

Making locos like motorcars speeds local builds

Steel Australia editor, ALAN MARSHALL reports how canny use of Australian steel is keeping this traditional form of transport at the freight forefront.

You can't get much more steel-oriented than railways, but it may surprise some that this engine of the Industrial Revolution is still making great headway here in getting those steel wheels on steel rails faster and more efficiently.

The latest development from this quarter involves transport and logistics operator QR's intermodal business recently awarding United Group Limited's UGL Rail division a \$78 million order for 12 new diesel electric locomotives.

The new locos are mainly to be used to haul containerised freight on the standard gauge

line between Melbourne and Perth, and all are to be delivered to the rail operator this year.

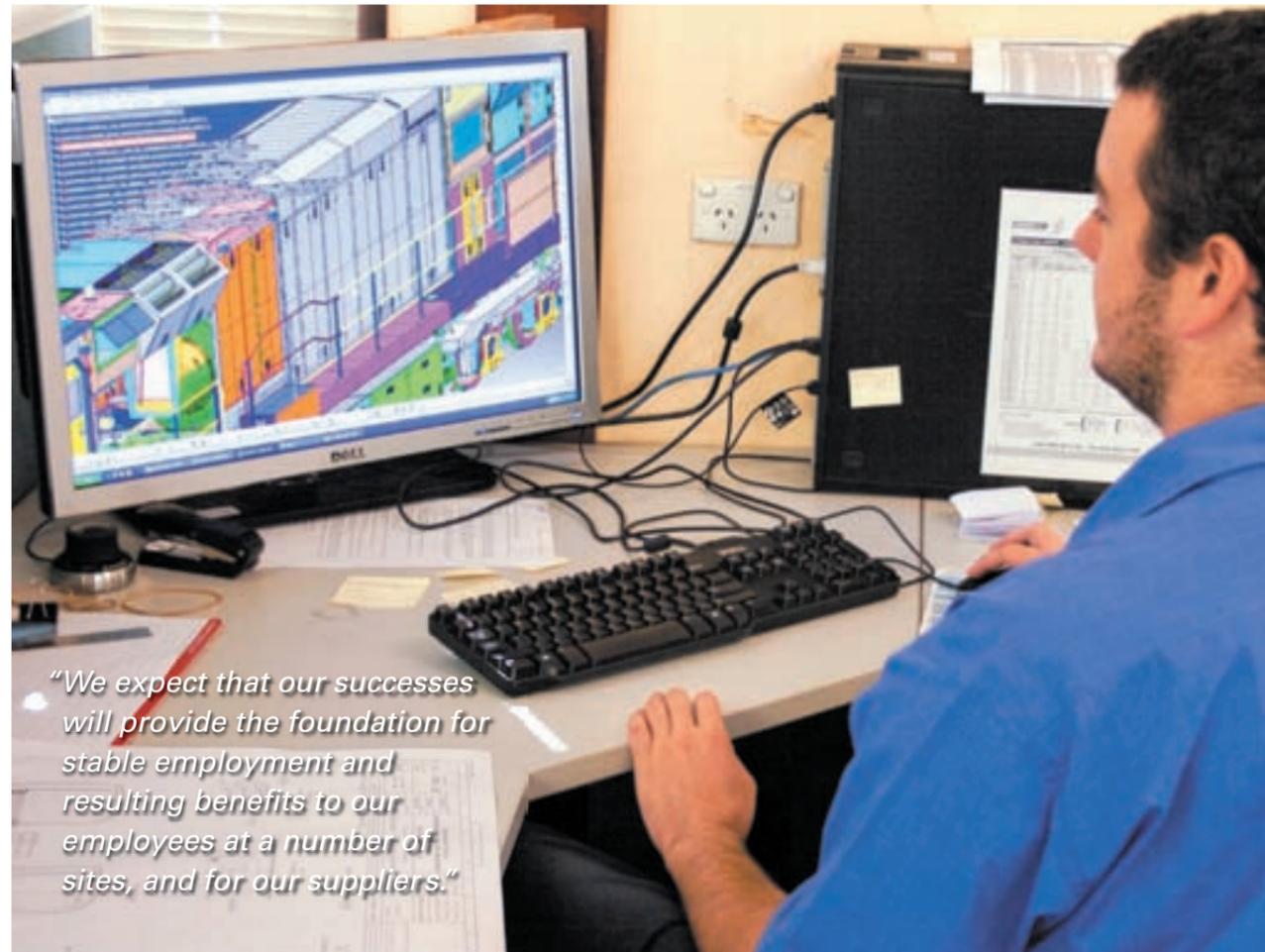
The new locomotives will be delivered from UGL Rail's Broadmeadow plant in Newcastle between July and December with most of the steel fabrication work occurring at its Taree plant on NSW's mid North Coast. The contract includes an option for QR (formerly Queensland Rail) to purchase six more locomotives.

