

International praise for lab accuracy

CONSISTENT accuracy of laboratory test results has won international praise for Wearcheck.

The company is one of 33 laboratories in Europe, Africa and the Middle East which participate in a quarterly sample verification programme run by Geneva-based Caterpillar Overseas, part of the US multinational Caterpillar group.

Wearcheck was appointed the official Caterpillar laboratory for Southern Africa in 1989 and has been on the international programme since then.

Four certified samples are sent quarterly to each laboratory to be tested for eight elements: copper, iron, chromium, aluminium, lead, silicon, sodium and molybdenum.

OUTSTANDING

Hans Eichenberger, marketing consultant for lubricants and oil analysis at Caterpillar Overseas, says in a recent message to Wearcheck: "Reviewing your results from the last four exercises, they are, in my opinion, absolutely outstanding."

"We do not have a scoring system, but if we did the Wearcheck laboratory would be among the top scorers."

Wearcheck technical director Lesley Crawford says: "We have always prided ourselves on the reliability of our results, and we are particularly pleased to have received international recognition for our high standards."

"With the massive capital cost of modern trucks and earthmoving equipment, accurate diagnosis is essential. Oil analysis is an extremely cost-effective tool when analytical laboratories maintain the highest standards."

Mr Eichenberger says: "To achieve such accurate results it is essential to have qualified people and up-to-date, latest-technology

laboratory equipment. I know you have those requirements, because I had the opportunity to visit your laboratory in Pinetown."

He says Caterpillar Overseas introduced oil sampling in 1971 and today 700 000 samples are analysed each year. Worldwide, Caterpillar oil samples top 5 million annually.

● Dries Prinsloo, marketing manager (parts and service) at Barlows Equipment Company writes:

"We would like to congratulate Wearcheck on excellent and consistently accurate results achieved by your laboratory in the Caterpillar verification programme."

"This quality service creates a great deal of confidence in the SOS/Wearcheck programme which benefits both parties and ensures the customer receives the best possible service."



CREATIVE use of computer technology has enabled Wearcheck to develop a new-look double-sided laser-printed sample test report which includes graphics and high-visibility prompts when results are out of line.

The new report with clearly presented test results and diagnosticians' comments, is designed to facilitate more effective maintenance and to help streamline maintenance management.

Discussing a recent test report on one of their engines awaiting overhaul in the Isipingo workshops of Unitrans Sugar are workshop foreman Dan Naicker and technical manager Keith Pick — see Page 3.



INFLATION BUSTERS!

— Page 2

Massive computer boost

TWO major advances in Wearcheck's information processing capabilities — reflecting an investment of more than R500 000 — are set to come on line in March and April 1993.

The company is installing an Olivetti LSX 6520/2 computer system, built by Pyramid Technologies of San Francisco, to replace its existing five-year-old system.

And it is launching a major rewrite of the Infocheck package which allows customers nationwide to access the Wearcheck mainframe from personal computers.

Wearcheck computer chief John Wasserfall says the new computer will have about 80 times the power of the old system and will be much faster, thanks to state-of-the-art symmetrical multiprocessing.

With widespread duplication of com-

ponents, the system will be almost fault tolerant — which minimises the chance of downtime.

