WEAR CHECK AFRICA MONITOR ISSUE 11

IWCG conference benefits all

REPRESENTATIVES from Wearcheck Africa's seven associate companies in Europe, North America and Australia attended the fourth annual International Wearcheck Group (IWCG) conference in South Africa for the first time during May.

According to Wally Crawford, managing director of Wearcheck Africa, the conference was a resounding success resulting in the cementing of relations between the different companies and concrete plans for international collaboration on several strategic projects.

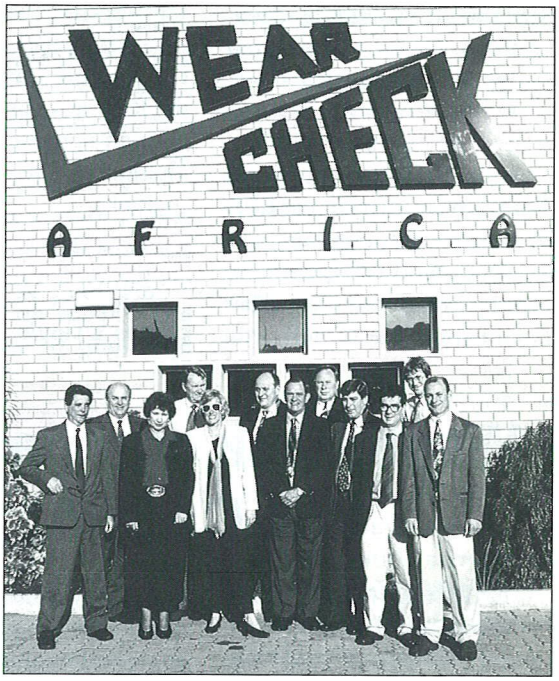
The Internet

"We will be joining forces to develop specialised computer software for the group, combining the expertise and creative skills of all members," Mr Crawford said.

"This will be aided by a link through the Internet between the eight companies to facilitate communication. A Wearcheck home page on the World Wide Web featuring information on oil analysis and the IWCG companies will give the Internet users worldwide access to this data."

Wearcheck Africa will also use the Internet to communicate with the Swansea Tribology Centre at the University of Wales regarding the diagnosing of samples using the new RPD instrument developed by the university; and the CASPA (computer-aided systematic particle analysis) software programme which Wearcheck is beta testing for the university.

"The sharing of resources, technical information and computer software means that all of the group companies will have access to the latest technology internationally," Mr Crawford said. "It will also enable us to develop a standardised information management system in line with world trends."



Members of Wearcheck companies in the UK, Canada, Spain, Germany, Belgium, Australia and the USA met at Wearcheck Africa's Pinetown headquarters for the fourth annual IWCG conference in May.

High yields for Wearcheck Belgium

THIS IS THE FIRST of a series of articles featuring Wearcheck companies in other parts of the world.

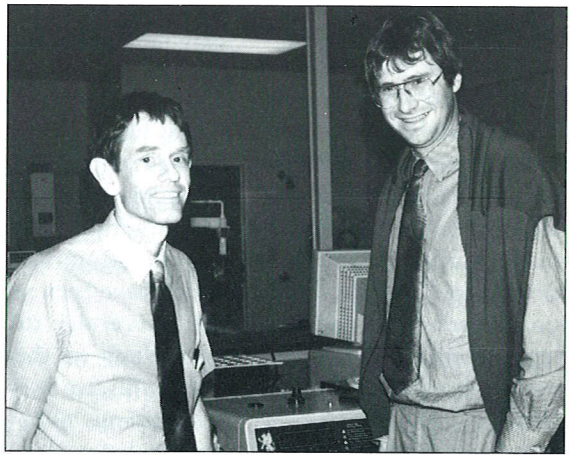
WEARCHECK in Belgium falls under the banner of Alpha Maintenance Systems, a co-operative consisting of several companies countrywide which, besides oil analysis, specialise in thermographics, vibration analysis and water analysis.

Established in 1987, the Wearcheck lab is the biggest independent oil analysis specialist in the Benelux countries. Major customers include Total, Shell, ACEC, BASF and Agip Socomissil.

