Noel van Onselen talks about the filling facility for medical oxygen.

Afrox unveils R60-million KwaZulu-Natal investment

On 21 September 2016, Afrox unveiled a new flagship facility in Riverhorse Valley, Durban North, a filling and engineering services hub that represents an investment of more than R60-million. *African Fusion* attends and reports.

"This modern 18 000 m² site is designed to international best practice and standards to guarantee our gases and services are of the highest quality," says Afrox GM for operations, Jan Ntuli, adding that "operations are backed by the technologies and expertise of the global gases, engineering and technology giant, The Linde Group."

Afrox now has the ability to meet the growing demands of large and small industry across KZN with a filling capacity of 22 000 cylinders a month, an improvement of 15% from the old Maydon Wharf plant. The new facility has a fully stocked warehouse, customer engineering services, a service engineering department and a fleet of 10 distribution vehicles, all under one roof. "This ensures that we maximise the synergies between various departments to deliver excellent customer service," Ntuli says.

Afrox Riverhorse Valley offers a convenient one-stop-shop for Argoshield, CO_2, Nitrogen, Helium, medical and food grade gases as well as portable cryogenic containers.

A plant tour

A tour of the facility by Afrox's area production manager Noel van Onselen started in front of the four cryogenic vessels dominating the Riverhorse Valley skyline. The plant takes delivery of liquid CO_2 from NCP in Durban, Nitrogen and Oxygen from the ASU in Pietermaritzburg as well as Argon from Pretoria. These liquid gases are all transported in road tankers.

Inside, van Onselen's first stop is the filling facility for medical oxygen. "We operate two separate filling plants here," he says. "The legal requirement for medical gases requires that the medical and industrial filling facilities are 100% separate," he explains. "You can see that this filling station has a hospital feel about it, very modern and clean, to ensure that we comply with the stringent medical gas quality requirements."

Describing the filling process, he says that liquid oxygen from the tank outside is pumped through vaporisers, allowing it to evaporate and expand, which, with the help of a pump, takes it up to a pressure of about 200 bar. It is

Four cryogenic storage tanks dominate the Riverhorse Valley skyline. The plant takes delivery of liquid CO_2, Nitrogen, Oxygen as well as Argon from Pretoria.

then fed into the filling station where, under PLC control, a manifold of oxygen cylinders is filled.

"We have separate pumps for delivering the medical and industrial oxygen, both of which are at above 99.5% purity. On the medical side, though, we are required to add several additional processes: a pre-purge and vent to make 100% sure that no impurities have entered the empty cylinder and, after filling, a purity analysis is carried out and a batch number is added," he says.

On the industrial side of the plant, he explains that all the filling stations are supplied with compressed gas. Beverage grade CO_2 is filled in liquid form into the cylinder at approximately 60 bar and settles in the cylinder at 27 bar. When used, gas boils into the void at the top of the cylinder before passing out through the regulator. "We are also waiting for a nitrogen-CO_2 mixing station, a mix now used by many beer brewers. The nitrogen is used to bring the CO_2 out of the beer to give it a good head," he explains.

Alongside these two stations, a row of mixing stations for industrial gases sits across the width of the facility, for high purity argon and the welding shielding gas mixtures such as Argoshield 5, Argoshield Light and Argoshield Heavy. "The operator attaches a manifold of cylinders to the filling station, selects the recipe required from the SCADA and the PLC will automatically fill the cylinders to the correct composition," van Onselen explains.

Embedded in each filling system is advanced temperature-pressure compensation. "The temperature rises as the pressure inside the cylinders increases, so a higher partial pressure of each constituent might be required for compositional accuracy. This is automatically controlled so that, at 200 bar and 20 °C, the composition is spot on," he notes.

"We also control the fill rate using VSD drives on the pumps to prevent the cylinder temperature rising too high. This slows down the fill time but it shortens the waiting time required for the cylinders to cool following filling," he explains.

The facility also has cylinder filling stations for industrial and certified high-purity Nitrogen, along with Industrial Oxygen – "and to cater for growing nitrogen demand, a second nitrogen rig will be installed before the end of the year," van Onselen notes.

To the left of the filling stations is an empty cylinder sorting, testing and repair facility. "We have a hydro-test rig, two spray booths, wire brush machines and valving and devalving equipment to enable us to maintain and pressure-test our cylinders to meet legal requirements," he continues.

Behind the filling facility is warehousing: for filled and empty cylinders; Afrox's hardgoods and welding consumables; and the service engineering department. "We are now an 'under-one-roof' distribution outlet for the KZN region," says Van Onselen.

In a warehouse behind the filling facility itself, van Onselen points out the storage facility for filled and empty cylinders and the warehouse for Afrox's hardgoods and welding consumables. "We are now an 'under-one-roof' distribution outlet for the KZN region. Through our service engineering department, we offer a repair service for customer's welding equipment and Afrox CES deals with installations such as bulk gas supply systems; gas mixing panels; LPG; restaurant installations; and much more. This is the first time in many years that all of our offerings have been together," he says, concluding the tour.

Schalk Venter's growth optimism

"We have belief in the African growth story," says Afrox MD, Schalk Venter. "While we are currently still bound to the commodity cycle, underneath this exposure, Africa is still growing at four and five percent in places such as Kenya and Botswana," he tells *African Fusion*.

Venter sees a relatively poor middle class in Africa getting richer in the medium term. "By 2030, Africa will have close to 2-billion people and about 40% of them will be 16 and younger. These people will have aspirations and increasing wealth," he predicts. "We see ongoing investment in facilities such as hospitals. These consume medical oxygen and, for the likes of MRI scanners, need helium for cooling.

The operator attaches a manifold of cylinders to the filling station, selects the recipe required from the SCADA and the PLC will automatically fill the cylinders to the correct composition.

"As the income of the middle classes rises, we expect to see growing demand for higher quality foods and beverages, with an associated rise in the need for nitrogen for food preservation and chilling and CO_2 for carbonating beverages.

"LPG use is also exploding," he adds, citing the government in Ghana, which, to reduce deforestation, "has procured 50 000 nine kg LPG cylinders for the supply of gas to rural communities.

"Across Africa, we now have manufacturing facilities and offices in 13 countries, along with four ASUs outside of South Africa," he says.

"Our R60-million Riverhorse Valley facility is geared specifically for efficiency and cost-effectiveness, aimed at benefiting customers in the medical, hospitality and industrial sectors, and sets a new standard by which modern industrial gases hubs will be measured.

In support of its new investment, "Afrox supplies of Handigas LPG via our Pinetown operations are guaranteed with added support of imported product into the Bidvest Tank Terminal in Richards Bay, where upgraded road and rail links ensure that we can deliver LPG in bulk," Venter concludes.