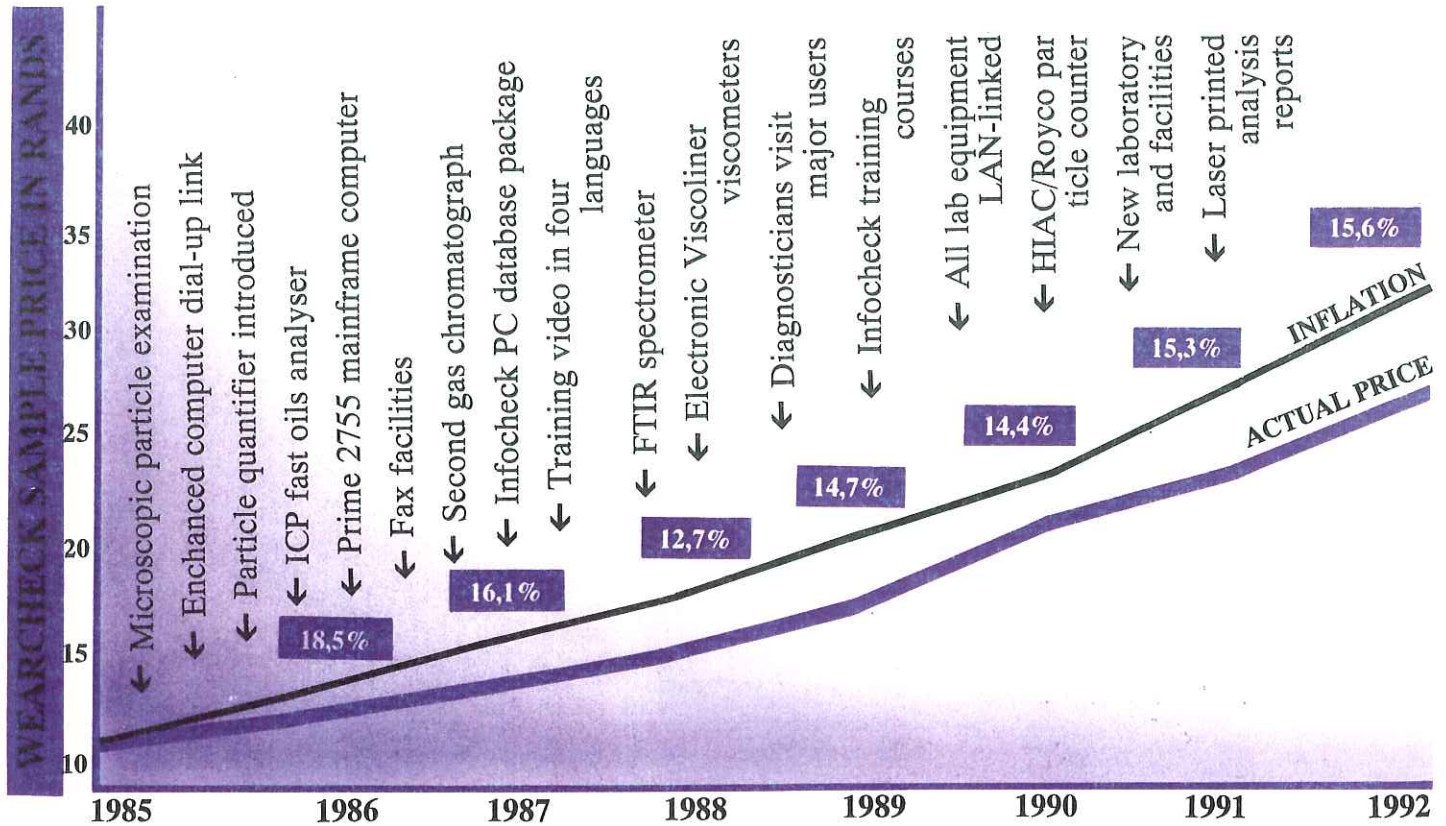
Apart from the greater speed, the change will be transparent to Wearcheck users — but there will also be a change to the Unix operating system, which promises enhanced compatibility with customers' computer systems.

Mr Wasserfall says the new system paves the way for greater productivity and further development of Wearcheck's capabilities.

Infocheck is being rewritten for compatibility with DOS-based software and to allow multi-user applications, following requests from several big users.

And with the increased speed of the new Wearcheck computer, Infocheck users will cut costs through shorter connect times.

INFLATION BUSTERS!



The graph contrasts Wearcheck's actual prices since 1985 (lower line) with prices based on ruling rates of inflation. Not only has Wearcheck consistently avoided inflation-linking — it has also dramatically expanded its technical and information handling skills to ensure the best possible service for customers.

TECHNICAL NOTEBOOK

Instruments of saving

WEARCHECK'S investment in sophisticated laboratory equipment and its great attention to detail continue to produce major savings for customers by uncovering hidden problems.

And long-standing supporters of the Wearcheck programme have heartily endorsed the acquisition of state-of-the-art laboratory instruments which broaden the scope of oil analysis.

Two such instruments are the FTIR spectrometer — which features in the following case study — and the HIAC/Royco particle counter. Both help to pinpoint severe problems which may not always be apparent in conventional oil analysis.

"These instruments now undertake some of the routine condition monitoring tests performed on all oil samples passing through our laboratory," says Wearcheck technical director Lesley Crawford.



