AGS Engineering certified

as structural fabricators

AGS Engineering, the manufacturing arm of construction company August General Servicing (AGS), has become the first South African structural steel fabricator to be certified to ISO 3834 part 3, Quality Requirements for Fusion Welding of Metallic Materials. *African Fusion* talks to Douglas Louw, the company's quality manager and Arthur Teixeira, its materials quality control manager about the company and its quality choices.

AGS was co-founded in 1976 by Georg Brandner, now the sole owner and the current managing director, as a contractor to AECI on the construction of its Ammonia plant in Modderfontein. Over the next 22 years, the company developed extensive expertise through major projects in gas cleaning, piping systems and materials handling.

Notable projects undertaken include: the manufacture, erection, conversion and refurbishment of electrostatic precipitators and bag filters at numerous power stations, cement plants and paper mills; the manufacture and erection of crushing, screening; conveying and transfer systems for collieries, the cement and steel industry; and the erection of heat exchangers, ducting and process piping in the petrochemical industry.

"AGS Engineering, the fabrication arm of the company, originated in 1998 when we took over the Bateman workshop in Tulisa Park and agreed to continue to fabricate for them," Louw tells *African Fusion*. The Tulisa Park workshop facilities consist of 3 000 m^2 under roof, with one 5-ton and one 10-ton overhead crane; all the necessary equipment for cutting, rolling, fabricating and welding of structural materials; an in-house shot blasting and painting facility; and 4 000 m^2 of open lay-down space. The workshop is capable of processing 200 tons of structural steel every month.

In May this year, to accommodate substantial recent and future growth, AGS Engineering acquired a second workshop in Alrode – a 5 000 m^2 covered area with three 5-ton and one 25-ton overhead crane – a facility for fabricating 350 tons of steel per month. The offices on this site were completed in early November, making Alrode the new headquarters for the company's manufacturing and construction activities.

GMAW, using Fronius welding machines with Argoshield 5 gas and Bohler EMK 6 solid welding wire is used for almost all of the welding at AGS Engineering.

"Today we have over 120 employees at AGS Engineering," adds Louw, "not including the servicing site. Here in Alrode we have ten coded welders and three fully qualified boilermakers supported by a further six semi-skilled workers. At Tulisa Park, we have six coded welders supported by ten boilermakers, assembling the cut-to-size parts from the drawings before passing the work onto the welders," he adds.

We ask about the expansion: "We have just been awarded a big one," responds Louw, "the fabrication and installation of the bag filter units for Medupi and Kusile power stations. This will make up 80% of our workload for the next five to six years. It is the reason why we are sitting here now in this new Alrode workshop," he tells *African Fusion*.

These bag filter units are pulse jet fabric filters, each consisting of two casings 47 m long by 18 m square. Each consists of 14 hoppers to channel the collected fly-ash to the conveyor below. The filters are supported by a structure 27 m above the ground and the bag filters hang on tubular support structures. "The flue-gas from the boiler is ducted into the fully sealed casing and through the bags. The bags collect the fly-ash which is then pulsed off and down through the hoppers where it is collected on the ground and conveyed away to the ash dumps," Louw explains. The units are supported by a freestanding structure with ducting to connect into the boiler.

Fabrication involves: the base sup-

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ports and under-structure, made up of rolled I-beam sections; the five-ton hoppers, which have a six metre square opening at the top and are around six metres long; the components for the hanging support structures; the sealing plates; and the ducting. "The components will be transported to site and erected by AGS, starting early next year with Medupi unit six," says Louw.

"AGS has a long history in both bag filters and electrostatic precipitator filters (ESPs)," he says. "ESPs have discharge electrodes that create electrostatic fields to attract dust at the collector plates. These plates get wrapped with a hammer on a rotating motor which causes the dust to fall off, through a hopper system and onto a conveyor," he explains. AGS is currently involved in refurbishing the ESP filters on unit three of the Matla Power station. "We also do a lot of bucket elevators and overland conveyors for the mining and power generation industries, part of our traditional business, which will continue to be done out of the Tulisa Park workshop."

We ask about quality management: Louw shows us the ISO 9001: 2000 registration certificate for August General Servicing SA incorporating AGS Engineering – initially issued in April 2004, reissued in May 2007 and valid until May 2010. Quality is clearly high on the company's agenda.

"We believe we are the first company in South Africa to receive ISO 3834 part 3 certification," claims Louw. "This was a requirement by Hitachi/ Eskom for the Medupi and Kusile bag-filter contract – not that we had to be certified, but we had to comply with ISO 3834 part 3, which defines the standard quality requirements for fusion welding in both workshops and on-site" – the quality level recommended by the SAIW for structural fabrications and on-site construction.

We ask how the audit process went: "We had no non-conformances and no particular problems. There were a few observations: we had to make welding gauges available to the welders to help them to measure the size of their welds; and gas flow meters to allow them to verify that the regulators were working and that the gas supply at the torch was adequate. We also had to formalise the control side of our baking procedure for low hydrogen electrodes and submit that paper work to the SAIW. That was it," he informs us.

Unlike ISO 9000, ISO 3834 is directly supportive and informative to welders, believes Louw: "It makes the welding requirements very clear and informs a welder exactly how and why he should be following a welding procedure specification (WPS). It enhances a welder's ability to do his job correctly."

The welder's response? "They were not keen at first. ISO 3834 puts more responsibility onto welders. We spent a lot of time and effort explaining the WPSs to the welders so that they could understand every aspect of our welding procedures. Welders can often produce excellent welds, but they don't always understand why or what the weld is about. ISO 3834 ensures that welders understand the link between their work and the quality end result of a whole product," says Louw.

"All our welders now need to clean up their own welds and check for defects," adds Teixeira. "They have all been trained to do penetrant testing (PT) and are encouraged to check anything that they are uncertain about. That way, any defects are found and repaired immediately, before an inspector sees the job."

In order to achieve traceability, every completed weld is now stamped by the welder with his own personal identification number. "So any defective welds can be traced directly back to the welder. They all know this, so they try hard to avoid it," says Teixeira.

Standardisation is another key component of AGS Engineering's quality strategy. "We use GMAW with Argoshield 5 gas for almost all of our welding and have moved over to Fronius machines for all our welders. These are more expensive than some other machines but Fronius gives us very good service and back up and the better service easily makes up for any extra cost," he claims.

AGS Engineering uses Bohler EMK 6 solid welding wire, "which is one of the few that is EN 440 certified. Bohler keeps good stock levels, the quality is right and the certification is right," adds Louw.

For tacking, the boilermakers are currently still using manual metal arc welding, with low hydrogen (LH 7018) electrodes, "but we are moving to GMAW for them too," says Teixeira. "We intend to standardise on GMAW across both facilities by the beginning of next year," he says.

As a result of ISO 3834 and AGS's quality management decisions, "re-work is no longer an issue," claims Louw. "We prefer to spend five minutes longer and encourage welders to get it right first time, and because the welder is doing his own inspection, which is verified by our in-house quality personnel, the independent inspection people seldom find faults."

Brandner is very happy that his company is the first to be certified to ISO 3834 part 3: "Good quality has always been our aim, and not just for profit. Quality is also about people. It gives us all a lot of satisfaction when we see good-looking structures going up – ones that we have made to proper specifications using proper quality standards," he concludes.

Douglas Louw, quality manager and Arthur Teixeira, materials quality control manager of AGS Engineering.