Competition is fierce there according to Andre Verlinden, manager of Alpha's Wearcheck division. "All of the big oil companies have their own labs and there are dozens of opposition firms in Belgium, France and the Netherlands."

Andre maintains that being a member of the International

To Page 3



Andre Verlinden of Wearcheck Belgium (right) catches up on the latest developments with Alistair Geach in the Pinetown laboratory.

New rotary particle depositor (RPD) increases accuracy of wear metal diagnosis

WEARCHECK's new rotary particle depositor (RPD) will, with the help of a powerful new optical microscope, enable diagnosticians to examine the morphology - size, shape and colour - of metal particles to provide an accurate indication of the wear modes of components.

In-depth testing

According to technical director Gary Brown, the RPD is used as a secondary, in-depth method of testing for samples which require further examination due to bulk iron readings or high particle counts. The RPD separates the wear debris from the lubricant and deposits it on a slide for examination under a microscope.

Developed by the University of Wales in Swansea, which also designed the particle quantifier (PQ), the RPD is a quicker and more economical method than its alternative, the analytical ferrograph.

Circular deposits

Whereas the ferrograph pumps a single line of debris onto the slide with the particles ranged along the line from large to small, the RPD produces three circular deposits, with each circle showing distinct particle sizes (large on the inside, medium-sized in the centre and small particles on the outer ring).

Particles

This circular arrangement means that the particles are more widely distributed, eliminating the need to dilute samples containing heavy concentrations of wear debris as is necessary when using the ferrograph method. The circular slide also distributes the particles over a greater area making them more clearly distinguishable.

Accurate

The slide is then examined under a microscope which magnifies the particles up to 1000 times their size. The diagnosticians can tell from the morphology of the particles whether the component is experiencing normal rubbing wear or abnormal wear.

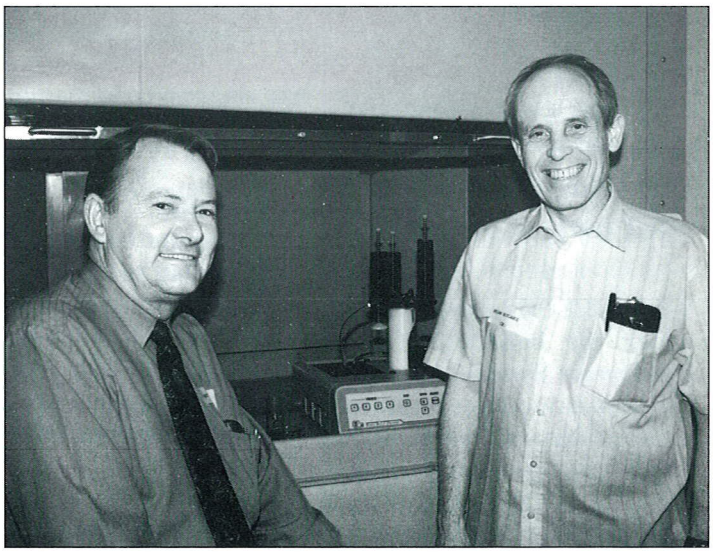
"Analysis of these slides requires a skilled diagnostician assisted by a particle atlas which features photographs of an extensive range of particles reflecting different wear modes," says Gary.

"An experienced diagnostician can see immediately if a component is under stress and what action needs to be taken. It is a highly accurate technique."

Wearcheck Africa is the only commercial oil analysis laboratory in southern Africa and the second International Wearcheck Group company to have purchased the instrument.

Specialist

Also present at the recent IWCG conference was Dr Brian Roylance of the University of Wales' mechanical engineering department which developed the RPD. He was invited to make a presentation on the capabilities of the RPD to the international Wearcheck companies and to work with Wearcheck Africa's diagnosticians.



Dr Brian Roylance (right) of the mechanical engineering department at the University of Wales, Swansea, discusses the capabilities of Wearcheck's new RPD with technical director, Gary Brown.

Wearcheck companies test CASPA

WEARCHECK Africa and Wearcheck Canada have been selected by the mechanical engineering department of the University of Wales at Swansea to perform beta trials on an artificial intelligence software application which they are currently perfecting for use with the RPD or the analytical ferrograph.