JACK DENZ

Long-time customer Jack Denz, technical director of Grinaker Construction's plant company, says the Wearcheck oil analysis programme brings savings conservatively estimated at more than R1 million a year for his company.

Mr Denz says: "Over the years Wearcheck analysis has become more comprehensive with the increasing sophistication of their laboratory equipment.

"Each advance in the laboratory

increases our potential for greater savings.

"Significantly, the cost of Wearcheck oil analysis has risen slowly compared to the growth of its benefits."

He says: "A recent analysis using Wearcheck's FTIR spectrometer uncovered a severe problem in one of our machines' engines and showed how modern techniques can highlight problems lurking behind otherwise acceptable test results."

Cummins 4BTA engine

Results of tests on three samples of oil taken from an engine that had been overhauled at 3 009 hours:

	Oil service (hours)	Viscosity (at 40°C)	Oxidation (by FTIR)
1	119	103,7cSt	15
2	166	103,1cSt	28
3	222	116,9cSt	46

Oil in use was Shell Rimula X 15W/40 with a typical viscosity of 101cSt at 40°C.

The oxidation level rose quite rapidly in sample 2 indicating possible overheating, but there was no increase in viscosity. The client was advised to check for slight overheating, but no faults were found.

Sample 3 indicated a definite overheating problem with a high oxidation level and an increase in viscosity from the thickening effect of the resins formed by oxidation.

However, without the FTIR oxidation determination, the overheating problem would have been less obvious because a 16% viscosity increase after 222 hours' service would be acceptable.

Technical staff subsequently found excessive radiator temperature differentials, stemming from inconsistent air flow through the radiator.

'Soft tools' raise maintenance skills

WIDESPREAD calls for training in maintenance management has prompted Maintech to provide an introductory course in predictive maintenance methods.

Pre-requisites imposed by industry were that training had to be applicable to the work of artisans and engineers, technical but understandable — and broad enough to cover a variety of topics.

This has resulted in a comprehensive collection of "soft tools" which, if not making the man an expert, at least enable him to recognise where a particular method will work and to contact the right people.

Introductory sessions cover analysis of existing maintenance systems and production requirements, leading to determination of

Forthcoming Training Courses 1993
Practical Predictive Maintenance
 April 22-23 — Johannesburg (Houghton)
 May 11-12 — Durban (Pinetown)
Vibration Analysis
 May 3-5 — Durban (Pinetown)

optimal maintenance plans for critical machines.

Bulk of the training covers condition monitoring including vibration analysis, oil analysis, thermodynamic pump efficiency testing, non-destructive examination and thermography. Specific theoretical training is given on machine balancing and lubrication principles.

Short modules can also be included to cover special needs:

one client requested a focus on pump and generator testing.

"Practical Predictive Maintenance" is presented regularly in Johannesburg and Durban, and courses are also being run in-house for major companies. The course is the first step to proficiency in predictive maintenance and it can be supplemented with Maintech's detailed course on vibration analysis.

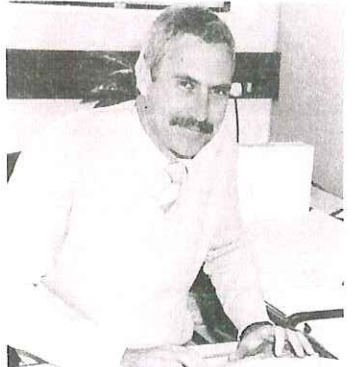
Wearcheck launches plan for Comrades

WEARCHECK will be taking a close interest in this year's running of the annual Comrades Marathon between Durban and Pietermaritzburg.

Apart from cheering on computer chief John Wasserfall, who will tackle the gruelling route for the fifth time, Wearcheck has offered complimentary pre-race transport from a central point in Durban to the starting line for customers' employees who have entered.

Wally Crawford, managing director of Wearcheck, says: "We have also applied to run one of the refreshment tables on the route, giving our staff a somewhat different way to help keep things running on the road."

John Wasserfall's involvement



JOHN WASSERALL

with Comrades goes back to 1982 when, as software manager for CDS, he assisted Hulett Aluminium's early attempts to computerise the race on a Prime computer.

From 1984 to 1990, John's software was used to record finish times, allowing multiple finishing lanes for the first time. He also wrote the interface for SABC TV, which enabled TV character generators to display runners' identities and the leader board.

