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Editor:
Wendy Izgorsek

Design & Layout:
Adel JvR Bothma

Advertising Managers:
Helen Couvaras and
Heidi Jandrell

Circulation:
Karen Smith

Reader Enquiries:
Radha Naidoo

Publisher:
Karen Grant

**Editorial Technical
Director:**
Ian Jandrell

Quarter 4 (Oct - Dec 2014)
Paid circulation: 34
Free circulation: 4722
Total circulation: 4756



Published monthly by:
Crown Publications cc
Cnr Theunis and Sovereign Sts
Bedford Gardens
PO Box 140, Bedfordview 2008
Tel: (011) 622-4770; Fax: (011) 615-6108
e-mail: ec@crownc.co.za
admin@crownc.co.za
Website: www.crown.co.za

Printed by: Tandym Print

Electricity+Control is supported by:



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You may have noticed that Crown Publications has a new website. We have had an on-line presence since the 1990s, but recognised that with a rapidly growing number of on-line readers, both local and from outside the country, it was time to make a change. Crown's eleven publications serve the South African and broader African market.

On the day of the changeover we were delighted to see that more than 200 readers logged in and changed or re-entered their login details. I remind you that to read our magazines on-line, you need to be a registered on-line reader, and even if you were a registered on-line reader on the old site, in order to be able to continue to read on-line, you need to re-register. It is simple and it is free.

Go to www.crown.co.za - and follow the prompt to 'create account'. Once you are set up, you can login anytime. You can easily access E+C Spot On from the Crown Home Page, the Electricity and Control Home Page, or directly from www.eandcspoton.co.za.

E+C Spot On is a searchable repository of technical articles published in Electricity + Control, and is also the platform via which you can access any of the previous Electricity + Control FACE VALUE videos – which I continue to enjoy putting together with our media crew.

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Ian

Ian Jandrell

Pr Eng,
BSc (Eng) GDE PhD,
FSAIEE SMIEEE



John Gerritsma
Product Manager - Level

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PO Box 783905
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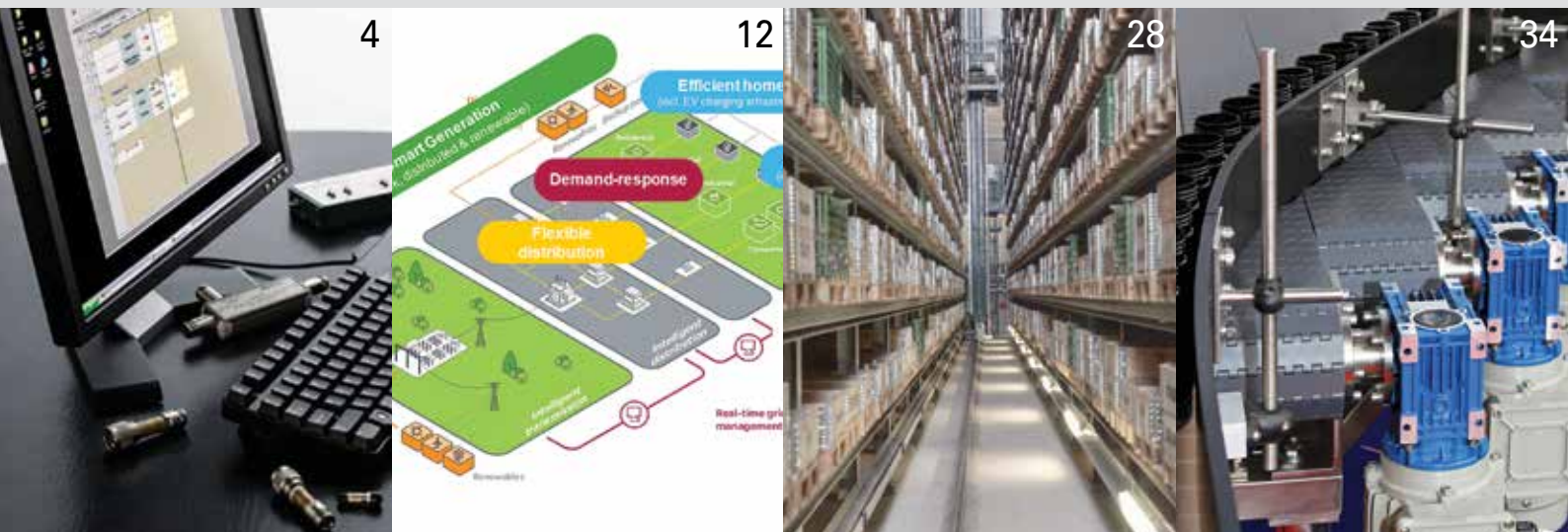
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Simple, accurate calibration instrument

By R Ainsworth, Fluke Calibration

An instrument that reduces complexity and calibration times, improving efficiency and increasing capacity over manual methods.



The Calibration 96270A RF Reference Source is the simplest, most accurate and cost effective single instrument for calibrating spectrum analysers and RF power sensors and more, up to 27 GHz. Its precision signal level and attenuation, high signal purity and precision low distortion modulation make this reference

source clearly superior to the general-purpose signal generators that are often used to calibrate spectrum analysers, RF power sensors, attenuators, and similar instruments. Its low phase noise provides superior phase noise performance. Unlike many RF calibration solutions, the instrument is designed specifically for RF calibration, with a calibration oriented user interface that makes it easy to learn and operate. The instrument simplifies and speeds up calibration procedures, reduces opportunities for operator errors, and greatly simplifies RF metrology.

At the core of an RF and microwave calibration system, the instrument covers more than 80 % of the test points required for calibrating almost all spectrum analysers of any frequency range.

For many spectrum analyser models operating below 27 GHz, you only need this instrument to perform the entire calibration. It is automated with MET/CALR Plus Calibration Management Software.

Key benefits

Covers a broad range of your RF workload with a single instrument

The instrument calibrates a broad workload of RF calibration devices, including:

- Spectrum analysers, including higher frequency models
- RF power sensors
- Modulation meters and analysers
- Measurement receivers
- Frequency counters
- RF attenuators and components
- High frequency oscilloscopes

The metrology associated with calibrating these items becomes simpler because you have fewer error sources





and uncertainty contributions to consider than with traditional RF calibration systems.

More than just an RF calibrator

Many applications in R&D, manufacturing test and ATE need better performance than a general purpose signal generator can offer. If wide frequency coverage, frequency resolution, low harmonics, phase noise and spurious content, signal level and attenuation accuracy, and/or dynamic range are critical parameters, this instrument is the ideal solution.

Cut the cost of your RF calibration system in half

As the central instrument in a high performance RF spectrum analyser calibration system, the instrument can cut your costs in half or even more. It replaces all of these parts of a 'typical' RF calibration system:

- Up to five signal sources (from audio/ function generators to RF and microwave signal generators and low phase noise sources)
- Power meters
- Power sensors
- Step attenuators
- Filters
- Pads
- Couplers
- 300 MHz frequency counter

It not only reduces the initial cost and time to purchase, install and configure RF system components, but it also reduces the costs to maintain and calibrate all of that equipment.

For many spectrum analyser models operating below 27 GHz, as well as for most power sensors, this can be used to perform the entire calibration. It is also easier to transport than a heavy rack of equipment and accessories, making it the optimum solution for on-site calibration.

AM	– Amplitude Modulation
ATE	– Automatic Test Equipment
DUT	– Device Under Test
RF	– Radio Frequency
UUT	– Unit Under Test

Abbreviations/Acronyms

- The instrument described calibrates a broad workload of RF calibration devices.
- As the central instrument in a high performance RF spectrum analyser calibration system, this instrument drastically reduces costs.
- 'What you set is what you get'.



No need for additional power meters, function generators or counters

The integrated dual power meter readout enables you to use the 96270A as a power meter and perform RF calibrations, without requiring a separate power meter. You can replace the 40 GHz power sensor included with the 96270A/HF model with a different compatible model, for power measurements at frequencies up to 67 GHz.

The 96270A Reference Source's internal modulation capability makes it suitable for applications that require precision modulation to be applied to the output signal, such as modulation analyser calibration and spectrum analyser sweep time testing using an AM signal with more accurate modulation rates. You do not need additional function generators as a low frequency modulation source—the 96270A delivers it all. The integrated 300 MHz frequency counter lets you reduce the number of instruments required for RF calibration even further.

Flexible configurations match your needs and budget

A variety of models, options and accessories enable you to purchase the performance you need, then add items later as your needs change and grow. The basic 96270A Reference Source comes with a 50 ohm leveling head. The 96270A/75 includes both the 50 ohm and a 75 ohm head.

The leveling head provides levelled, deep attenuation, modulation and low phase noise signals to 4 GHz, covering 80 % of the test points of any frequency spectrum analyser—including high frequency models—and for linearity calibration of power sensors. Signals at frequencies from 1 mHz to 27 GHz are also available from the 96270A front panel microwave output, at level accuracies comparable with most general purpose signal generators.

