



Brimis Engineering embraces ISO 3834

African Fusion talks to Brimis Engineering's Mphephu Nengovhela, operations manager, and Meshi Hamese, chief engineer, who are both Professional Engineers (Pr Eng), about the company's valve and pump refurbishment capabilities for the power and mining industries and its imminent ISO 3834 accreditation.

Brimis Engineering's speciality is the refurbishment, maintenance, supply, installation and distribution of valves and pumps, along with parts and accessories, most notably for the power industry in South Africa. "Our current core business involves repairing, servicing and refabricating the pumps and valves in use at power plants and paper mills around Mpumalanga," begins the company's chief engineer, Meshi Hamese, speaking from one of the company's onsite facilities.

"We also offer general engineering from our Middelburg facility: fabricating chutes, hardfaced chute liners and bins for coal handling plants; rebuilding and repairing shafts; and hardfacing components such as the rocking arms that support the mill rollers on the pulverised fuel crushing plants," continues Mphephu Nengovhela, speaking from Brimis' Middelburg fabrication facility.

"For the valves and pumps used at power stations, we do extensive amounts of hardfacing work using exotic materials such as Stellite – on the valve trims, for example – to restore the functionality of these products to OEM

specifications and raise the reliability levels of the electricity grid," he says.

Describing the company's typical refurbishment cycle, Hamese says that the starting point is usually onsite. "We will first assess the condition of components and measure these against the expected performance. We then recommend a refurbishment programme to restore these components to the specifications required by the client. Once this is agreed, we work to industry and OEM standards, codes and practices to refabricate the unit. And, before a pump or valve is returned to service, we perform a pressure test and sign off on all of the quality control certificates," he adds.

Nengovhela says that feedwater, ash handling and fire pumps are routinely passed through Brimis' facilities. "Ash slurry is highly abrasive and it can cause accelerated wear. If certain contact areas of the pumps and valves are not hardfaced, the pump can be lost in a matter of hours. This is also the case for the rocker arms for the PF crushing mills. Parts directly exposed to coal must be hardfaced to extend their wear life.

"On the valve seats, any wear will



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cause the valve to leak, so many of these are hardfaced using Stellite. We typically deal with parallel slide valves on the feedwater side, non-return valves (NRVs) and knife gate valves for controlling the steam flowing through the soot blowers, for example," he tells *African Fusion*.

A refabrication of an ash handling centrifugal pump, he adds, will often require the entire impeller to be recast and machined, while the worn casing may need to be built-up using welding before being hardfaced in the contact areas and machined back to its dimensional specification.

Brimis Engineering's current head office in Middelburg has 800 m² under roof, where custom engineering, in-house machining, valve testing and reverse engineering is done. "Significant amounts of our welding and hot work currently has to be outsourced, however, notes Nengovhela. "We are currently also limited to using A-frame cranes for lifting, but we are looking to procure a new facility with overhead cranes to increase our capacity," he adds.

Welding and ISO 3834

For hardfacing and weld build-up work, which varies considerably from unit to unit, Brimis' fabrication workshops in Middelburg and at the Kriel and Tutuka power stations are mostly using Manual Metal Arc (MMA) welding electrodes. "We are currently moving towards the use of semi-automatic gas shielded metal arc welding (GMAW), especially for hardfacing using exotics such as Inconel 625 and Stellite, though," says Hamese, adding: "For highly specialised work or when we run out of capacity, however,

we currently have to contract out parts of a refurbishment."

The process to become certified to ISO 3834 is a key step in bringing more of this specialist work into Brimis' own fabrication facilities. "In April, we received Readiness Approval for ISO 3834 certification from the SAIW. We have since submitted our application package, which has been accepted and the SAIW has completed and is happy with the preliminary review of our procedures. We have formally qualified our most critical welding procedures and we are now awaiting the final physical audit of our Middelburg facilities," Nengovhela tells *African Fusion*, adding that he expects the facility to be accredited before the end of June.

"This will give us ISO 3834 Part 2 accreditation and registration as an ISO 3834 Certified Welding Fabricator on the SAIW's scheme," he says.

"In the niche repair market for industrial valves and pumps that operate at higher temperatures and pressures, any fabricator using fusion welding processes for refurbishing such equipment must now be accredited to ISO 3834. We already have the know-how and, once accredited, we will be able to bring in more of this work, making us more cost competitive, more flexible and reducing lead times," Hamese notes. "This accreditation has become essential for us to retain and expand our client base and to extend our offering," he adds.

"We understand the pain points on power stations and industrial plants. We know what needs to be done and how important it is to be more flexible, more agile and more productive. Brimis has adopted a non-traditional approach to engineering. We are striving to be an engineering partner of choice for the wide range of services needed by plant operators," Hamese tells *African Fusion*.

Brimis is also currently expanding its facilities and its service offering. Nengovhela explains: "As well as expanding our fusion welding capability through ISO 3834, we are also investing in our machining capability to enable us to meet the global standards required by our target clients. In addition, we are talking to local foundry partners with a view to starting to cast the components we need to refabricate client equipment.

"As a result of COVID, we are struggling to source alloy materials, particularly when it comes to the exotics. In partnership with local foundries and



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Once refurbishment programmes have been agreed, Brimis artisans work to industry and OEM standards, codes and practices to refabricate units.

forging houses, we are seeking rapid ways to service our customers. We had a recent enquiry from the petrochemical industry, for example, for the refurbishment of some 400 valves, but the contract specified that we had to turn them around within 30 days. We were not able to deliver at that rate, so we had to turn the contract away.

"With the new expansion, we hope

to be able to turn a valve around within a single 12-hour shift, which is the kind of speed and agility that we know we are capable of. In addition, our ISO 3834 accreditation will assure our industrial clients that all the welding and hardfacing work we undertake meets international quality standards," Nengovhela concludes.

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