The program also gave radio commentators and sportswriters instant access to race data — and allowed the race organisers to operate a public enquiry area at the finish.

Off to premier show of lab gear

PACKING for Pittcon are Wearcheck directors Wally and Lesley Crawford who will visit the premier showcase of international analytical equipment in the United States in March.

Pittcon — the annual Pittsburgh Conference — is to be held in Atlanta, which is also the home of Spectro Metrics, originator of the Wearcheck name.

Coinciding with Pittcon and hosted by Spectro Metrics will be a gathering of directors from each of the independent laboratories licensed to use the name "Wearcheck". These are: Wearcheck (South Africa), Alpha Maintenance Systems (Belgium), Australian Laboratory Services, Oiltech Analysis (Spain), Simon Laboratories (United Kingdom), Wearcheck (Canada) and Wearcheck (Germany).

The Crawfords will be looking at Pittcon for the latest instruments for oil analysis and will focus on debris analysis techniques.

New-look test report

WEARCHECK

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Mr J Citizen
A B C Trucking
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Anytown
0000

Vehicle : LMP9
Alt id : FLEET09
Model : CATERPILLAR 428
Site : WESTMEAD

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Gordon View - 2047
Tel: 011016 5200
Fax: 011016 5203

Cape Branch: P O Box 189
Santalush - 732
Tel: 021048 5700
Fax: 021048 5700

Problem severity		RRZ
severity	samples	
1	250	250
2	250	250
3	250	250
4	250	250
5	250	250

Code : LABCAN	Component : ENGINE
Model : PERKINS 4CYL	Oil : CALTEX RPM DELO 350
Diagnostician : GARY BROWN	

DIAGNOSIS	TROUBLE SHOOTING	FUEL
<p>5) 8061206 19.08.92 smr 4568</p> <p>Piston, ring and cylinder/liner wear rates are high. 6% Fuel dilution taking place - check injectors and pump calibration. Check compression and blow-by. Check that blow-by is not excessive. Fuel dilution and decreased viscosity made the oil unfit for further use. This component needs urgent attention - investigate immediately. Please return feedback card. Please refer to fax.</p>	<p>Fuel System Checks:</p> <ol style="list-style-type: none"> 1. Fuel leaks - present 2. Leaking fuel injectors 3. Faulty interlocks 4. Worn or faulty 5. Pump calibration 6. Governor 7. Excessive 8. Low 9. Air 10. ... 	

DIAGNOSES	COMBUSTION	VISCOSITY																								
<p>1) 7876192 20.05.91 smr 5329</p> <p>Piston, ring and cylinder/liner wear rates are high. 6% Fuel dilution taking place - check injectors and pump calibration. Check compression and blow-by. Check that blow-by is not excessive. Fuel dilution and decreased viscosity made the oil unfit for further use. This component needs urgent attention - investigate immediately. Please return feedback card. Please refer to fax.</p>	<p>key: good [] poor []</p> <p>Combustion efficiency</p>	<p>Wear rates are normal</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>Phosphorus</th> <th>Iron</th> <th>Sulphur</th> <th>TBN</th> </tr> </thead> <tbody> <tr> <td>967</td> <td>1017</td> <td>0</td> <td>11093</td> </tr> <tr> <td>971</td> <td>1321</td> <td>0</td> <td>18447</td> </tr> <tr> <td>2268</td> <td>1135</td> <td>0</td> <td>15088</td> </tr> <tr> <td>1514</td> <td>810</td> <td>730</td> <td>4</td> </tr> <tr> <td>1654</td> <td>807</td> <td>711</td> <td>11036</td> </tr> </tbody> </table>	Phosphorus	Iron	Sulphur	TBN	967	1017	0	11093	971	1321	0	18447	2268	1135	0	15088	1514	810	730	4	1654	807	711	11036
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GRAPHICAL REPRESENTATION OF KEY DATA