The 96270A/HF Reference Source includes a high frequency leveling kit comprised of a 40 GHz power sensor and Agilent 11667B splitter, plus a metrology-grade microwave cable and precision

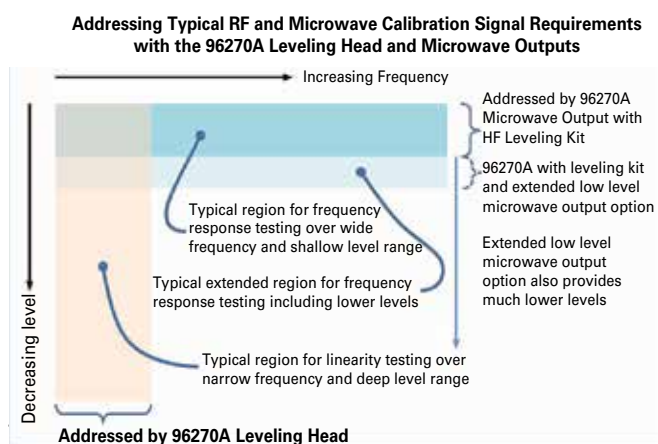
APC-3.5 millimeter adapter. This configuration, using the 96270A Microwave output, enables you to calibrate spectrum analysers, power sensors and high frequency oscilloscope bandwidths in the 1 kHz to 27 GHz range.

The power sensor and splitter provide the 96270A with fully automatic feedback that enables it to deliver precision, levelled, high purity signals, just as you set them on the front panel, at the splitter output port reference plane and UUT input connection.

Typical RF and microwave calibration signal requirements

In general, the signals required in RF and microwave calibration can be split into two ranges: at a relatively narrow range of lower frequencies over a wide amplitude range; and at relatively high amplitudes from low to very high frequencies. For example, frequency response calibration of spectrum analysers and power sensors is typically performed throughout the instrument's entire frequency range, requiring low and high frequencies. Usually these signals are only needed at relatively high levels. High frequency oscilloscope bandwidth testing requires high frequency signals, but also includes some lower levels. Linearity (scale fidelity) and attenuator accuracy calibration of spectrum analysers and linearity testing of power sensors are performed at relatively low frequencies over a very large amplitude range, often a dynamic range of 80 dB or more.

Typically the majority (over 80 %) of high frequency spectrum analyser test points are below 4 GHz. It is designed to optimally and efficiently address these differing requirements by delivering high purity wide dynamic range accurate level, attenuation and modulation signals via its levelling head at frequencies below 4 GHz; and delivering the higher level high purity signals from below 1 kHz up to 27 GHz via its microwave output. Adding automatic levelling feedback control with the high frequency levelling kit ensures precise signal levels are generated directly at the UUT input. Adding the low level microwave output option extends the dynamic range of the microwave output for applications such as HF oscilloscope bandwidth testing and others that require lower level signals.



extends the microwave output range from -4 dBm at the front panel connector (-10 dBm at the high frequency levelling kit splitter output) down to -100 dBm, for applications that require lower level signals at frequencies up to 27 GHz. This capability is invaluable for calibrating oscilloscopes, as well as for some spectrum analyser and power sensor tests.

The 96270A/LL/HF includes both the high frequency levelling kit and the low level microwave output, for the broadest possible workload coverage. The 9600FLT 1 GHz Wide Offset Phase Noise Filter accessory is designed specifically for high performance spectrum analyser wide-offset phase noise testing.

Even with the best low phase noise signal generators, technicians occasionally use filters during very high performance spectrum analyser phase noise tests to reduce noise levels at wide (high) offset frequencies and to improve test margins. The 9600FLT connects easily to the 96270A in either benchtop or rack-mounted applications.

The instrument can 'self-characterise' or profile its input to account for losses and attenuation of system components.

Designed for RF calibration

Many RF calibration systems are assembled with a mix of general purpose signal generators, power sensors, and other non-calibration-specific instruments. The 96270A, on the other hand, is designed specifically for RF calibration. Its user interface is designed to simplify processes for calibrating items such as spectrum analysers, RF level meters and receivers. Parameter offset, stepping, relative and UUT/DUT error readout modes allow you to work accurately and efficiently, following familiar calibration procedures.

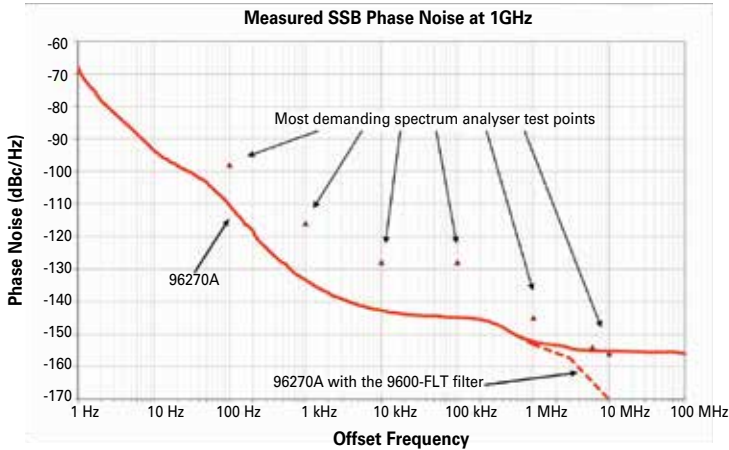
You'll find it easier than ever to determine the performance and tolerances of units under test. The 96270A front panel is equipped with dedicated function keys, context-sensitive softkeys, and a bright, easy-to-read colour display that make it easy to learn and operate. You can set output levels in terms of power (watts or dBm), voltage (RMS or peak to peak) using familiar multipliers and exponent forms. You can move easily between voltage, power and dBm units without losing entered values or accuracy.

In error readout mode to adjust the reading, simply rotate the spin wheel and the UUT error is displayed directly in dB, ppm or percent. The simple, calibration-oriented user interface also makes troubleshooting easier if you encounter an unexpected result or an out-of-tolerance condition while following a manual or automated calibration procedure.

Accuracy and signal purity

The instrument delivers pure, accurate level signals directly to the UUT input just the way you set them on the front panel. This unique

“What you set is what you get” feature helps you avoid losses, mismatch errors, and uncertainty contributions introduced by cables, other devices and interconnections, eliminating complex setups and time consuming methods otherwise required to obtain accurate results.



Conclusion

The 96270A can ‘self-characterise’ or profile its output to account for losses and attenuation of system components like cables, attenuators, splitters, and connectors, effectively creating a signal reference plane directly at the connection to the UUT input.

This frequency or amplitude level correction profile is saved into 96270A memory, which can store up to 30 profiles for different output and interconnection configurations.

Using a profile, the 96270A applies the level correction data automatically and delivers the user’s signal level setting accurately at the reference plane created at the UUT input.



Ron Ainsworth is the Business Manager for Process Calibration Tools at Fluke Calibration. After graduating with a degree in physics in 1998, he started his career in a primary temperature calibration laboratory in American Fork Utah. He has since had roles as a laboratory manager and marketing manager at Fluke Corporation. Enquiries: Twitter @theMetrologyGuy

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New sensor for temperature control of cement

Instrotech, local distributor of process control instrumentation and specialised systems, has announced the availability of the Optris CSmicro LT pyrometer, specifically for application in the measurement and control of temperature in cement manufacture.

Temperature is a critically importance component in the process of making of concrete, and specifically, the importance of controlling the temperature before the concrete is deposited. Optimal temperature of the concrete must fall within the range of +5 °C and +55 °C, a factor which greatly influences the final characteristics of concrete and performance (cracking, resistance and wear and tear). Concrete temperature is directly related to the development of strength and fresh concrete can be damaged when exposed to very low or very high temperatures. Key factors to control during the pouring of concrete related with temperature:

- Warm weather affects speed limits evaporation
- Cold weather inhibits the hydration process

The Optris CSmicro LT is equipped with an innovative, miniaturised stainless steel measuring head, the optimally suited for installation in limited spaces. Its small size and its temperature resistance up to 120 °C make the mechanic integration of the measuring head especially cost-efficient. The intelligent LED display works optionally as alarm signal, target support, self-diagnosis or temperature-code display. The placement of electronic components within the cable allows for a high temperature resistance of the measuring head. It measures temperature in the range of -40 °C to 1 030 °C; the spectral range is eight to 14 µm and the response time is 30 ms – 999 s. The unit can be optimally installed on cement pumps, mixer trucks and cement silos.

Enquiries: Scott Hunter.
Tel. 010 595 1831 or email
sales@instrotech.co.za



World's smallest IR camera

Optris, specialists in non-contact temperature measurement, have launched the OPRIS PI 640 - the smallest measuring video graphics array (VGA) infrared camera, worldwide. With an optical resolution of 640 x 480 pixels, the PI 640 delivers pin-sharp radiometric pictures and videos in real time.

With a body sized 45 x 56 x 90 mm and weighing only 320 grams (lens included), the PI 640 counts among the most compact thermal imaging cameras on the market. It can be delivered with industrial thermal imager equipment and comes with an extensive licence-free thermography software which enables users to monitor and document measurements and to edit infrared video imagery.

Key specifications of the PI 640 are its temperature range of between -20 °C and 900 °C, the spectral range of 7,5 to 13 µm and the frame rate of 32 Hz.

