

Fluid engineering for better power security



Underpinned by its Fluid Engineering philosophy, HYDAC Technology designs tailored fluid solutions to enable power generation plant operators to optimise energy efficiency, process reliability, system availability and the conservation of resources. *MechChem Africa* talks to Jannie Botha, HYDAC Technology's sales manager for the power generation industries.

prevent damage to hydraulic pumps, valves and seals. We therefore believe that paying attention to the whole system is vital to the sustainability and longevity of critical power plant systems," he adds.

On the filtration side, Botha notes that HYDAC has a complete range of oil quality monitoring solutions for use in critical hydraulic and lubrication systems. "The monitoring equipment available to us can provide real-time online data about the quality of the oil in use. As well as becoming contaminated due to dusty working environments or wear particles, hydraulic and lubrication oil typically degrades due to water ingress or to the varnish that forms when oil oxidises. Not only can we detect and alert plant operators when the presence of contaminants reaches dangerous levels in the oil, we have systems

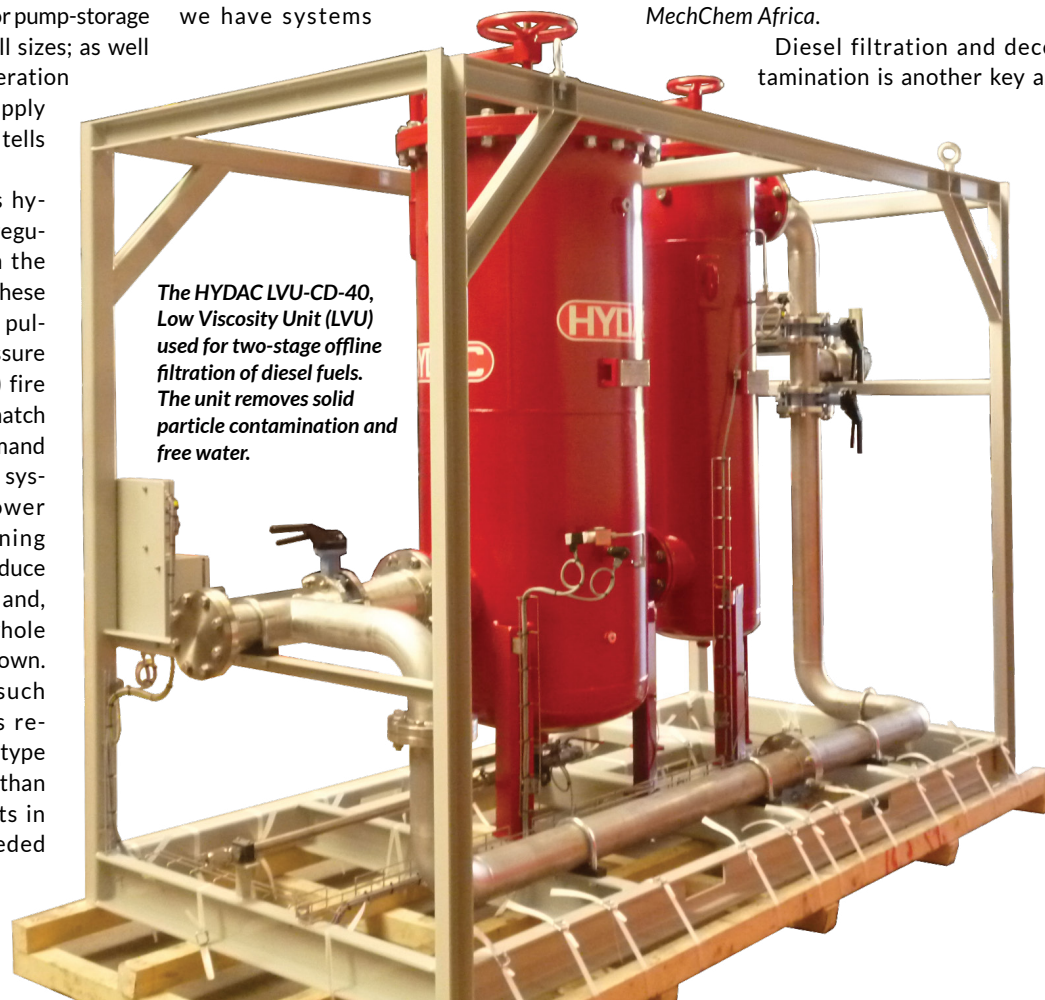
that can restore the oil quality and extend its life. This saves money and reduces plant downtime. It also reduces waste oil disposal requirements, leading to better sustainability," says Botha. HYDAC systems for 'oil purification' include vacuum dehydration (FAM), which operates on the vacuum dewatering principle to eliminate free and dissolved water and gases; varnish mitigation units (VMU); varnish elimination units (VEU) for removing oil ageing non-filterable gels; and ion exchange units (IXU) for treating fire-resistant fluids. "And for those who don't have ongoing needs, we also offer a professional rental service. We can deploy one of our hire units on site, passing the oil in the system through the cleaning process and disconnecting the unit once the contamination levels are again acceptable," he informs *MechChem Africa*.

Diesel filtration and decontamination is another key area

HYDAC Technology is in a good position to help transform the stability of South Africa's power supply. "A number of our power stations are very old and currently have operational challenges," says Jannie Botha, sales manager for the power generation industry at HYDAC Technology. "We specialise in turnkey solutions for any hydraulic, lubrication, filtration, control or drive system: for coal- and gas-fired generation plants; for pump-storage and hydropower plants of all sizes; as well as for the many diesel generation units now being used to supply emergency demand," Botha tells *MechChem Africa*.

