

# The world’s biggest reach stackers

With a SWL of 155t @ 1,850mm load centre (LC), the VRS-K machines (called VRS 0155 by CS Wind) are the biggest reach stackers yet built by CES, or anyone else. They set a new world record for this handling concept. CES has an even bigger model in its design portfolio (CRS-L, 250t

*The official handover with Robert Huthloff (L) and CS Wind UK’s MD James Won*



## Last month, Germany’s CES officially handed over its first two VRS-K reach stackers to CS Wind UK in Campbeltown, Scotland

@ 1,850mm LC), and believes it could go as high as 500t.

During the official handover in September, guests saw an offshore tower middle section being lifted and transported end-on by the VRS-K machines, fitted with C-hooks, one driving forwards and the other in reverse. The drivers are in radio contact, and CS Wind UK is currently evaluating automatic speed synchronisation systems from different vendors.

The VRS-Ks were supplied through CES’s British distribution and service partner, Shad Group. CS Wind placed the order on 23 December 2016, and the modular design machines were delivered in containers from

Italy, and assembled and commissioned on site by CES engineers on schedule on 14 July.

Originally a Vestas operation, the CS Wind UK plant is now part of Korea-based CS Wind Corporation, which also has production plants in Canada, Indonesia, China, Vietnam and Malaysia.

### Investment boost

Up to now, the Scottish plant has built towers for onshore turbines, but last year it received a major investment boost from Dong Energy, according to which the Danish group gets preferential access to offshore towers from a new facility, the first of its kind in the UK. For 2017, the plant’s

output is around 60% offshore and 40% onshore.

Lesley Black, CS Wind UK’s sales and marketing manager, explains that the company has a contract from Siemens Wind Towers to build 95 towers over the next two years for offshore turbines destined for Dong Energy. There are three sections per tower, so the plant will turn out 285 sections under this contract. For the first project – the Walney extension in the Irish Sea – the sections weigh between 108t and 156t (see table).

Handling equipment on the onshore tower side includes two Hyster reach stackers – a 50-tonner and a 70-tonner – but, clearly, something much bigger was needed for the new offshore work. Initially, CS Wind UK considered acquiring two heavy-duty crawler cranes, with a SPMT for the ground transport.

However, according to Peter Doggett, Shad’s managing director, the price for these three pieces



Starting to turn the corner with a 26.6m-long section weighing 108t

es would have been substantially higher than that of the two reach stackers. In addition, as ‘pick and carry’ machines, the reach stackers provide faster cycling. They are more manoeuvrable, and require less maintenance, taking also into account the maintenance associated with multi-axle line SPMTs.

### From the side

Wide track crawlers and SPMTs exert low ground pressure, and CES had to guarantee a ground pressure of <980 kPa (<10 kg/cm<sup>2</sup>) in ‘worst case’ scenarios, such as when turning during ‘end-on’ travel, and when tower sections are lifted from the transversal position (using hook-suspended slings), as this clearly involves a bigger LC. In the case of transversal lifting, this could be 4m – half the tower’s 6m diameter plus 1m clearance in front of the tyres, say to allow for oscillations when accelerating or braking.

Transversal lifting is required to load the trailers that will take the towers to the port for shipment (see below). Capacity of the VRS-Ks is 104t at 4m LC, sufficient for two machines to transversally lift and carry 7m-wide sections weighing up to 200t at 0.5m clearance. In practice, capacity would be higher, as the load could be boomed-in so it is lifted above the tyres.

Low ground pressure is achieved through:

- A fabricated wide front axle, fitted with large wheels shod with huge (27.00–49) tyres.
- Independent wheel suspension.
- CES’s unique hydraulically extendable wheelbase (WB), from 9m to 12m. This lengthens the lever arm as the counterweight is pushed back, relieving the load on the front tyres.

### Air and water

Robert Huthloff, technical consultant of CES GmbH, and managing director of the Italian production affiliate CES Italia Srl, told *WorldCargo News* that, for improved traction and added safety in the event of a blowout, the tyres are filled with a mix of 60% water and 40% air, pressurised to 10 bar. This was recommended by the tyre manufacturer, Italy’s Saccon Gomme, which builds its Eomega industrial tyres in Malaysia. The steer axle tyres (24.00–35) have the same mix.

The water contains antifreeze to prevent the mix freezing at –20 degC. Such a low temperature would be rare in Campbeltown, in the Kintyre Peninsula, but is a possibility, so all precautions have been taken.

For their size and lifting power, the machines are fitted with relatively small 8-litre engines, the Volvo TAD873VE Stage IV, rated at 235 kW/320 hp, with torque of 1,424 Nm at 1,500 rpm – re-

ducing noise as well as fuel consumption. Low noise also results from side-mounting the clip-on “energy box” (engine, radiator, hydraulic pumps and oil), avoiding internal resonance, or what Robert Huthloff calls the “violon box” effect. In-cab noise level is ≤68 dBA. The machines have hydrostatic drive with pumps for the lift cylinders and the Rexroth wheel motors. Drive sensing software allows the drive to two wheels to be cut when the machines are travelling empty.

At regime, each VRS-K will be operating 30–40 hours per week (1,500–2,000 hours a year), which is intensive for equipment such as this. The Hyster reach stackers on the onshore side can run for up to 90 hours per week.

### On the road

CS Wind UK’s contractor for road haulage is heavy haul specialist ALE, whose communications manager, Sarah Maia, told *WorldCargo News* that new generation widening trailers, introduced last year, will be used to transport the sections to Campbeltown Port, just five miles away. These trailers, specially built for ALE by Goldhofer, open out to 4.3m width when loaded, distributing the load more effectively, and reducing the imposed ground pressure.

The transports will take place when CS Wind is informed a ship is due, starting in January. The heavy lift ships will be chartered by Siemens. It is thought that the sections will be taken to the Port of Hull, where Siemens is manufacturing nacelles and blades.

ALE may transport one section per trip, or three in one trip, on a case-by-case basis, depending on all the circumstances. Either way, clearly, the A283 road has to be closed for a period, and permits have to be obtained by ALE.

“When the date for the ship is known,” said Lesley Black, “the most efficient and least disruptive timing will be planned, taking into account weather conditions, local activities, and so on. All agencies will try to minimise impact to the local community, and, for this reason, night time movements are very likely.”

### Many enquiries

CES Group’s managing director, Nicholas Huthloff, says that enquiries for big reach stackers are coming in from all over the world, and there are immediate prospects in South Africa and South America. These demonstrate that there are many heavy cargo applications, simply by changing the front end attachments. The 100% modularity of the design means that machines can be transported from the CES Italia manufacturing plant near Verona in standard containers or trailers, so no special transports are required. □

Wind towers for Walney extension project

Section	Length	Weight	Lower ø	Upper ø
Top	36m	156t	6m	4.145m
Middle	26.6m	108t	6m	6m
Bottom	19.6m	126t	6m	6m

Notes: ø = diameter. Source: CS Wind UK