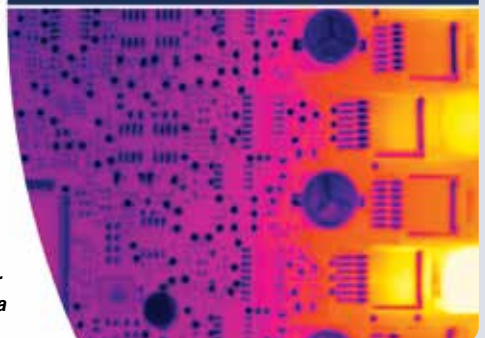
Enquiries: Scott Hunter. Tel. 010 595 1831 or
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New

PI 640

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Lab capacity boosted with new equipment

WearCheck, Africa's leading condition monitoring company, recently invested over two million Rand on brand new cutting-edge laboratory equipment. The shopping list included a new Gas Chromatograph (GC), a new Inductively Coupled Plasma spectrometer (ICP) and a new High Performance Liquid Chromatograph (HPLC). All the new equipment uses top of the range technology to ensure WearCheck's legacy of accuracy and reliability of sample results and diagnoses. While the company has already invested extensively in GC, ICP and HPLC technology over many years – the laboratory capacity has been significantly boosted with the addition of the latest testing equipment. WearCheck serves the earthmoving, industrial, transport, shipping, aircraft and electrical industries through the scientific analy-



sis of used oil from mechanical and electrical systems. Additional services include the analysis of fuels, transformer oils, coolants, greases and filters. The new laboratory equipment will benefit customers across all industries, and particularly transformer analysis. An expansive network now includes ten WearCheck laboratories spanning the continent and beyond, including Gauteng, KwaZulu-Natal, Mpumalanga Province, and international laboratories in India, Dubai, Ghana, Mozambique and Zambia - at Lumwana mine and Kitwe - with a presence in Cape Town, Rustenburg, Steelpoort, Port Elizabeth, Zimbabwe and Namibia. ICP spectrometry analysis provides high-speed detection and identification of trace elements at very low concentrations in oil to determine the levels of wear metals, contaminants and oil additives in lubricating oils. The ICP has been installed in WearCheck's Middelburg laboratory.

The HPLC separates compounds within a transformer oil sample, revealing the presence and quantity of trace degradation products, which in turn provides information on the operation of the transformer and whether there has been any breakdown of insulating material.

Enquiries: Tel. 031 700 5460 or email support@wearcheck.co.za

*Loshini Govender,
manager of WearCheck's
speciality laboratory.*



Turnkey lubrication systems for Kyrgyz gold mine

The **BMG Group** in conjunction with DRA Global successfully supplied and installed a mill lubrication system including Motor Control Centres (MCCs) and Programmable Logic Controllers (PLCs) for the Ball Mill at Kumtor Gold Mine in Kyrgyzstan. Jan Grobler, BMG National Product Manager: Instrumentation said: "Due to their extensive experience with mill control systems, system refurbishment and with BMG lubrication systems in particular, DRA Global were contracted to provide the MCCs and control solutions for the mills." One of the biggest challenges BMG faced for this project was the altitude (4 000 masl) and ambient temperatures which can reach up to -500 °C in winter. This required some unique design features to enable the system to operate efficiently and reliably. "Most mining operations established in the 1970s will soon be looking at equipment upgrades, and we believe that the BMG Group is well positioned to become the preferred supplier of quality mill lubrication systems in addition to our offering of professional technical support."

Enquiries: Jan Grobler. Tel. 011 793 5562 or email jang@bmgworld.net



Protection of field-based process instrumentation

A new high capacity, easy-access enclosure from Intertec provides plant engineers with a versatile alternative to free-standing cabinets for the environmental protection of field-based process instrumentation. Developed at the request of a Russian oil refinery, the enclosures are made from tough glass reinforced polyester (GRP) and include highly insulated options for use in extremely cold climates. They also offer more space than typical instrument enclosures, to allow plant personnel to use gloved hands when accessing the equipment. Typical applications include housing differential pressure flowmeters and process transmitters in refineries, petrochemical and chemical processing plants. The new enclosures are the latest addition to Intertec's Diabox range of instrumentation protection solutions, which are moulded two-part enclosures that open diagonally to provide easy access for operating and maintenance staff. The new Diabox 277 enclosure measures 600 x 750 x 600 mm (H x W x D) and has an internal volume of approximately 277 litres, depending on the level of insulation specified. Manufactured from a high-performance grade of GRP using a hot-press moulding process, the standard versions of the enclosure provide an exceptionally robust and rigid housing; they have a wall thickness of 6 mm yet typically only weigh 18 kg. The latest addition means that Intertec's Diabox range of enclosures now includes six models, with capacities ranging from 27 up to 277 litres, enabling plant designers to choose the optimum size for their application – for single or multiple process instruments.

Enquiries: Visit www.intertec.info

Cube-shaped process instrumentation sunshade

Intertec has launched a large cube-shaped sunshade for process instrumentation. It provides plant engineers with a highly



cost-effective means of shielding equipment such as electronic monitoring systems, explosion-proof junction boxes or analyser installations from solar radiation. Dubbed CubeShade, the protective cover measures 600 x 550 x 500 mm (HxWxD).

This provides a massive 165 litre capacity shaded environment that makes it easy to accommodate and protect large or multiple instruments, as well as simplifying maintenance access.

The new sunshade design is manufactured using an automated moulding process and offers a particularly economic solution for this common application.

Most process instrument sunshades on the market are relatively small and are often targeted at single instruments or small-scale field equipment installations.

If Intertec needs to provide solar protection for larger installations – such as two or three process transmitters – sunshades are usually

created to suit the specific application by building up multiple layers of glass reinforced polyester (GRP) in a custom mould to achieve the necessary thickness.

This manually-intensive process can increase costs significantly. If the number of sunshades required runs into hundreds – which is common for greenfield projects – the extra costs can be high.

Intertec's new CubeShade is constructed entirely from glass fibre reinforced sheet moulding compound (SMC). This combines chopped glass fibres, fillers, polyester resin and a catalyst in the form of a ready-to-mould composite that is ideal for low cost, high volume manufacturing.

The material has similar advantages to GRP for this type of application, including a high resistance to UV and corrosion from salt and common petrochemicals, and a low thermal conductivity, which helps to prevent heat generated by solar radiation being transferred to the shaded area. It also combines excellent rigidity and mechanical strength – for protection against impact – with a very low weight.

Enquiries: Email info@intertecinst.nl

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High availability and functional safety up to SIL3

The requirements on operational and safety-related circuits in plants are continuously growing which also affect the technical requirements on components. Often, functional safety can only be increased with much effort and at the expense of availability.

Proving that high safety standards and high availability can go hand in hand, Knick has introduced ProLine P 22400 passive standard signal isolators certified for applications with a SIL3 safety integrity level according to EN 61508. The passive isolator's safety functionality is the highly precise, linear transmission of 4...20 mA signals with a low transmission error of 0,08 % full scale. A high level of functional safety can be achieved even in single-channel structure and without diagnostics. For instance, sensors and actuators in safety circuits can be connected directly, requiring no elaborate evaluation equipment for redundant structures. The isolator's robust design ensures excellent availability with a mean time between failures of 965 years. Thanks to loop-powered operation, it contains fewer parts than devices with an auxiliary power unit and the total failure rate is decreased. Furthermore, it is mechanically stable, approved for marine applications, resistant against electromagnetic interferences, and boasts protection against electric shocks up to 600 Vac/dc through reinforced insulation. The test voltage during routine testing is 5,4 kVac. ProLine P 22400 is suitable for ambient temperatures between -40 and 85 °C. Knick provides a five-year warranty for all ProLine devices.

Mecosa is the sole agent for Knick Elektronische Messgeräte in Southern Africa.

Enquiries: Tel. 011 257 6100 or email measure@mecosa.co.za



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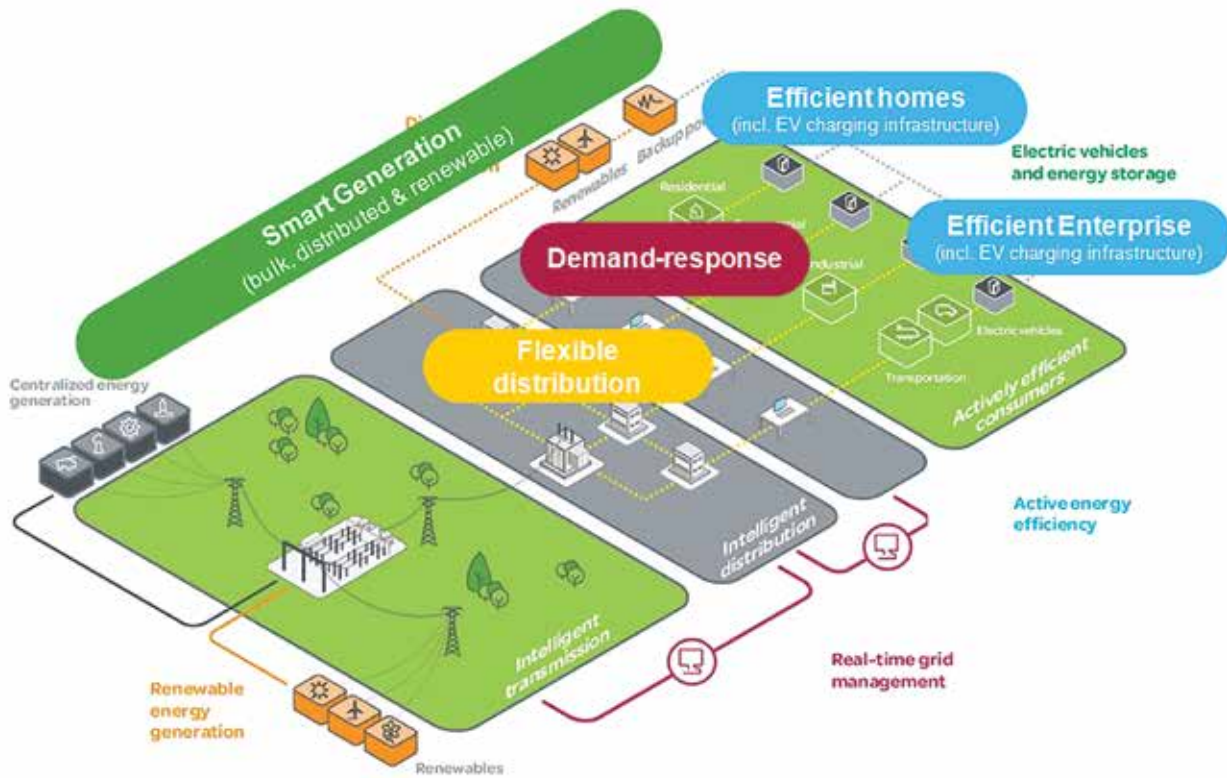
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Saving energy in the Smart Grid era

By M Clemence, R Coccioni and A Glatigny, Schneider Electric

How electrical distribution efficiency can be modernised to leverage the new promise of the Smart Grid while reducing distribution-related losses and associated costs.

