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PUBLICATIONS



Condition Monitoring is at the
heart of machine reliability.

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Condition Monitoring Specialists

This month:

SWAS Compact boiler
monitoring solution

Ion exchange pre-treatment for
mine wastewater

African Hydrogen Partnership to foster
green hydrogen

Bio-economy and wood: the
original renewable

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WearCheck's ever-expanding preventive maintenance offering

Neil Robinson, CEO of WearCheck, talks to *MechChem Africa* about the company's expansion from a two-laboratory oil analysis service in South Africa with 73 employees, to an international and multi-faceted condition analysis and reliability specialist employing 279 people at laboratories, support offices and client sites in nine different countries of the world.

“While I was born in South Africa. I went to school and university in the UK and spent the first 18 months of my career as a trainee in the lubricant development laboratories of Esso Petroleum, just outside Oxford,” begins Robinson.

“When I saw a job advert for a chemical analyst in South Africa, I thought, why not? I was born here, and it was easy for me to come back, so I applied and got the job. I joined WearCheck in 1997 as a chemist in the oil analysis laboratory in Durban. I was soon promoted to laboratory manager, then technical manager and, in 2005, I became managing director. So, I have spent most of my working life working here at WearCheck,” Robinson tells *MechChem Africa*.

He says that basic oil analysis was the only service offered in the early days, looking at wear metals, water and contamination levels in used oil from engines, gearboxes and hydraulic systems. “We have since been adding more and more complexity: filtering out the metals and looking at its composition under microscopes, for example, which enables us to determine specific components at risk, introducing photos to our reports and improving our analytical technology to be more automated, robust and sophisticated.

“We added fuel and coolant analysis to our

offering and started to measure the total acid and total base numbers (TANs and TBNs) for engine and gearbox oils – all to advance the accuracy of an interpretation and to confidently determine the best way forward in terms of maintenance,” Robinson explains.

“Anybody can produce test results,” he suggests. “We strive to give customers a best-possible equipment diagnosis, so they can better target maintenance requirements and continuously improve machine reliability.”

WearCheck's oil analysis experience established a springboard for a broader data analysis approach to equipment. “For our entire history, our people have been looking at trends and numbers, while using their experience, gut feel, an understanding of how the various machines behave and their physical locations, to produce holistic reports to help operators implement strategies to improve reliability and extend asset life,” he explains.

“We strive to produce accurate interpretations of the data we collect to convince engineers to do the preventive maintenance needed to get the best out of their equipment,” Robinson informs *MechChem Africa*.

WearCheck's approach to expansion

To secure future growth, Robinson describes a jigsaw puzzle approach, which started by looking at other equipment monitoring and



analysis services that fitted with the central oil analysis piece of the puzzle. “At each of our client sites, we started to look for additional and related services that could be added to our existing offering to help customers collect a little more data about their equipment.

“Engines needed coolants, for example, so we added a coolant testing programme. We then looked at fuel testing and limited capacity grease testing, which was followed by transformer oil testing. This expanded the range of services offered, while not affecting our core oil analysis focus.

“Having started this process, we then looked at other technologies that related to the new services we had added. Along with an oil sample on a bearing for an engine or gearbox, we discovered that customers routinely needed vibration analysis and shaft balancing services. That led to us investing in a reliability services division, which now includes vibration testing, balancing, ultrasound, thermography, and much more.

“We recently acquired a division of Anglo called Anglo Field Services, which came with a host of new technologies that were unrelated to our central piece. But this opened up opportunities to add new pieces. One of these services was rope condition assessment (RCA), for example, for mine hoists, drag lines, cableways and other rope-based conveying systems. This is done using visual inspection techniques along with advanced eddy-current testing, which can detect surface cracks, frayed strands, corrosion or thinning,” Robinson explains.

Along with this acquisition, WearCheck also inherited a technical inspection and compliance division, which is accredited to certify the safety of hoist systems, fans, electrical panels and other critical mining systems. “This ‘piece’ has no obvious links to



A view of WearCheck's new Durban laboratory, which was opened in November 2020 and is now the hub of the company's Africa-wide service offering.

oil analysis, but it has everything to do with condition monitoring and improving safety, reliability, productivity and extending asset life. We even have a machine to test the integrity of underground rail tracks for hopper cars," he adds.