It's a tall order but one the company is meeting by streamlining the way it manufactures rail rolling stock through restructuring its operations from the traditional deployment of dedicated end-to-end teams to a work flow model more associated with mass production.

The job requires mostly standard 350 grade XLERPLATE® steel from BlueScope Steel and the locomotives are powered by 4300hp engines from General Electric which has an ongoing supply alliance with UGL.

Each locomotive has approximately 43 tonnes of locally produced steel in its structure, bogies and cabs. This steel is fabricated from sheet plate and steel sections to provide maximum strength and fatigue life while keeping the mass to a minimum.

UGL Rail Product Manager Locomotives, **David McCabe** said that it has been hectic over the past 12 months but that the task has been made more manageable by designing locomotives quicker and at lower cost through organising plant personnel into more specialised units.



"We expect that our successes will provide the foundation for stable employment and resulting benefits to our employees at a number of sites, and for our suppliers."

David Andrew using Catia V5 software to design the QR locomotive.

"For instance, there are guys based at one dedicated work station installing engines, then guys at the next station along the line installing compressors."

Project Manager for the project, **John Holliday** said that the company aims to produce locomotives in minimum time to help customers meet to market demands quickly.

"Currently we are achieving assembly times that are almost half of traditional times of two years ago," he said.

He said that this is mainly achieved through standardisation, taking advantage of efficiencies starting from the designing stage and conducting works concurrently at several sites.

"Standardised design simplifies parts procurement for a shorter supply cycle, allows supplier partnering around standard parts and products and benefits personnel in production by reducing variation in documentation which allows training to be more focused and variability to be reduced," Mr Holliday said.

"Standardisation has allowed us to procure on shorter lead times from local suppliers of steel fabricated parts and to develop relationships with local suppliers to obtain benefits from Computer Aided Manufacturing (CAM)."

Production processes themselves have also been established to facilitate faster production by feeding prebuilt sub-assemblies to the main assembly line.

"Lean manufacturing principles have been employed and are being refined to increase the rate of assembly, improve quality and reduce costs," he said.

"We stress the benefits of design for manufacturing and have achieved reductions in time and cost resulting from these design initiatives.

"We have also engaged the abilities of the wider UGL community and subassemblies are now and will increasingly be produced at various UGL rail facilities, such as is happening at Taree and Goulburn where specialised fabrication and fit-out is being extended and personnel trained.

Operations Manager for UGL Rail's Taree plant, **Andrew Wearne** said his plant carries out all manufacturing process, including processing of raw material, machining, fabrication, blasting and painting, fitting and assembly.

The locomotive platforms are produced in a modular form for ease of manufacture and onsite logistics. They are then brought together to form the assembled platform.



United Group Rail's Broadmeadow facility from where the new diesel electric locomotives will be delivered.

"We have three robotic welding systems at Taree which produce the smaller sub-assemblies. In addition to the robots, we have a semi-automated welding process which all adds to our manufacturing flexibility and improved workflow efficiencies," Mr Wearne said.

"Plasma cutting beveling capabilities up to 45 degrees across both axes are used in-house to reduce lead times in our production cycle by eliminating outsourced work."

A special grade of steel plate rated at AS2678 350 Grade, ultrasonically tested to AS1710 is used extensively for making bogies.

"The steel distributor, OneSteel was able to reduce lead times to meet our requirements as required by our customers timing."

Rotating jigs were used for the first time on this project, especially helpful to obtain the correct camber of locomotive platforms.

"We build passenger cars (OScars) and diesel electric locos at Broadmeadow as well as refurbish electric locos for QR," UGL Rail General Manager Project Delivery Systems, **Geoff Webb** said.

"Australian steel is used extensively in all our products although stainless steel is sourced from overseas."

John Holliday said the QR locomotives will have high tractive output of about 4300hp with low mass to enable customers to utilise them in a wide array of applications and on most rail networks whether for short cycle mineral or long trip container haulage.

UGL Rail is currently gearing up to output 50 new locomotives annually.

"We expect that our successes will provide the foundation for stable employment and resulting benefits to our employees at a number of sites, and for our suppliers," Holliday said.

QR Executive General Manager Freight, **Ken Lewsey** said their new rolling stock would improve reliability and availability, increase haulage capacity, reduce fuel and maintenance costs and cut carbon emissions as a result of lower fuel consumption.