Annual electricity distribution losses average 4 % in the European Union (EU). These losses represent € 7 bn in annual waste. New regulations are forcing electrical distributors to enhance efficiency across their networks. Network operators are challenged to integrate alternative energy generation and electric vehicles into their grids. All countries, including South Africa, can learn from this strategy for leveraging Smart Grid (SG) tools that are able to meet and exceed regulatory efficiency targets.

The European Energy Efficiency Directive 2012/27/EU [1], as it applies to distribution system operators, can be summarised as follows:

Regulatory challenges

Member states have enforced energy efficiency obligation target savings of 1,5 % each year for the time period ranging from 1 January 2014 through to 31 December 2020. Network tariffs will reflect network cost-savings. These savings will be achieved through both demand-side and demand-response measures and also through Distributed Generation (DG). This will include savings from lowering the cost of delivery of electricity or gas through investments in the distribution network or from network operational process improvements.

Concrete electrical efficiency measures and investments for improvements in network infrastructure will need to be identified by 30 June 2015. Tariffs will be set at a rate that will encourage suppliers

to improve consumer participation in system efficiency, including demand-response practices.

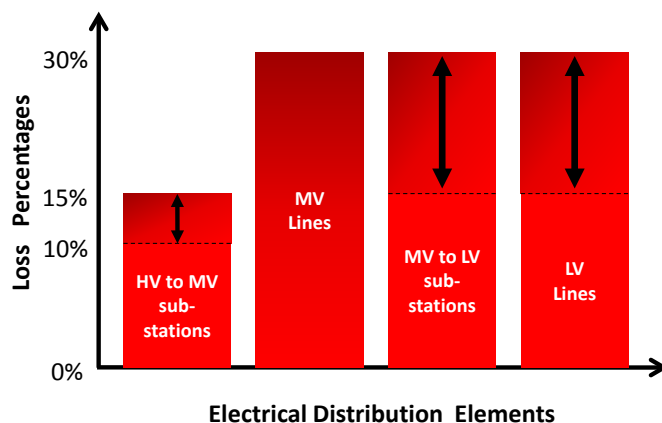


Figure 1: Distribution losses vary depending upon network configuration.

The following sections provide examples of best practices that can help distribution system operators cut costs and accommodate the regulations.

ADMS	– Advanced Distribution Management System
AMM	– Meter Data Concentrator
DER	– Distributed Energy Resource
DG	– Distributed Generation
DMS	– Distribution Management System
DSO	– Distribution System Operator
EU	– European Union
GOES	– Grain Oriented Electrical Steel
MDM	– Meter Data Management
PV	– Photovoltaic
RMU	– Ring Main Unit
RTU	– Ring Terminal Unit
S/S	– Substation
SAIDI	– System Average Interruption Duration Index
SAIFI	– System Average Interruption Frequency Index
SG	– Smart Grid

Abbreviations/Acronyms

Issue 1: Technical losses in MV lines

Active energy strategies for loss control

In Europe networks are configured in open loops and controlled in order to be able to isolate a fault and restore power (see Figure 2). The normal open points of the loops are strategically located to maximise the quality of service, i.e. low interruption duration (SAIDI) and low interruption frequency (SAIFI). However this strategy does not minimise losses.

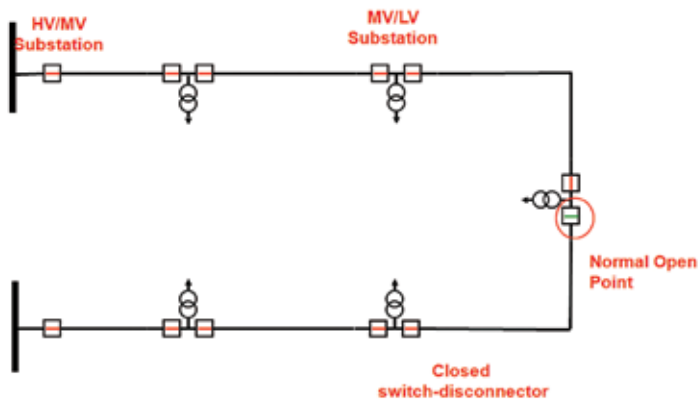


Figure 2: Diagram of a network configured in open loops and controlled in order to isolate a fault and restore power.

Strategy: Advanced Distribution Management Systems

Systems built to estimate losses, like Advanced Distribution Management Systems (ADMS), need a real-time network topology, network measurements, load profiles at MV and LV substations, and customer consumption information in order to determine the optimal location of normal open points. In this environment, when the system operator plans to open or close a switch-disconnector, the ADMS simulates the impact on reliability of supply, losses, and voltage management. Algorithms calculate optimum configurations on an hourly, monthly, seasonal, or yearly basis according to provided load curves, weather forecast, real-time data coming from sensors, smart meters, and number of switch operations (see Figure 3).

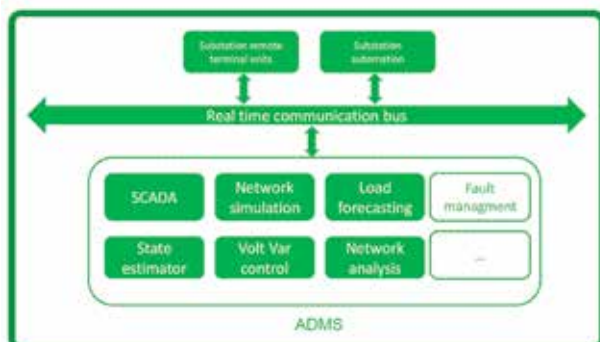


Figure 3: Simulation and testing is an effective method for reducing network energy losses.

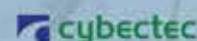
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Optimal locations of normal open points in a distribution grid (power flow) depend on the actual power demand in the grid (consumption). Power demand fluctuates throughout any given day and will also change with the different seasons. These load changes impact the optimal locations of normal open points. It is therefore necessary to use a grid reconfiguration application for testing multiple grid states and to deploy a solution capable of identifying the optimal locations of normal open switches. The proper radial distribution grid configuration will be achieved in accordance with pre-selected criteria and objectives.

Deployment of such a system can help minimise losses, minimise load unbalance in HV / MV sub-station transformers and feeders, unload overloaded segments of a network, improve voltage quality and achieve an optimal voltage profile.

However, the system can also be constrained by an infrastructure that limits the feasibility of switching operations and with infrastructure voltage and loading limits. Field pilot projects of such systems have yielded some interesting results:


- Losses may be reduced up to 40 % in case of an hourly reconfiguration (However, this is not realistic in terms of the number of operations. Switch-disconnector equipment is designed to respond to actual needs, such as 1.000 operations per lifetime of the device. Hourly reconfiguration would require 200 000 operations during the lifetime of the device)
- Losses can be reduced 20 % on a weekly reconfiguration basis (i.e. 50 times a year)
- Losses can be reduced to 10 % on a seasonal reconfiguration basis (i.e. four times a year)
- Losses can be reduce to 4 % in case of yearly reconfiguration

**Issue 2:
Impact of DER on voltage management**

One of the main responsibilities of utilities around the world is to maintain voltage limits as agreed to via contract with their customers (i.e. within +/- 10 % of agreed to target).

Voltage control is traditionally performed by transformers, using on load tap changers and capacitor banks that inject reactive power into the grid at the HV/ MV sub-station level. The DSO fixes a set-point and prepares scenarios and ranges based on seasonal load curves, for example. As a result of the massive injection of DER requirements onto the grid, voltage management now presents DSOs with a major challenge.

- Annual electricity distribution losses average 4 % in the European Union.
- Member states have enforced energy efficiency obligation target savings of 1,5 % each year until the end of 2020.
- In addition, Distribution System Operators (DSOs) are tasked with finding new ways to integrate smart grid drivers and alternative energy generation at consumer locations.



take note

They now have to manage situations where voltage may be rising on one part of their grid while decreasing on another part. Thus, DSOs are deploying sensors to monitor the voltage all along feeders, new actuators that are able to regulate the voltage at different levels, and centralised or distributed intelligence to manage the macro voltage control.

