Integrated local delivers largest plant unit

ASI member, United Group Resources (UGL Resources) has provided integrated capacities from design onwards to deliver to petroleum company, BP what is believed to be the largest single unit of equipment of its type ever fabricated with steel in Australia.

To achieve this seamlessly, UGL Resources provided engineering design, detailing, supply, fabrication and delivery to site of a new naphtha splitter column to be used by the BP refinery at Kwinana, just south of Perth, to separate hydrocarbons.

Won against international competition, the splitter column job was the largest single vessel UGL Resources has ever fabricated. More than 200 tonnes of 460N grade XLERPLATE® steel from BlueScope Steel was used to fabricate the unit's cylindrical shell and dished ends.

UGL Resources Project Engineer, **Glenn Lemerle** said the vessel had to be made to tight tolerances.

"Designed to AS1210 – Class 2A pressure standard, the unit has to withstand operating temperatures up to 182 degrees Celsius and pressures up to 500kpa, high for a vessel of that volume to maintain its shape without distortion or rupturing," he said.

"The 460N grade steel has a very high tensile strength so we didn't have to perform stress tests or heat relief."

UGL Resources Fabrication Manager, **Julian Bleddyn** said that the project was completed on schedule with zero health and safety recordable injuries and zero quality issues.

"The project was undertaken in 51 weeks, a lot earlier than the planned 68," he said. "It's the complete deal encompassing design right through to delivery."

"Over one kilometre of welding was performed without a single defect and over 17,000 bolt holes made without a single misalignment."

He said that it was one of the first steel projects of its type in Australia to integrate design, detailing, fabrication and final delivery by one commercial entity.

UGL Resources constructed the shell of the vessel in 3m by 4.5m diameter sections in its Kwinana workshop due to the immense size and weight of the column. This modular construction method was used to maximise resources and optimise schedule compliance. The different modules were then welded together in the horizontal plane. The fabrication phase of this project involved 20 employees working two shifts over eight months.

"Fabrication, hydrotesting, painting, insulation and cladding in multiple work fronts at one plant location also meant that the vessel could be transported to site in one piece. The column fitted into the refinery on the first attempt," Mr Bleddyn said.

Transportation of the massive column was a logistical exercise in its own right involving a police escort on its three-kilometre journey to BP's refinery. The journey took five hours as it involved lifting and 'de-energising' numerous power lines to allow the truck with the fully assembled vessel to pass underneath. Civil works were also required to remove and replace traffic islands. It took 28 axles to transport the vessel with each axle moving up to 18 tonnes.

Mr Bleddyn said that the splitter column was the first major project to be delivered under UGL Resources' integrated delivery model. In addition to streamlining delivery for BP, the company now has increased capabilities to deliver similar projects to industry.

"We now have in place factory fabrication equipment for pressure vessels and trained staff for this specialist work which better positions us to take on more of this sort of work," he said.

The 64m high by 4.5m diameter column unit weighs 312 tonnes and involves a very complex interaction of internal process trays, baffles, piping nozzles and external access platforms, ladders and walkways.

The overall length of the main vessel weld seams, including the skirt was approximately 460 metres. Volumetric testing in the form of ultrasonic examination was conducted on approximately 95 metres of this length to determine weld quality.

Internally, the column has been fitted with perforated process trays in ASTM A240 410S stainless steel at about every 450mm interval.

Mr Bleddyn is particularly buoyed that the job was won through a global tendering process.

In March 2007, UGL Resources bid for the splitter column project. BP conducted the tender process utilising global procurement channels.

"There are obvious benefits of doing the job in Australia, especially where quality of work and on-time delivery is crucial," he said.

"If there's a fault, it takes a long time to deliver rectifications from overseas."

UGL Resources provides engineering, design, project management, construction, fabrication, shutdown, and electrical/mechanical services to the Australian and international resources sectors. This includes the mining and mineral processing, chemicals, oil and gas and industrial processing industries.

In Australia, UGL Resources has over 30 years' experience and a workforce of approximately 3000. The company is part of the United Group, a prominent publicly listed (ASX 100) Australian engineering and services provider employing approximately 30,000 people in over 55 countries.

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