

Babcock: fabricating in SA for 25 years

November 2018 marked 25 years for Babcock's fabricating facility as it celebrated providing fabrication and a full range of specialised support services to Africa's power generation and metallurgical industries. David Brook, technical director, explains.

"Babcock had been supplying South Africa's public electricity utility with designs, products and locally fabricated components since the 1970s," begins David Brook. "We had always been highly adept at conceiving, designing and implementing radical solutions; but it became clear at that time that the slowest and most critical aspect of being able to deliver was final manufacture, which was then being done by ICAL (International Combustion of Africa Limited) and other fabricators," he says.

With the dissolving of ICAL in 1993 the opportunity arose for Babcock to establish its own fabrication capability and thus, with some R2.3-million of orders on hand, a team of 10 staff set up shop to complete the projects, and prepared to secure additional orders. The 'jewel in the crown' that Babcock aimed for was to bid and win the design, supply and manufacture of the penthouse headers and manifolds on six boiler units at one of the largest power stations in South Africa.

"Every single person committed to making it work and it did! We cleared the projects we had, got more work out of industry and were awarded the much-coveted bid," recalls Brook.

Since then, Babcock's fabrication division has gone from strength to strength and the company has established itself as a leading South African provider of pressure parts for utility and water tube boilers and steel fabrication, backed by an experienced and fully committed team – some of whom have been with the company since inception.

Based at modern workshop premises in Jet Park, Johannesburg, Babcock's factory undertakes both new boiler projects as well as the manufacture of replacement parts for existing boilers. The workshops are well equipped to deal with high-pressure tubular fabrications and tube manipulations as well as welding and assembly of high-pressure tubular components.

The workshop areas consist of four purpose-built production bays, while an outdoor stockyard and lay down area house the hydrostatic test, spray painting and store facilities. Workshop manager Fernando Nunes is the fabrication facility's longest serving employee, having been with the company almost from day one. His motto is 'We'll make it happen' and he says his team is committed to meeting customer requirements. "We never say no and will do what

it takes to keep our customers happy," says Nunes, adding that their success over the past quarter century has much to do with consistent quality and ready availability. "We are available to our customers 24/7 and will quickly respond to any emergency breakdown."



Babcock recently played a major role in the refurbishment of the three boiler units at a local power station, an extremely successful project that comprised executing more than 22 000 internal butt welds as well as a successful modular economiser replacement and the turbine loop piping replacement.

Other customers include numerous energy users in the petrochemical, chemical, sugar, paper, water, mining and associated process sectors, with pressure pipes, boiler tubes, membrane furnace panels and various other items fabricated to customer requirements and/or designs.

"Our fabrication facility ensures that we have direct control over production and construction activities and that we can complete contracts timeously, even when working under demanding schedules and breakdown conditions," says Nunes. "We strive to deliver quality and our weld repair rate is amongst the lowest in the industry." Babcock is accredited with the International Institute of Welding's (IIW's) ISO 3834 Part 2 comprehensive quality requirements and all welders employed at Babcock's fabrication facility are certified members of the Southern African Institute of Welding (SAIW).

The facility utilises all types of welding including MMA, GTAW, GMAW and

SAW, and any materials from normal carbon steel up to the 1% and 2¼% chrome steels as well as high-temperature, high-strength, creep-resistant steels are used that can withstand the constant load high temperature conditions.

The company boasts a comprehensive inventory of fabrication equipment including tube bending, tube-end forming and bevelling equipment; cutting equipment ranging from mechanical saws through to plasma cutters; large boring, drilling and milling machines; and welding equipment covering almost every process. The four workshop bays are supplied with LPG gas, oxygen, argon and compressed air via piped ring mains.

Nunes says that while the boilers are still manufactured the same way they were 25 years ago, quality upgrades have been carried out over the years at the premises, and there have been advancements in equipment technology, with the company recently investing in a new, fully automatic, CNC bending machine.

The factory has also maintained an impressive safety record over the years, with the most recent accolade awarded to Eugene Penny who was named Safety Officer of the Year for 2018 within Babcock's engineering operations.