Strategy: Fine tuned voltage control infrastructure

The monitoring of MV equipment in older substations is costly as it requires complex, intrusive methods. Thus, the ability to acquire accurate, 'real time' voltage measurements implies the deployment of new solutions and sensors to minimise long term global costs. A number of new solutions can be deployed to address this challenge. New capacitive or resistive voltage divisors can be inserted in cable connections at the transformer or Ring Main Unit (RMU) level. Another option is to utilise 'virtual sensors' capable of estimating or modelling the MV voltage based on other data that is easier and cheaper to measure.

For instance MV voltage may be estimated from LV through distribution transformers or from load currents through lines impedance modelling. Depending on the level of accuracy required, sensor and installation costs can be drastically reduced. Actuators, which are most often installed at the HV/ MV substation level (on load tap changers within HV/ MV transformers, capacitor banks and voltage regulators), can also be installed along MV lines or even further downstream. These new actuators are installed in smart transformers with up to nine taps. The transformers can use MV voltage to increase or decrease the LV voltage. They are actuated by contactors with an operation durability of more than 1 million operations. No maintenance is required. Reactive energy injectors can also be utilised at the DG level through insertion of dedicated devices or by using DG controllable inverters.

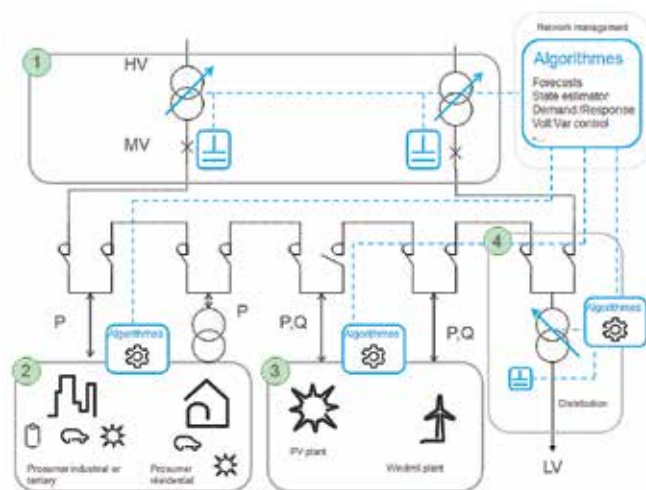


Figure 4: Voltage control aided by algorithms can help manage changes being brought about by increased presence of DER.

In the two cases described, the actuators must be managed together by new algorithms installed locally in primary or secondary substations and centralised in the ADMS at the control centre level (see Figure 4). This downstream voltage regulation must be coordinated with the legacy regulation at HV/ MV sub-stations through the ADMS system. This fine tuned voltage control infrastructure designed for DER integration can also be used to minimise technical losses. On a heavily-loaded network it can be used to operate at maximum voltage to reduce current flow at equivalent power and therefore reduce Joules losses along cables and transformers. Or it can be operated at minimum voltage on a lightly loaded network to minimise iron losses in transformers. It can also be used to minimise load peaks thereby reducing the need to use costly, high carbon footprint energy resources. These voltage management solutions have been tested in several pilot projects in Europe. DER integration on distribution networks can result in:

- Drastic reduction of PV disconnection
- Technical losses reduction in MV lines
- Reduction of load peak

Today it is both possible and prudent to plan, measure, and improve transmission and distribution efficiency.

Issue 3: Technical losses in LV lines

Technical losses on MV networks represent about 3 % of the distributed energy. Joules losses represent 70 % of these losses (but this is dependent upon the load rating of the network). More losses occur in the LV network. The LV ends of distribution networks are often heavily unbalanced between transformers (transformer to transformer), between LV feeders within a transformer, and between the three phases of one given transformer. These imbalances cause joules losses in wires and transformers due to higher current level on the more loaded part of the network and to current flow in neutral wires. These losses are estimated to be between 200 and 1 000 Euros per substation per year.

Strategy: Detailed analysis of MV/ LV level performance data

The daily load, voltage, power factor, and the temperature profiles of the sub-station and feeders are examples of data that can be gathered by the monitoring system. A chronological overview of events can be determined, such as the voltage duration curve, load duration curve per feeder, vector diagram for the diagnosis of unbalances per feeder and other values. These data points can then be formatted into customisable dashboards. In order to reduce the data volume that is transmitted from sub-station to the Distribution Management System (DMS), the curves can be calculated by local Remote Terminal Unit (RTU). This practice helps to avoid communication congestion (see Figure 5).

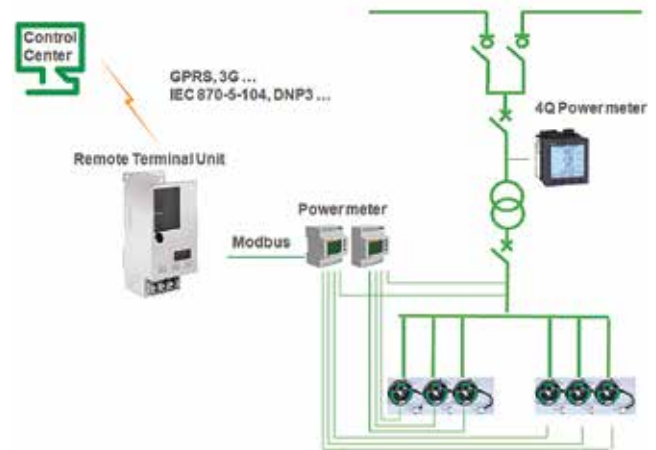


Figure 5: Data gathered from remote terminal units (RTU) can feed dashboards visible from the control centre or from other remote locations.

LV feeders are equipped with energy meters connected to the RTU in the substation. The system is able to calculate imbalances on LV feeders in real time (every 10 minutes on average) and to locate each LV consumer on the network, feeder, and phase. The re-balancing of loads is performed by repartition units installed along the network that switch a targeted customer from one phase to another. This particular architecture allows the network to accommodate more DER since it addresses the issues of load imbalance and helps to reduce energy loss. The switch from one phase to another can be either regularly scheduled (like once a year) or can be addressed on an ad-hoc, case-by-case basis. Benefits of deployment include an estimated cost reduction fuelled by reduced joule losses in cables of 200 to 800 Euros per year, and an improvement of sub-station power output of up to 30 %.

Issue 4: Non technical loss identification

Schneider Electric estimates that 90 % of non-technical losses occur in LV networks. Losses are assumed to range between 1 000 to 10 000 Euros per MV/ LV substation per year in European countries. Therefore LV networks are a top priority in terms of loss reduction. A first step in assessing the situation is to begin monitoring in order to determine how much loss is being incurred. In the past, LV networks were rarely monitored because, due to the high number of points to equip, monitoring was costly. Now, new approaches, architectures, and technologies allow for affordable and more precise monitoring.

Strategy: Smart metering deployment

Locating the sources of losses within the network is one of the first challenges. One solution for monitoring LV networks is to utilise smart energy meters as additional sensors to supply data regarding

the energy performance of the network. Under this scenario, the first step would be to determine the proper location within the network of each of these meters.

The next step would be to then equip each LV feeder with a meter. Care would have to be taken to install these meters without any outages to customers. It takes in the vicinity one hour per substation to install the energy management meters.

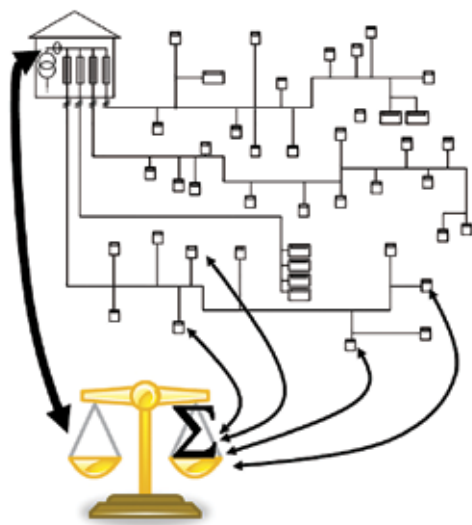


Figure 6: In this example, energy performance is determined by comparing aggregated energy consumption data from meters to energy output data from the LV feeders.

An additional step would be to compare the energy measured on the LV feeder with the sum of energies invoiced by the smart meters located across this same particular feeder network (see Figure 6). This action locates and quantifies losses, which then enables network operators to implement energy efficiency improvements. A variety of options exist for monitoring the system:

- At the local sub-station (S/S) level between the metering data concentrator (AMM) and the S/S RTU
- At the regional control centre level between DMS and Metering Data Management (MDM)
- Via the cloud as third party service

Schneider Electric field experience has shown that utilities that implement this approach for locating and quantifying losses have been able to detect significant losses.

In one LV network, for example, non-technical losses were located and identified among a pool of five to 15 end users and a loss as small as 100 Watts (the power of one light bulb) within a 630 kVA MV/LV sub-station was detected. This demonstrates the level of technical precision which is possible for both accurate location and measurement of energy losses. In addition to loss detection, the above smart metering approach also provides faster detection and location of outages on LV networks, which leads to an improved reliability

of supply. Neutral connection degradation can also be detected via voltage imbalances and this can help to prevent neutral cut out. In fact, the monitoring of transformer and neutral wire loads as well as load balancing across the network improves the quality of S/S asset management.

