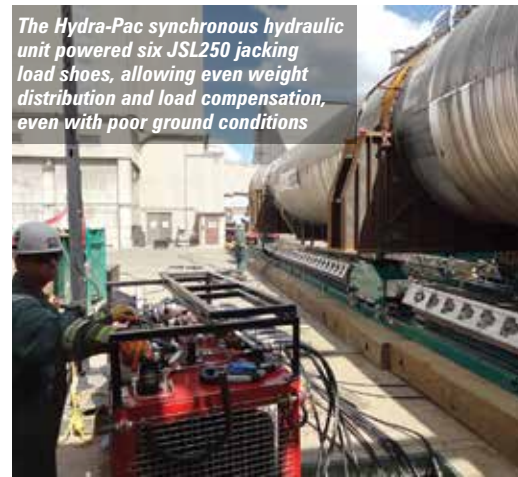
with the HT300 skid system and placing it into storage until the plant shutdown. It then removed the old converter and a spare basket from site to make room for the new installation. The new converter basket was moved from storage to the plant to be filled with a catalyst prior to installation.

The old converter shell, basket and catalyst weighed 514.5 tonnes was 32 metres long and 2.7 metres in diameter. It was jacked up and skidded horizontally more than 50 metres to an open area using the

JLS250 skid shoes and HT300 skid track. It was then loaded onto a Self Propelled Modular Transporter.

The new converter shell was 35 metres long, three metres in diameter and weighed 520.2 tonnes with the basket. It was then skidded 50 metres into position and lowered onto the retaining anchor bolts. The six JLS250 jacking load shoes were hydraulically connected in a three point suspension to lift and slide the converters on the HT300 track. The shoes are a universal design and can be connected hydraulically with any number of other shoes increasing the total system capacity while maintaining equal load support and weight distribution. At one point there was only 50mm of clearance requiring the converter to be leant over to give adequate clearance down one side.

The Hydra-Pac synchronous hydraulic unit powered six JSL250 jacking load shoes, allowing even weight distribution and load compensation, even with poor ground conditions



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