Polysoude TIG weld overlay refreshed

A panel of those working in the industry met at Polysoude in Nantes on the 12th and 13th of December 2018 to find out about the latest changes with regards to weld overlay technologies – and the event went a lot further than theoretical presentation of new approaches. The production workshop allowed participants to have a close look at all the new aspects, with live demonstrations.

Weld overlay involves layering an internal or external surface of a base metal using a corrosion-resistant alloy, often Inconel™, thereby increasing the longevity of the part whilst keeping production costs relatively low.

Partners from France and all around the world: customers, component suppliers and interested manufacturers were able to freely exchange knowledge on the progress of this technology, which has established itself over the course of the past decade. One of the first applications of weld overlay was the deposition by welding onto tubes in the petrol and gas industry sectors, where weld overlay technology is now an increasingly favoured solution.

International demand has accelerated to such an extent that equipment production was struggling to keep up. There are a large number of possible weld overlay configurations. Capitalising on years of research and development and equipment sales, Polysoude has developed several solutions and the standardisation of ready-to-assemble machines and subsets that has made it possible to reduce not only lead times but also purchasing costs for the end user.

By analysing the various applications and customer feedback, specific developments have subsequently resulted in substantial improvements. The main aim with these developments was of course to improve productivity.

The basic version of the TIG process is known for welding quality and not for productivity. However, since the demands of the market are increasingly towards reductions in costs and lead times, the question at hand was the rate of deposition needed to cover the inside of a pipe that can measure over 20 m, so that overlay cladding can proceed on a 24/7 basis.

One of the solutions was to replace the single arc process with a dual electrode TIG system with the addition of hot wire to raise the deposition rates. Thanks to this configuration, a deposition rate of up to 6.0 kg/hr can be achieved. Needless to say, the specific deposition rate will depend on the allowable heat input needed to make the filler wire melt and fuse and on the characteristics of the part to be welded.

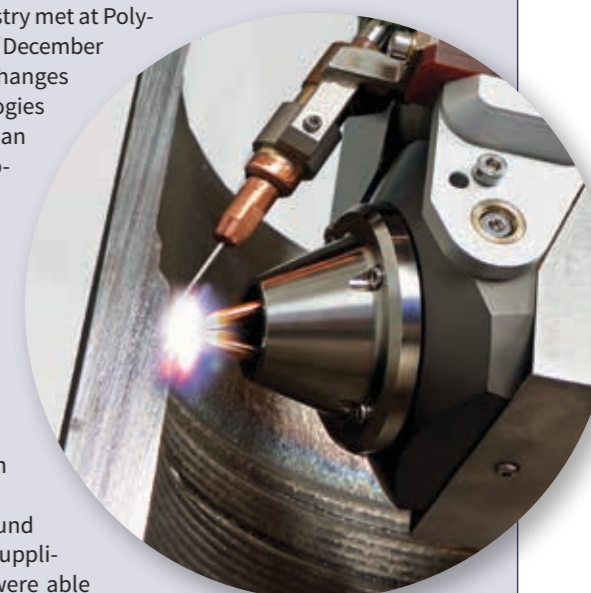
Two welding machines in master-slave mode control the perfect synchronisation of the torches whilst the Polysoude Computer Numerical Control (CNC) synchronises all movements of the arm, positioner and head to control the electrode's position. Specific adjustable torches adapt to the part to be welded, whether it is a tube, a tank, a valve, a pump or any other component of a full installation. All this is overseen by a Wide Dynamic Range fibre optic camera system.

On site, once the deposition welding cycle has been initiated, the welder can manage several production lines. For weld overlay applications of long tubes, the size of the filler wire coils allows for uninterrupted performance of the task.

If a standard complete installation is not planned and after examining the customer's specifications, the Polysoude project managers use the standard catalogue of electromechanical components to make a specific proposal. According to the various functions required for a specific task, they advise on the optimal equipment to meet the customer's requirements. In this way, all lead times are reduced, from the submission of the quote to the completion of the project itself.

Since 2018 Polysoude has had an additional production hall dedicated to the production of large-scale equipment. Anticipating the increase in demand from the market also allows special requirements to be met.

The future is bright for TIG weld overlay welding. ■



Babcock's fabricating facility celebrated 25 years of service to Africa's power generation and metallurgical industries in November last year.