"Today, we see ourselves as the kind of company that is willing to offer condition monitoring services of any kind. We don't want WearCheck customers ever to need to phone another company for a testing or evaluation service," he says.

WearCheck's work in India, for example, stems from oil samples sent from India's wind farms for analysis in Dubai. Now a laboratory has been set up in Chennai to analyse gearbox and transformer oil for the wind turbines there. "These gearboxes are subjected to very high torque, which produces a completely different wear pattern from other plant equipment. Also though, the transformers are subjected to extreme power cycles as the wind gusts, which creates gases in the oil unlike traditional transformers. This service has been extended into South Africa and we have become a global specialist in this area, which we hope to expand, by adding vibration services to our wind turbine offering, for example.

This approach has led to significant growth. "When I started at WearCheck, we had 73 employees in Durban and Johannesburg. We now have 279 employees in nine different countries – and this includes 36 highly skilled vibration analysts who came to us when we acquired the ABB vibration team back in 2012," Robinson notes.

Now, as well as its presence in South Africa – a central oil analysis lab in Durban, two in Jo'burg and local laboratories in Middelburg and Cape Town, along with support offices in Springs, Steelpoort, Witbank, Port Elizabeth, Bloemfontein, Rustenburg and Khathu – WearCheck has laboratories in Namibia, Mozambique, Zambia, Zimbabwe, DRC, two in Ghana, one in India and one in Dubai, all



Senior analytical chemist, Lynette Pillay, working on transformer oil analysis in WearCheck's transformer lab.

of which are constantly adapting their local service offering to best meet local needs.

Robinson explains: "Our core expertise sits here in South Africa, where we deliver ten or so different services. But we can take any one of those services to anywhere it is needed. In Zambia for example, if there is a need for rope condition assessment, we can go to Zambia and put that piece in place on a permanent basis. We can then ask what other services fit with the rope condition service, which may be vibration analysis and thermography. So, a new jigsaw of services emerges that does not have oil analysis at its centre. It also means that the service offering in each different area becomes highly customised to local industrial needs," he informs *MechChem Africa*.

"We are currently adding transformer testing to the DRC, fuel testing for India, and we build up these capacities and replicate them from South Africa," he adds.

The international organisation, Robinson says, works on a spoke and hub principle centred around South Africa. "The oil analysis lab in Ghana, for example, employs only a handful of people, yet it processes about 3 000 samples every month. This can be achieved because, while the local employees are operating the analysers, the machines are managed, controlled and calibrated from South Africa and all of the data is uploaded and sent to Durban for detailed analysis and

diagnostic interpretation.

"This allows us to quickly set up labs anywhere in the world and operate them fairly cost-effectively while maintaining the highest standards of accuracy. Our dedicated team of professionals sits in Durban and they communicate with remote labs all over the world.

"We have developed a robust laboratory information management system (LIMS) and written our own software called OASIS, which manages our entire system. The operating temperature of an instrument in Ghana, for example, can be changed from South Africa. The software also forces machine calibration testing to be done at regular intervals – and it prevents any further testing being done should a process control standard or calibration sample fail. This means that all our instruments give exactly the same results at any point in time," he assures, adding that this enables the remote labs to be run without the need for graduate chemists and tribologists.

Looking to the future, Robinson says WearCheck has started looking at the IoT and the sensorisation trend for plant equipment and drives. "We are exploring big data and remote analysis opportunities using modern connected-sensor technologies," he reveals.

"We believe Africa offers huge growth opportunities. We are lucky in that so many of the maintenance personnel across Africa come from South Africa. We are looking to establish laboratories in Burkina Faso and Guinea in West Africa, Tanzania and Ethiopia in East Africa and we will have an additional lab in Lubumbashi in the DRC within the next 18 months. "We are also looking to establish bases where we don't yet have a presence: the Middle East, Turkey and Australia, for example.

In terms of expanding testing technology, he says it's all about looking for needs that fit with the central piece of testing the company offers on a site: brake testing; ad-blue additive and exhaust emissions testing; underground emissions and air quality testing; and so on.

"While individual services may not have a direct route back to oil analysis, we can always trace a service back to preventive maintenance, our core," Robinson concludes. □



Roger Herrwood performing a rope condition assessment (RCA). WearCheck now has a technical inspection and compliance division accredited to certify the safety of hoist systems, fans, electrical panels and other critical mining systems.