Passive energy loss control strategies

Issue: Inefficient transformers

Transformer losses in the EU electrical network are estimated to be in the range of 70 to 100 TWh at the current load factors. Distribution and power transformers represent around five million units. After power lines, distribution transformers have the second highest potential for energy efficiency improvement.

Strategy: Cut costs, losses with transformer technology upgrades

If we compare both transformers and overhead lines and cables, transformers are relatively easy to replace. In addition, modern transformer technology is capable of reducing transformer losses considerably.

Within the realm of transformers two types of losses exist: iron and copper losses. Iron losses are independent of the load and are called 'no load losses'. Copper losses are dependent of the load and are called 'load losses'. 'No load' or 'fixed' losses are present as soon as the transformer is energised. 'Load losses' vary according to the load on the transformer. Distribution and power transformers run 24 hours a day, therefore their energy efficiency can be impacted by reductions in both 'no load losses' and 'load losses'.

For utilities, it may be more advantageous to reduce iron losses than copper losses, since the transformers are energised 8 760 hours a year. These transformers typically do not supply load during this entire period and when they do supply load, it is never at the maximum load capacity.

On the other hand it may be advantageous for industrial applications to reduce the 'load losses', as these transformers are operated mainly at high load factor. Table 1 compares traditional or conventional transformers to new generation transformers (amorphous technology). The data concludes that loss reduction can be realised through upgrades to the newer technology. For example, new GOES transformers have 30 % less 'no load losses' compared to conventional GOES transformers. Even more loss reduction can be achieved with the amorphous technology (which can reduce losses by a factor of 2).

A0, B0 C0, D0, E0 no load losses categories are defined in EN 50464 [7], 'European standardisation for transformer losses reduction'. In Table 1, comparisons are made among conventional GOES, new GOES, and Amorphous transformers in the A0 category. Some manufacturers have successfully tested a complete range of amorphous transformers from 100 kVA up to 1 600 kVA in oil immersed. Several transformers have been installed in France, Germany and Belgium for more than a year with positive results.

Table 1: Losses comparisons of conventional, New GOES and amorphous transformers.

Rated power	Technology	No load losses level	Load losses level	No load losses (W)	No load losses reduction
400 kVA/Oil immersed	Conventional GOES	A0	Ck: 4 600 W	430	0 %
400 kVA/Oil immersed	New GOES	A0+	Ck: 4 600 W	300	30 %
400 kVA/Oil immersed	Amorphous	A0++	Ck: 4 600 W	< 200 (160)	63 %

Table 2: Cost comparisons of conventional amorphous transformers.

Rated power	No load losses level and value (W)	Load losses level and value (W)	Efficiency (n)	Purchasing cost (W)	No load losses cost (€/W)	Load losses cost (€/W)	Total Investment (€)
400 kVA/Oil immersed	CO: 610 W	Ck: 4 600 W	98,71 %	7 250	8	1	16 730
Conventional GOES							
400 kVA/Oil immersed amorphous	AO++: 200 W	Ck: 4 600 W	98,81 %	1 0125	8	1	16 325

Conclusion

As a result of recently announced government mandates in the EU, DSOs will need to improve the efficiency (lower the loss rates) of their electrical distribution networks by 1,5 % each year. In addition, they are tasked with finding new ways to integrate smart grid drivers such as electric vehicle charging stations and alternative energy generation (wind, solar) at consumer locations. Today it is both possible and prudent to plan, measure, and improve transmission and distribution efficiency. Improvements can reduce operations cost by enabling the installation of equipment and software that communicates and integrates throughout the distribution path.

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Michel Clemence is a Senior Innovation Project Manager at Schneider Electric's Smart Infrastructure business unit. He holds an engineering degree from the Ecole Catholique d'Arts et Metiers in Lyon, France. He manages innovative design, a customer-centric development process focused on creation of new markets and 'disruptive' applications.



Renzo Coccioni is Industry and Government Relations Director at Schneider Electric's Energy Division. He holds a degree in electrical engineering from the Swiss Federal Institute of Technology Zurich (ETH). He was Unit Managing Director of Alstom/ Areva T&D in Linz, Austria, before moving to central business functions to lead Marketing of Medium Voltage products.



Alain Glatigny is Innovation and Smart Grid Vice President at Schneider Electric's End User business unit. He manages offer solution creation for the utility segment and addresses the Smart Grid topic from a field, feeder automation, substation automation, and IT/OT control centre perspective. He graduated from SUPELEC, Paris with a degree in engineering and holds a Masters degree in strategic management. Enquiries: Ntombi Mhangwani. Tel. 011 254 6400 or email ntombi.mhangwani@schneider-electric.com

Competitive edge for the furniture industry

The theme of automation has been one of the core issues in the furniture industry for years. In the context of Industry 4.0, it has become the focus of Ligna 2015, the world's leading trade fair of the wood and furniture industry: the notions of "smart factory" and "networked production" refer to intelligent, networked production systems that provide innovative solutions for the entire value chain in the furniture industry. With PC-based control, **Beckhoff** provides the basic technology for production concepts that are ready for Industry 4.0.

In the furniture industry, customer demands in terms of colours, shapes, haptic properties and materials are becoming more and more individual.

This presents major challenges for manufacturers, particularly in high-wage countries: the growing product variety, small batch sizes and short lead times have to be managed competitively, i.e. at costs that are comparable to mass production and with rapid availability, while at the same time focusing on optimised resource and energy efficiency.

The solution is provided by networked, intelligent production systems with a high degree of automation, i.e. a control concept that leverages the increasing convergence of information and automation technology and enables seamless communication.

Industry 4.0 increases the flexibility, efficiency, and sustainability of production through the networking of products, production resources and facilities along the global value creation chain. Here, PC-based control technology from Beckhoff is a key enabler: The PC as a control platform with open communication interfaces provides the prerequisites for an optimal implementation of the vertical and horizontal integration required for Industry 4.0 and the networked production.

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Local cable company now Level 2 B-BBEE

Established in 1967, **Alvern Cables**, privately owned business, began manufacturing a variety of low voltage electrical cables for domestic and industrial use.

In keeping with current policy in South Africa, Alvern Cables is delighted to announce a change in the company's shareholding. In addition to Laurence Hendy (Managing director), Willem Smit (Financial director) and Stephen Liasides (Commercial director), Jaycen Padiachy and Dorothy Botsi-Thulare are shareholders and members of the board – Jaycen has been appointed Works director and Dorothy – Executive director.

Jaycen has been a member of the Alvern team for the last twenty years. His hard work, loyalty and devotion to the company along with his dynamic abilities have earned him this well-deserved appointment.

A graduate of the University of the North and participant in a number of environmental law courses, Dorothy has been an admitted attorney – and partner – with Sim and Botsi Attorneys Inc for the last 15 years. She is also the chief executive officer of Botho Ubuntu Group which she describes as 'cleaning green'.

She has been acknowledged as 'Technology for Women in Business 2013' and recently she received the 'Enterprising Women Award 2015' in the United States of America. Dorothy's passion includes all things environmental. Asked how she feels about her Alvern Cables directorship, she responded: "It is a privilege to be part of this technical business.

"It's an opportunity for me to bring innovation into the company, develop people skills, ensure that environmental concerns are being addressed and identify leaders and future industrialists from disadvantaged backgrounds"

Alvern Cables Commercial director, Stephen Liasides, said: "We are happy with the new influences on the board and in the company and we are particularly excited about our recently acquired level 2 B-BBEE status."

These sentiments were echoed by a visibly optimistic and excited board poised to implement plans for their future growth.

Alvern Cables (Pty) Ltd has a fully equipped laboratory where stringent tests are carried out on all cables to ensure they meet the SABS requirements. Products are clearly labelled for complete control and traceability. Quality has been and will always be key to this group of individuals making it one of South Africa's leading cable manufacturers.

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Alvern Cables – Willem Smit (Financial director), Laurence Hendy (Managing director), Dorothy Botsi-Thulare (Executive director), Jaycen Padiachy (Works director) and Stephen Liasides (commercial director).