He cites the company's hydraulically driven fuel-flow regulators that are installed in the new-build power stations. "These systems govern the flow of pulverised coal into the low pressure (LP) and high pressure (HP) fire boxes of the boilers, to help match the fuel consumed to the demand for power. They are critical systems in any coal-fired power station. A poorly functioning regulator can significantly reduce the efficiency of the boiler and, if these systems fail, the whole boiler may have to be shut down.

"We supply solutions such as these as retrofits or as re-engineered systems for any type of power station. But more than that, we are also specialists in the filtration solutions needed to keep these vital components running healthily. Keeping hydraulic oil clean and free of contamination is essential to



The HYDAC LVU-CD-40, Low Viscosity Unit (LVU) used for two-stage offline filtration of diesel fuels. The unit removes solid particle contamination and free water.

of expertise for HYDAC. "For every step of the diesel supply chain, from production to consumption, we at HYDAC can offer a specific solution for monitoring, filtering and dewatering diesel fuel. This is vitally important for backup diesel generators in the power industry, which are often operated in damp or dusty environments. We develop and supply diesel conditioning systems ensuring that the highest levels of diesel quality are readily available to be used in backup generators.

"Water contamination is one of the major enemies of any diesel-fueled equipment. It can also cause the diesel injector tips to explode, resulting in expensive repairs. In fact, slugs of water in the fuel can cause sudden cooling in the engine and may result in shortened engine duty cycle life," he notes, adding that a failure of an emergency power generator is a high-risk issue. Properly maintained filtration solutions can go a long way towards mitigating this risk.

From a monitoring perspective, Botha adds, optimal transparency of the diesel condition in terms of both particulate and water contamination can be secured using online monitors that can track, trend, and send alerts in real time if limits are exceeded.

HYDAC also has extensive know-how within the renewable (Solar, Hydro and Wind) energy industry, "We are dynamic and driven by innovation, thanks to our optimised components and turnkey system integrated solutions," says Botha.

"HYDAC supplies tried-and-tested technologies and innovative solutions for most renewable electricity generation technologies. We feel at home whenever low- or high-pressure hydraulics, lubrication, cooling, or process filtration is required," he adds.

Fluid Engineering: a HYDAC perspective

As part and parcel of a turnkey HYDAC solution, HYDAC adopts a fluid engineering perspective to ongoing maintenance, repair, and operations (MRO) requirements. Optimised filtration is an important aspect of MRO, but it represents only one part of the service spectrum.

Fluid engineering also offers:

- The optimisation of production processes and systems.
- Fluid conditioning for process reliability and increasing service life.
- Minimisation of initial contamination of parts and systems to reduce downtime.
- Digitisation of systems and processes as a basis for condition monitoring and predictive maintenance.

"We do this," says Botha, "to enable power plants to improve performance in four key area: energy efficiency; process reliability;

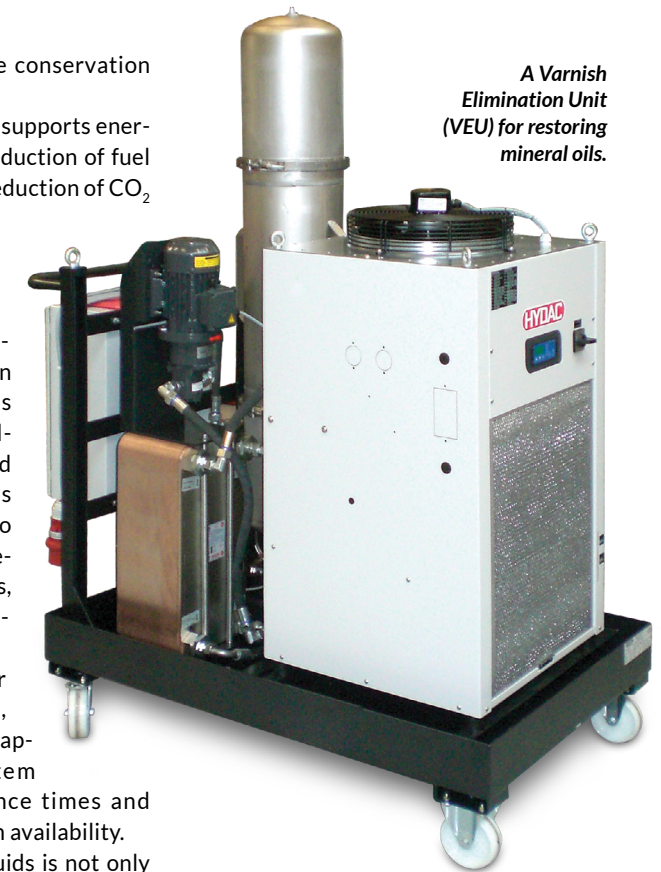
system availability; and the conservation of resources".

- Good fluid engineering supports energy-efficiency via the reduction of fuel consumption and the reduction of CO₂ emissions.
- Condition monitoring, in conjunction with predictive and good preventative maintenance and filtration programmes, enables potential machine failures to be recognised early on, so operators can intervene early to improve reliability, prevent production failures, and ensure ongoing reliability of the system.
- In combination with our monitoring solutions, the Fluid Engineering approach reduces system repair and maintenance times and improves power system availability.
- The optimum use of fluids is not only crucial from an environment perspective, but it can also save costs. HYDAC can support power plants in extending the life of the hydraulic and lubrication fluids used by power plants, while reducing wear rates and service life intervals.

"We are ready and able to participate in the transformation of South Africa's power

generation industry. Our solutions can be adopted at any scale, and while we have the global backing and quality credentials of our of global parent, HYDAC Germany, we have extensive local expertise and experience in this industry," Jannie Botha concludes.

<https://www.hydac.com>



A Varnish Elimination Unit (VEU) for restoring mineral oils.



A service friendly Varnish Mitigation Unit (VMU) for treating mineral oils.