Computerised

Named CASPA (Computer-Aided Systematic Particle Analysis) the new procedure takes the user systematically through the steps taken by the human analyst when looking through a microscope, asking questions at each stage and providing a conclusion from the answers entered into the computer.

"It has basically captured what an expert wear debris analyst has built up in his mind over years of experience, computerised it and converted it into a rule-based system which can be used by relatively inexperienced personnel," says Dr Roylance.

User-friendly

Now in its second windows-based version, the user-friendly CASPA programme is ideal for training and for checking diagnostic results. It also stores information on the computer data base where it is readily accessible.

Wearcheck Africa and Wearcheck Canada are two of several independent organisations worldwide which have been selected by the university to conduct beta trials on the system. They will give it a thorough evaluation over several months before the system is finalised and marketed internationally.

Middelburg Mine reduces problem samples and repairs

THE BENEFITS which can be gained from incorporating oil analysis into a predictive maintenance programme are directly related to how effectively the two are integrated and the extent to which management and the workforce commit themselves to the oil analysis philosophy.

So says Richard Broderick, resident engineer at Middelburg Mine which has been using Wearcheck's oil analysis programme for the past 13 years and experiences among the lowest percentage of problem samples in the opencast mining industry - 14% in comparison with the industry average of 20,05%.

This is the result of a concerted strategy begun in 1991 when the maintenance programme was put on the Middelburg Mine mainframe computer and linked to Wearcheck's data system. The link provided the mine with immediate access to current analysis reports as well as historic sample data going back to 1987.

The Middelburg Mine diesel maintenance team, left to right, Hans Vis (maintenance management superintendent, Duvha Section), Dudley Lotter (diesel engineer, Duvha section), Ivan Price (assistant resident engineer - diesel fleet) and Richard Broderick (resident engineer). Absent is Allen Schnuir (assistant resident engineer, field) who plays a major role in the management of the oil analysis programme.

"Catastrophic component failures have dramatically reduced and the Wearcheck programme has become a way of life for everyone involved in maintenance, from management to the artisans," Mr Broderick said.

Part of this strategy is the ongoing training of staff who regularly attend Wearcheck's oil analysis courses.

Training

"We can see the results of the training courses in the workshop. They have helped staff understand and believe in the system and to grasp it as part of their everyday working life."

Middelburg Mine has over 200 units on the Wearcheck programme - mainly Caterpillar equipment and plant such as crushers, draglines and conveyors - which generate over 1 200 oil samples per month.

Mr Broderick cites several examples of how the mine has used oil analysis to reduce expenditure on repairs and maximise use of plant and equipment.

Extend life

"Oil analysis is invaluable when we extend the life of an engine under controlled conditions," he said.

"We recently increased the life of the engine on a 992C front-end loader to 11 000 hours. This unit was one of three in constant use. If it had failed, it would have had a disastrous effect on production. Basically, oil analysis gave us the confidence to undertake the extension with peace of mind."

Ten new coal haulers with Caterpillar 3508 engines currently in operation at the mine have an engine life expectancy of around 13 000 hours. The machines have worked 12 000 hours and, through careful monitoring of oil condition, the mine is planning to take them to 15 000 hours.

Plan downtime

"Oil analysis reports obviously help us when we are budgeting for new machinery," Mr Broderick said. "They also enable us to plan downtime which has a big impact on productivity."

Failures on several of the mine's plant conveyor gearboxes have been averted through early detection of excessive metal generation. In one instance a gearbox was constantly generating copper and overheating. By trying out several different types of oil and monitoring the copper content at regular intervals, a suitable oil was found which, though expensive, caused the wear rate to decline substantially.

Feedback

"When oil analysis alerts us to a problem, we open a works order which is only closed on satisfactory resolution of the problem," Mr Broderick said. "All information surrounding the component is fed back to Wearcheck via computer and stored in the data bank."

Consistently accurate reports, a fast turnaround of samples and a reliable, flexible service are of the utmost importance to the mine.