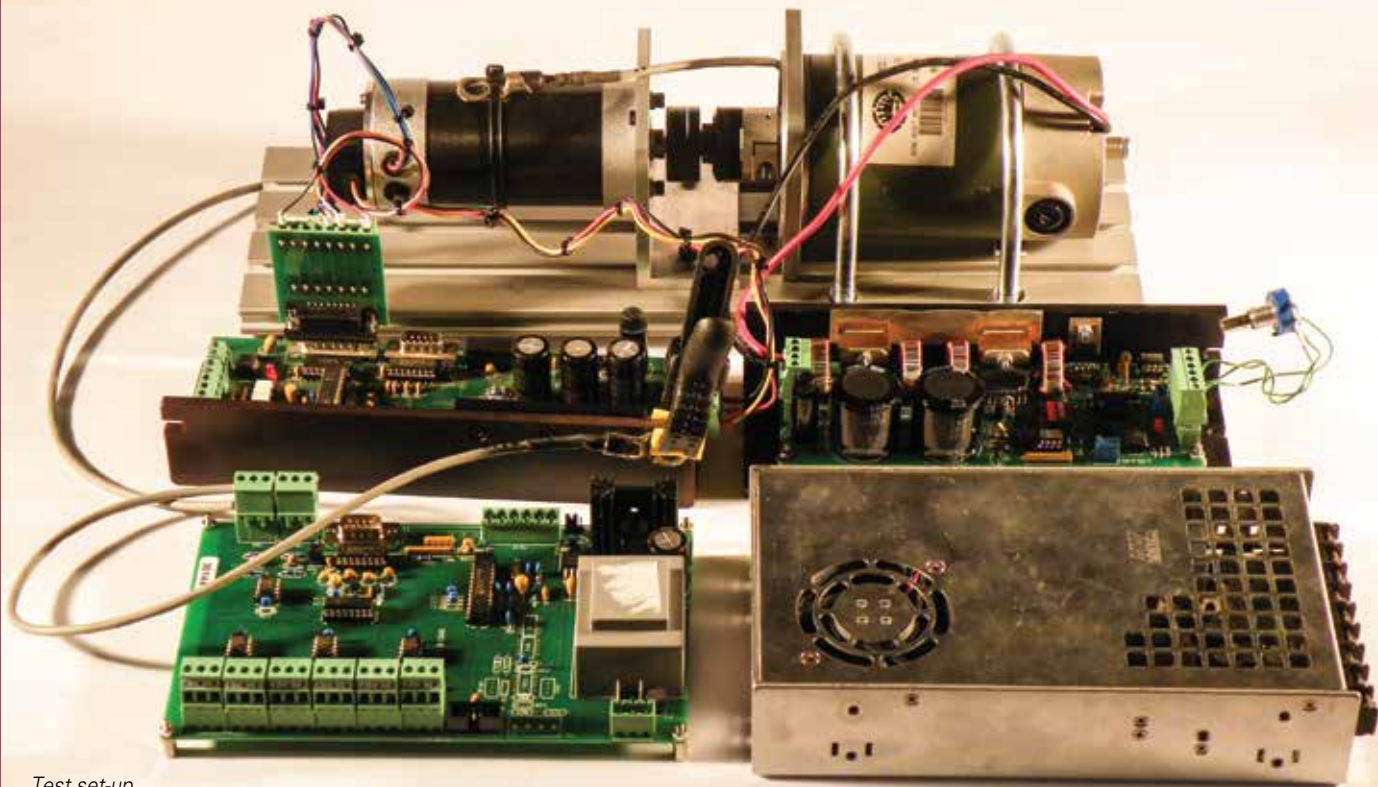
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Test set-up.

A bench top motor dynamometer for drive testing

By G Craig, Techlyn

Because stepper motors are current driven, even at standstill, testing has required only a test oscillator, power supply and appropriate motor. During a soak test, reliability and heatsink temperature could easily be assessed.

Techlyn has manufactured stepper motor drives since the mid nineties. Our new positioning drive for brushless (and brushed) servomotors created a testing problem. With these motors the drive current is proportional to the position error, so some method of loading of a rotating motor was required. A 'quick and dirty' test could be performed by using a lever on the motor output shaft at standstill. However, this would result in asymmetrical currents in the motor and drive.

Drive operating principle

Figure 1 shows the most important function blocks. The motor provides two feedback signals:

- Three magnetic Hall effect sensors to indicate when the three stator windings should change polarity in order to maintain rotation of the permanent magnet rotor
- An incremental encoder to allow high resolution positioning

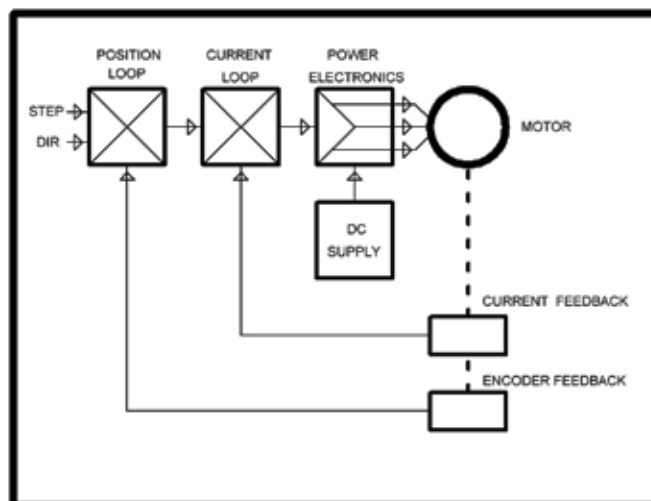


Figure 1: Most important function blocks.

AD – Analogue to Digital
 Dc – direct current
 PID – Proportional Integral Derivative

Abbreviations/Acronyms

The windings are driven by the switch output section which receives its command signal from a current loop. This prevents the drive from attempting to provide infinite output current in the event of a large position error. The positioning loop sets the final positioning accuracy by comparing the required position with the actual position.

The position error is computed by comparing the target position of a bi-directional input counter, driven by the step and direction signals with another bi-directional counter driven by the feedback encoder.

Controller filtering uses a PID (Proportional, Integral and Derivative) algorithm. My intention is to publish a further article to amplify the drive operation principles.

Dynamometer operation

(Refer to *Figure 2*) – this follows standard practice by coupling the motor on test to another motor which acts as a generator to load the test motor. In this case (see *Test set-up*) a suitable sized dc brush motor and motor drive were to hand.

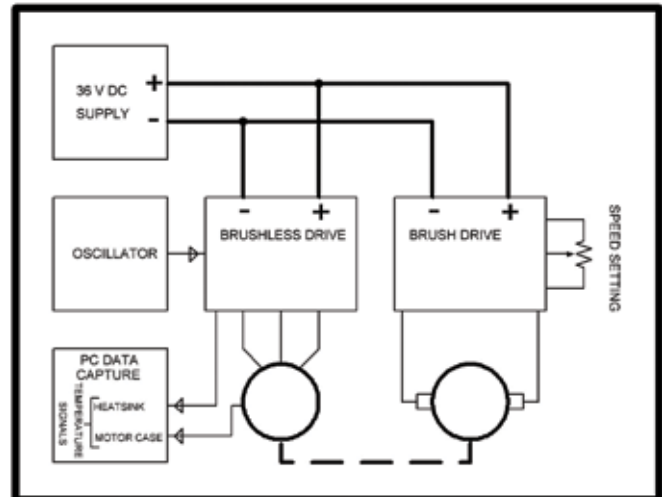
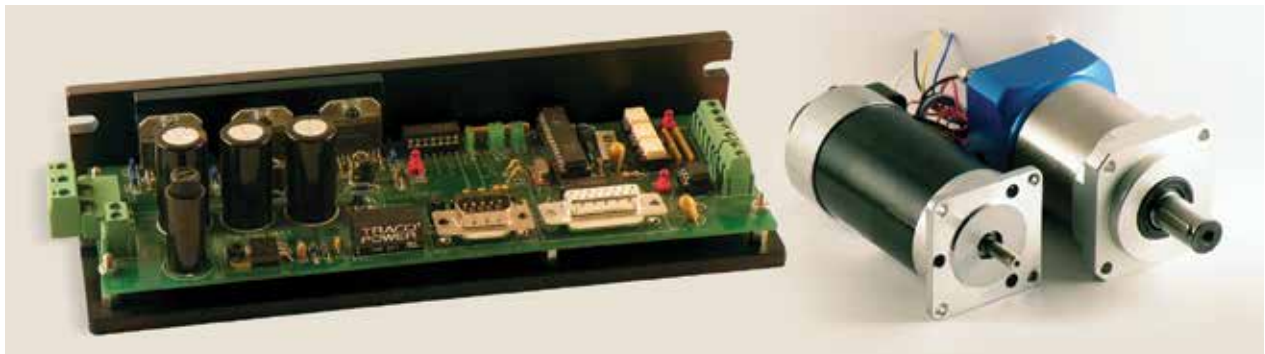


Figure 2: Test setup schematic.

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In operation the brushless motor was set to run at about 600 rpm. The brush motor was initially set to run at the same speed. Thereafter the brush motor was set to run slightly slower to run in the regeneration mode. The brushless motor was therefore continuously trying to speed up the brush motor. A clamp-on ammeter was used to measure the brushless motor phase current and the brush motor speed was set to a point where the brushless drive was fully loaded.

Techlyn has manufactured stepper motor drives since the mid nineties.

The energy recovered by the brake motor attempts to keep increasing the dc power supply voltage to store the recovered energy. Instead of a resistive power dump (and consequent power wastage) the drive supplies were paralleled and the dc power supply needed only

to supply the system losses. This is standard practice in the drives industry. The drive heatsink and motor case were fitted with LM35 sensors (10 mV/°C) and a 12 bit AD converter sent the temperatures at one second intervals to the data capture program.

'Makerplot' is a modestly priced easy to learn program, and *Figure 4* shows the resulting data. The red plot shows the drive heatsink temperature and the black plot shows the motor case temperature.