<p>Iron</p>	<p>Oil in service</p>	<p>Chromium</p>	<p>Aluminium</p>
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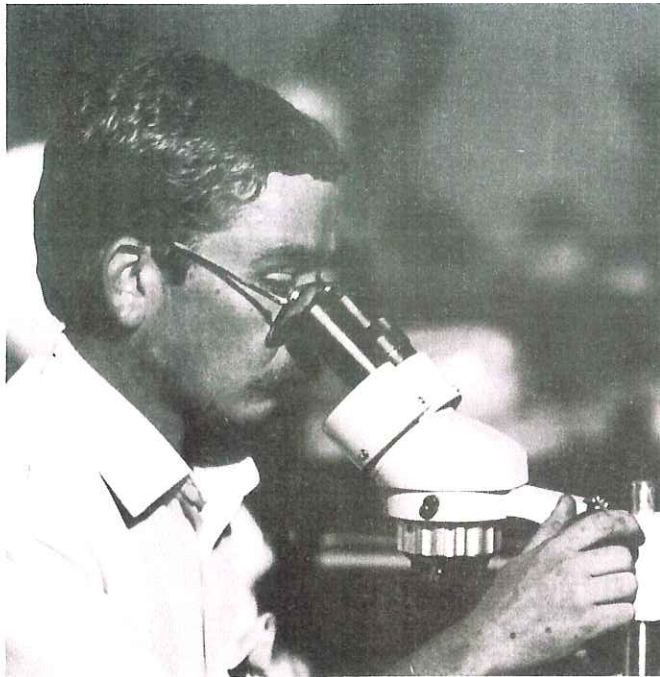
Diagnostics goes 'cosmo'

BORN in Buckinghamshire and brought up in Jamaica, Botswana and South Africa, John Evans brings a cosmopolitan air to the diagnostics department at Wearcheck.

After completing his schooling in Johannesburg, John obtained a B.Sc in chemistry from Southampton University before heading back to Southern Africa.

While visiting his parents in Botswana in 1983 he spotted a brief newspaper advertisement for someone to run an oil laboratory. He applied, got the job and found himself setting up an analytical laboratory for the local Barlows company.

In 1985 he set up a second laboratory for a sister company in Harare and in 1986 he was back in Botswana to establish laboratories on the remote Jwaneng and Orapa diamond mines. This role included



JOHN EVANS

analysis, diagnosis and aspects of maintenance planning.

By 1989 he was ready for a change of scene and joined Wearcheck where he was able to apply his knowledge of chemistry and experience of big diesel engines and transmissions as a diagnostician.

Over the past few years John has added the diagnostic comments to thousands of Wearcheck oil sample reports and has also been heavily involved in the company's long-distance diagnosis service — where rapid computer links enable Wearcheck to provide diagnostic back-up to remote analytical laboratories.

What makes a good diagnostician in John's view? "An inquiring mind, a laid-back personality and a sense of humour."

John's outside interests include music, reading, bridge, photography and travel.

ENGINEERING CASE STUDY

'Pulpitations' under control

By MICHAEL PAUL

MAINTTECH's services have come to the fore in an unusual application — measuring pressure fluctuations in the pulp feed to a paper-making machine.

The problem machine was producing paper of uneven thickness, and the source of the variation was traced to the head-box which spreads pulp in a very thin layer on a moving gauze belt. The machine makes a continuous sheet of paper about six metres wide at speeds of 600 metres a minute, so the head-box must deposit a significant quantity of pulp at a steady rate and with no pressure fluctuations.

Initial measurements by a British firm of

consultants showed pressure fluctuations as high as 1 800Pa. Two sources were traced — a "fan" pump and a rotating screen which feed the machine and control fibre grade in the pulp.

The screen was adjusted during a maintenance shutdown and Maintech was called in to quantify effects of this work. A pressure frequency spectrum in the pulp line showed two "spikes" around 10Hz, corresponding with the two sources:

- 9,6Hz — twice the rotation speed of the rotating screen, showing the effect of the two moving foils which squeeze fibres through the screen.
- 9,8Hz — rotation speed of the fan pump,

suggesting the impellor was not symmetrical.

Amplitudes of pulsation were about 200 and 400Pa (rms) respectively — a significant improvement, according to Maintech's Mike Paul. He says: "This is close to an industry quoted ideal of 140Pa, which would be excellent in a machine of this age and design.

"An overhaul of the fan pump has been planned and then we expect another improvement.

"By that stage the predominant source may no longer be these components and mechanical vibration of the structure and pipework could become significant. That may require strengthening or isolating certain pipework from the head-box support."

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