Steinmüller Africa: the steam generation expert

African Fusion **talks to Steinmüller Africa Director, Moso Bolofo, about the company's legacy and its ongoing fabrication and service offering to boiler- and process-steam operators in South Africa and across the African continent.**

"We have been in this country since 1962, so we have a 60-year legacy, largely in the power generation sector," begins Moso Bolofo, the Steinmüller Africa Director. "We started with the now old stations of Grootvlei and Hendrina, then went on to the other baseload stations of Kriel, Duvha, Tutuka and Majuba.

"In recent times, we have been subcontractors to Hitachi for the fabrication of the Medupi and Kusile boilers, which are supercritical boilers that operate at main steam conditions of 240 bar at 560 °C, with reheat temperatures up to 570 °C. This requires Level 1 high-pressure pipework, which is an area of expertise for us," Bolofo tells *African Fusion*.

Steinmüller Africa, he adds, also operates in other industries that use steam, be it for use in their production processes, as in the pulp and paper and sugar industries, or for the generation or reticulation of that steam, as in the petrochemical plants and the fuel refineries.

From doing all the fabrication and following up with the installation and commissioning of several early boilers, the company has progressed to become a key service provider for ongoing plant maintenance. "So when it came to mothballing and de-mothballing the return-to-service plants – Camden, Grootvlei and Komati Power Stations, for example – we were there, doing whatever was needed to make it happen," he says, pointing out that Steinmüller's history proves the claim of being an end-to-end service provider, that "really does look at the whole lifecycle of a plant, from conceptual design, manufacture and installation and, thereafter, to the maintenance and all the way through the service life until de-commissioning."

World-class fabrication capabilities

"In our capacity as an OEM, we did fabrication and construction work for the early power stations, Hendrina, Duvha, Tutuka, Kriel and Majuba and the construction of Matimba power station. Later we were subcontracted for manufacturing of the Medupi and Kusile new-builds and we were a lead contractor for the fabrication of the HP piping," notes Bolofo.

Consequently, Steinmüller Africa has accumulated local manufacturing capabilities that cover a wide range of high-pressure components for steam boilers. "Our large-scale facilities in Pretoria North have world-class fabrication equipment, such as our Oerlikon Automatic nipple welding system for steam headers; and the Cojafex Induction Bending Machine for pipe spools, both of which are unique to the African continent," he says.

The company's Pretoria facilities have 50 000 m² of under-roof fabrication workshops, with a lifting capacity of up to 50 t. "We have bays up to 35 m wide and 700 m long and a pressure component production capacity of 1-million hours per year," continues Bolofo.

Notable welding equipment for fabricating HP boiler components includes:

- A KLOOS semi-automatic CNC MIG fin welding system for sling tubes, which includes a chuck, a conveyer and two welding heads.
- A PEMA six-head submerge-arc membrane wall welding unit complete with 1.5 m wide by 30 m long conveyers; a turn-around mechanism; storage rack for flat bar and tube; shot blast stations; and a calibrator for flat bar from 26 to 70 mm wide.
- An Oerlikon header nipple welder with two submerge arc heads and an inner fusion TIG head, with each head able to travel across a 28 m length.
- Steinmüller Africa is also the only company in South Africa qualified and approved to perform explosive welding for the power generation sector. This is used to fuse tubes to tube plates or headers in high-pressure heat exchangers and for plugging and sealing leaking tubes.

Steinmüller Africa's header nipple welder with two submerge arc heads and an inner fusion TIG head, with each head able to travel across a 28 m length. Right: A completed header manufactured by Steinmüller Africa in Pretoria North as part of its Medupi and Kusile new-build contract.

Steinmüller Africa's Piping Division is a one-stop shop for all induction bending requirements.

Describing the induction bending machine, Bolofo says that this unit controls the temperature of the pipe bending zone within a very narrow temperature band, plasticising it by just enough to enable highly complex and accurate pipe bends to be formed – without introducing defects or high internal stress to the pipe material. "And we are able to send completed piping for onsite stress relief in our 12.5 by 4.0 m gas furnace or one of our two 11 m long top hat heat treatment furnaces," he adds.

Another area of expertise for the company is in the area of milling for the pulverised fuel (PF) needed by steam boiler operators. "We have done quite a lot of contract work managing PF milling plants and resurfacing the mills with new grinding media. We take care of the plant performance and uptime and are paid purely on the PF produce and plant availability, so clients who use our services have one less critical area to worry about," he informs *African Fusion*.

ISO 3834 and fabrication quality management

"Welding is our bread and butter, so certifications such as ISO 3834, which deals directly with weld quality issues, are vital, especially since we produce welded pressure vessels and high pressure components.

"Especially when dealing with Level 1 plant, ISO 3834 is a system that gives confidence, both to us during fabrication and to our clients and plant operators, because of the potential consequences of what might happen should a component fail.

"The ISO 3834 welding quality system makes sure that, from the inception of pressure parts, all processes, equipment and everything involved in producing high quality and safe welded constructions is line with the codes and is traceable with repeatable results," he explains. "Everybody thinks they can weld, but unfortunately materials change all the time and when considering the operating conditions of most plant, if fabricators are not really careful about managing every aspect of weld quality, very serious, dangerous and expensive consequences may arise once a boiler is put into service," he warns.

"For Steinmüller Africa, this is particularly important, because we continue to be involved on the in-service side for the entire life of boilers. So the ability to track back to find correct information and to know, always, what it is that has been done and how, enables us to respond to issues quickly and appropriately and to best manage longevity," he adds.

Another other area of strength for the company is welder skills and skills development. "This is a big challenge, not only with respect to artisans, but supervisory skills and engineering backup are also scarce. Fundamental to our business is the retention of skills for the country, and this tricky.

"The boiler construction industry is very cyclical, and even on the in-service side, plants are typically running during winter and being shut down for a period in the summer months for repairs. But we need to develop and retain the skills during the quiet months, so the people we need are available when we need them," Bolofo says.

Steinmüller Africa looks for talent among the communities around boiler plants, picking up those who don't have higher qualifications and taking them from basic training and onto being A-plus welders.

"Then we have to train welders when new and sophisticated alloy materials are introduced, for example. We tend to look for talent among the communities around boiler plants, picking up those that don't have higher qualifications and taking them from basic training and onto being A-plus welders. We have our own Welding Academy for developing these welders, but we also use the EBS Academy, which specialises in training in-service boiler tube welders for maintenance work.

"In the past, we used to be dependent on overseas skills, but that's now at an end. So maintaining the welding skills base to ensure we can keep plants running is more important than ever," he notes.

"In all that we do, we strive for very high quality standards, and in the stringent high pressure boiler fabrication environment, which generally requires 100% of the welds to be X-rayed, we are achieving repair rates of 3% and less, well below global norms," concludes Moso Bolofo.

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