

Turbine towers

British manufacturing and engineering are on the mend. Alan Fitzpatrick reports from a site in Wales that is capitalising on the rush for wind power



Above and below:
the Mabey Bridge
turbine towers
production plant

As UK manufacturing rises resolute from recession, it is encouraging to see one heavy engineering company, steeped in history, reinventing itself, investing in plant and creating new jobs, with its eye firmly on the high growth area of renewable energy. That company is Mabey Bridge, famous for its Bailey bridges, now known as panel bridges, which saw action most recently in Cockermouth, following last year's floods, and at the Longannet power station, when the site's coal conveyors collapsed.

£150 million turnover Mabey Bridge is privately held and has been in existence since 1849. Aside from building modular steel bridges, it also manufactures foundation-less car parks and heavy plated steelwork. However, two years ago, the directors decided to play to their strengths in steel plate manufacture and welding, and expand into the construction of wind turbine towers.

Hence the firm's purchase of a large warehouse site, just off the Severn Bridge in Chepstow – recently the subject of a visit by the European Wind Turbine Committee, with members from the insurance industry and engineers from the SOE (Society of Operations Engineers). And it is impressive stuff, with the visiting delegation, last month, witnessing early stage fabrication of 100 tonne turbine towers for Repower (the European wind turbine manufacturer, with some 4% of the world market), designed to support 2MW turbines.

In fact, the company has a goal of producing 300 wind turbine towers per year, each up to 120m in length, with production working 24/7 and providing employment for 240. Making that happen has required an investment of £38 million in plant and machinery, including specialist bending, cutting and welding equipment.

Advanced cutting

Running through the processes, SS355 steel plate is purchased in thicknesses ranging from 42 to 10mm, from the Tata steel mills in Scunthorpe, and transported to the Chepstow plant. There the plate is checked for compliance to design specifications, in terms, for example, of carbon content, but also absence of laminations. Following acceptance, the first part of the process involves shot blasting to clean up the plate, after which it is moved to the cutting bay.

Mabey Bridge's new cutting machine is the first in the UK to use a three cutting-torch system, which is capable of cutting steel plate to the required dimensions, with welded preparations, at much




higher speeds than conventional single torch equipment. With cutting complete, prepared steel plate moves to the rolling area, where a 180 tonne hydraulic press rolls it into a circular pattern, ready for welding on an automated machine to create the huge tower sections, known as cans.

Following non-destructive testing on 20% of all site welds are, to ensure quality, a bolting ring, imported from Germany, is welded to the bottom can of the wind tower. The cans are then ready for build-up into turbine towers, up to 80m in length for the current order from Repower, before being shot blasted again and then painted to the customer's colour. Each part of the manufacturing process is controlled to best practice quality assurance standards.

Completed towers – with internal fittings including electrical cabling, ladders and access platforms – are then ready for delivery. Mabey Bridge explains that pre-fitting all internal components enables the towers to be installed on site, using the 'plug and play' approach. This saves the installer time during assembly, which is particularly important, given that wind farms are, by design, windy places, creating challenges for large mobile cranes with heavy loads.

Mabey Bridge production is certified by the



turbine manufacturers, using their designs, which comply with wind industry codes. The design is certified by TUV of Germany. The company itself also has certification under ISO 9001, 14001 and 18001. When the plant is in full production, it will take 10 days from receipt of an order to a wind tower being ready for transport to site. 

Fabricated turbine towers nearing completion

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