



News release: for immediate release with accompanying photos
Subject: Local engineering firm completes big overseas project
Company involved: Vector Lifting, Jandakot, WA
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Perth engineering firm completes major Taiwan rail project.

Vector Lifting, in a joint venture partnership with Taiwanese companies, China Steel Machinery Company and Teco Industries, has recently completed its largest and most ambitious project since inception in 1974.

Over the past three years, the West Australian-based railway engineering company has supplied a number of items of maintenance equipment for the Taiwan High Speed Rail Corporation. This equipment ranged from simple bogie stands to a state-of-the-art underfloor lifting system and included a bogie drop table; bogie load test system; disassembly hoist; mobile jacks; bogie and wheel set turntables, and wheel set and axle rotating devices.

Well known in Australia for similar engineering projects, this has been the first international, and by far the most challenging railway project undertaken by the company.

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Les Capelli, Vector Lifting Managing Director said this has been a significant venture for the company that had required the establishment of an additional specialist design and administration office dedicated to this one project, in addition to the project management office set up in Taiwan.

Taiwan's high speed railway has been one of the largest construction projects of the late 20 Century. With an original cost estimate of some 13 billion US dollars, the electrified high-speed line connects the major cities of Taipei in the North and Kaohsiung in the South, a distance of 345 kilometres. The new rail line cuts the journey-time from four hours to just ninety minutes. Around 300 kilometres of the track is built on viaducts or in tunnels.

Taiwan has a high incidence of earthquakes and all elements of the supplied equipment were designed to withstand a significant earthquake.

The underfloor lifting system (ULS) is located in the main maintenance depot at ~~Cyber~~ and is the centre-piece of the equipment supplied by Vector Lifting. It is capable of lifting a complete twelve-car, 300 metre long electric multiple unit (EMU) train set weighing over 700 tonnes.

The cantilevered lifting system provides enough lift to enable bogies to pass under the raised railcar bodies along the full length of the track. This operation is carried out on the single ULS track without the need of intermediate turntables or an adjacent track. Up to twenty-four bogey sets can be replaced simultaneously.

Besides being able to lift a complete EMU train set, the ULS can be configured to lift a combination of individual railcars as well as groups of railcars. For example, operators can lift six individual railcars or four individual railcars and a group of three. A number of different combination lifts are available. When lifting the whole train set, the ULS is controlled from a

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central main control console. In addition, twelve local control consoles are available for use when lifting different combinations of railcars.

The actual ULS comprises twenty-four individual hoisting systems each with four lifting screw spindles. A Programmable Logic Controller (PLC) ensures the accurate synchronisation of all ninety-six spindles in order to maintain an even lift. The PLC programming is made even more complex because of the various combinations of lifts that can be selected.

In order to maintain a safer working environment, the hoists are all concealed below ground when the system is not in use.

As with any project of this scale, an enormous amount of documentation was provided to the client. Vector Lifting produced all the technical and training documentation for the railway operators, maintenance and repair staff, as well as running the training courses. All the documentation was produced in English however the operation and maintenance manuals were required in both English and Chinese. A technical writer in Perth wrote the original copy which was then sent to the Taiwan office for translation.

Some ten operation and maintenance manuals, as well as ten training packages were written, translated and printed over an eighteen month period.

Like every project, the whole of Vector Lifting's involvement in the project was undertaken with a commitment to Quality Assurance and this played a large part in the successful outcome of the joint venture project.

"Projects of this nature and complexity don't get awarded to WA firms that often" commented Les Capelli.

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“Our reputation globally as specialist railway lifting engineering experts has certainly been enhanced with the completion and successful commissioning of this Taiwan high speed rail job. It has attracted world interest and acclaim for its innovative features” he added.

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