Accurate

"We average a two-day turnaround on critical samples and a three to four-day turnaround on 'no problem' samples," Mr Broderick said. "It is also reassuring to know that when something urgent or unusual crops up, Wearcheck will go out of their way to help get to the root of the problem."

From Page 1

Wearcheck Group (IWCG) makes it easier for the Belgian operation to get new business.

"The association enhances our bargaining power when we contact local customers who are serviced by Wearcheck companies in other parts of the world."

For a small operation manned by four people - three chemists and one technical employee - the lab processes an impressive 40 000 samples annually. This is partly due to the high level of automation in the laboratory.

Andre and Wearcheck Africa's laboratory manager Alistair Geach had a lot to catch up on since Alistair visited the Belgian lab last year. Andre showed particular interest in modifications that the Pinetown lab has made to the PQ90 and plans to do the same for the Belgian operation.

New Zululand transport contract

IKHWEZI TRANSPORT has appointed Wearcheck as its oil analysis company after being awarded the transport concession for the greater Richards Bay/Empangeni area in March.

This brings the total number of oil samples analysed by Wearcheck for the Transport Advisory Services (TAS) group nationally to over 1000 samples per month.

Hannes Venter, Ikhwezi Transport's manager: technical services, said that his company was a firm believer in the value of oil analysis and that Wearcheck had proved its worth over the years by providing a consistently efficient service which supplied intense diagnostic results.

"If used properly, oil analysis can save substantially on expensive equipment such as engines, gearboxes and axles," he said. "It is an important part of our preventive maintenance programme."

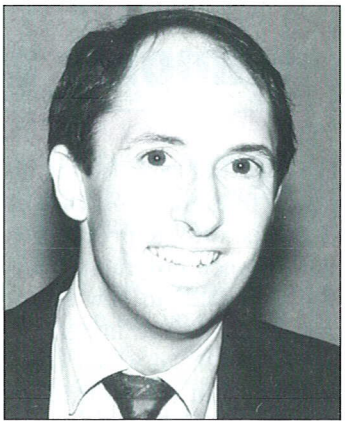
Ikhwezi Transport has a fleet of 236 buses which will be expanded on demand. The fleet will generate at least 100 oil samples per month.

New IS manager

GARY DORMAN, Wearcheck's new information systems manager, is well equipped to undertake the strategic planning of Wearcheck's information systems.

He has a strong background in all facets of information systems, from developing airborne navigation systems to Local and Wide Area Networks (LAN/WAN) implementations, as well as extensive programming experience.

After graduating from the University of Natal (Durban) with an MSc degree in electronic engineering, he spent five years at Durban-based military communication systems specialists, Barcom. Starting as an engineer, he moved into marketing and then into information systems.



Gary Dorman

During a five-year stint as information systems manager for Eskom, he completed a part-time MBA degree through the University of Durban-Westville.

Planning

"Accurate advance planning of information management is essential for maintaining a competitive edge in this era of rapid technological progress," he says.

Gary views his appointment as an exciting challenge. "One of Wearcheck's objectives is to develop a standardised information management system by sharing expertise and technology with our associate companies around the world. This will enable us to stay ahead of the field in oil analysis technology."

Strong demand for training

WEARCHECK's technical training courses continue to be popular with customers who would like their staff to gain a thorough understanding of oil analysis.

This schedule shows the courses to be held at Wearcheck's offices in Pinetown and Johannesburg for the remainder of the year. For bookings, please telephone Melanie Hynd on (031) 700-5460 or Rina Vice on (011) 455-3342.

Date	Course	Venue
12 July	2	Pinetown
13/14 July	3	Pinetown
14 August	2	Johannesburg
15/16 August	3	Johannesburg
13 September	2	Pinetown
14/15 September	3	Pinetown
9 October	2	Johannesburg
10/11 October	3	Johannesburg
15 November	2	Pinetown
16/17 November	3	Pinetown

Course 2: The applications of oil analysis and an introduction to trouble-shooting.
(8h30-16h30) Cost: R300 incl. VAT
(Wearcheck customers); R414 (others).

Course 3: The technical management of oil analysis and lubrication.
(One and a half days) Cost: R575 incl. VAT
(Wearcheck customers); R745 (others).

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