Conclusion

The plots show a rise of some 30 °C above ambient:

- The heatsink on the drive is designed to be conduction cooled by the cubicle chassis plate. In this case it was merely resting on the bench surface
- These types of duty cycles rarely occur in servo driven machines where high torque is only required during acceleration and deceleration

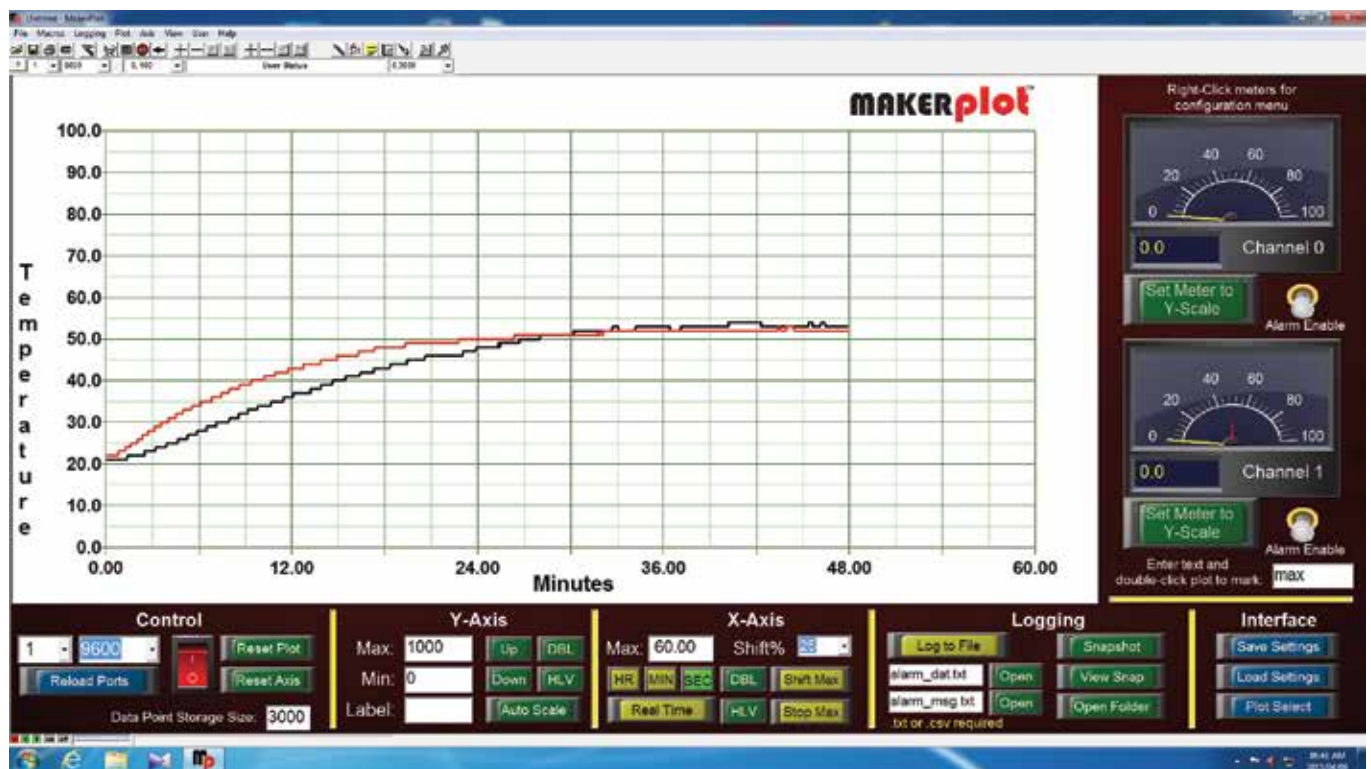


Figure 4: Plot showing temperatures versus time.

- Traditional stepper motors can be easily tested.
- Testing a positioning drive cannot be undertaken in the traditional way.
- A bench top dynamometer has been developed to allow full testing of a positioning motor.



Glyn Craig is a director of Techlyn and has been doing this kind of work since the seventies.
Enquiries: Email glyn@techlyn.co.za

Comprehensive repair service solution on rotating machines

The recent acquisition of CetusTurbo Machinery by leading electrical repairer of motors and generators, **Marthinusen & Couotts** (a division of Actom), will allow the company to offer all industries a comprehensive electrical and mechanical repair service solution on rotating machines as a single service provider.

"Being a single service provider with a market offering of this magnitude, our customers and potential customers no longer need to outsource refurbishments and rehabilitation of large equipment to different service providers," Mike Chamberlain, operations executive of Marthinusen & Couotts, says. "Our significantly expanded capability enables us to control the entire process, offering peace of mine coupled with optimised cost efficiencies, as the middleman is cut out completely." As a one-stop shop, Marthinusen & Couotts now operates five production workshops



covering 32 000 m² in southern Africa. This includes facilities in Cleveland, Benoni, Rustenburg, Kitwe, Zambia and the Cetus facility in Sasolburg.

Significantly, Cetus provides a unique set of mechanical turbine specialist skills which were previously not available within the group. Rebranded as ActomTurbo Machines, the new addition to the

Marthinusen & Couotts stable undertakes maintenance, general servicing, rehabilitation and refurbishment of all types of mechanical rotating equipment. Chris Bezuidenhout, founder of the original business, has been appointed managing director of Actom Turbo Machines, and believes that the strong synergies between the two businesses bode well for future growth.

Enquiries: Richard Botton. Tel. 011 607 1700 or email richardb@mandc.co.za

Fan compressors and pump motor protection

NewElec's KD and KE low voltage electronic motor protection relays find widespread usage in all industries where comprehensive motor protection is a must.

These relays are ideal when communications options are not required but excellent all round protection and motor management are nonetheless critical. From a safety view point the added earth insulation lockout, as well earth leakage protection will be a positive attribute.

The distinguishing benefits of these products include excellent earth leakage protection before the motor is started and while running, and power factor measurements for data leading to the improvement of motor efficiency.

The relays provide enhanced short circuit protection relating to power factor measurement, as well as statistical motor information pertaining to starts, trips, event records etc. The motor information can be downloaded. KD and KE relays feature use-selectable thermal curves, a full house of protection features including start per hour limitations and the possibility to communicate with the relay without opening the cubicle door via infra-red.

Enquiries: Toll assist: 0860 103041 or email sales@newelec.co.za



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Exclusive range of unbalanced motors for harsh conditions

Specialist vibrating equipment supplier **Joest South Africa** has launched an exclusive range of unbalanced motors specifically for Africa's harsh operating conditions. "Our philosophy of 'Engineered Solutions' ensures that we fully understand each customer's specific needs, delivering a customised solution, which ensures that downtime is reduced dramatically," Kim Schoepflin, Managing Director, says. The unbalanced motor range has been developed in partnership with the most established European-based vibrating motor manufacturer, which has over 55 years' experience in this field. "Our extensive operating experience and reference base in Africa allowed us to factor in various design improvements to extend the uptime on our customers' vibrating equipment, as well as improved ease of maintenance," Schoepflin says. The new IP 66-rated unbalanced motors feature enhanced water ingress protection, a rigid stator housing and an increased mounting area for more secure bolting. This is in addition to increased life and efficiency via the development of a replaceable stator pack, which removes the need for rewinding. Rewinding results in a loss of efficiency and thus reduces the life of the equipment.

"The overriding benefits are increased uptime, resulting in greater tonnage throughput, while ease of maintenance boosts the reliability," Theresa Walton, General Manager: Service at Joest, says. "We can confidently offer our customers up to two years' warranty on the proviso that they enter into a full vibrating equipment service agreement with us, which is also quite a benefit," Schoepflin says. The major advantage of such service contracts for our customers is that we are not just responsible for the maintenance, but are able to offer the whole package."

Enquiries: Kim Schoepflin. Tel. 011 923 9000. Visit www.joest.co.za



Voltage measurements – their importance in motor protection

Unbalanced voltages are unequal voltage values on 3-phase circuits that can exist anywhere in a power distribution system. Unbalanced voltages can cause serious problems, particularly to motors and other inductive devices. Typically, these voltages may differ by a few volts or more. When voltages differ excessively, problems occur. For general motor protection, it is always assumed that the system voltage is stable. This is due to legislations such as



NRS 048. This legislation is divided into several parts, mainly guiding the quality of the power supply (QOS), focusing on the voltage parameters, such as magnitude and dip time. However, during fault conditions the system is unstable and it is essential to know the voltage variation to comprehensively protect the motor. It is generally known that in a fixed power system, there is a 1 % increase in current measurement, therefore a 2 % increase in voltage. The sudden fluctuating voltage also contributes to deteriorating winding insulation in a motor, thus reducing the motor life. **NewElec** has relays such as its NewCode, KE range and others, that measure voltage to ensure comprehensive motor protection.

Enquiries: Toll assist 0860 103041 or email sales@newelec.co.za

Boosting skills in construction

Murray & Roberts Resources & Industrial and **Murray & Roberts Electrical & Control Systems**, located within Murray & Roberts' Energy & Industrial operating platform, are playing a major role in boosting skill levels in the South African construction industry. Both companies offer a total solutions approach in terms of electrical, instrumentation and mechanical engineering and construction. "The capacity and capability of our employees is fundamental to the strengths of our company and the larger role it plays in the South African construction industry," Khanya Magudulela, Human Resources Manager for Murray & Roberts Resources & Industrial, says. Both companies are actively involved with the Engineering Council of South Africa (ECSA) in meeting the growth and development targets of the Accelerated and Shared Growth Initiative of South Africa (ASGISA). "It is our aim to be an employer of choice in the engineering and construction sectors, as this will enable us to deliver a world class service. This is also a direct reflection of our diverse and experienced workforce," Amelia Phillip, Human Resources Manager for Murray & Roberts Electrical & Control Systems, says. Both companies' employee management approach is supported by policies, processes and frameworks that inculcate a culture which drives high performance while remaining compliant with all the necessary legislation and regulations. A key focus here is the companies' proactive environmental management policy to minimise any potentially negative impacts. In terms of health and safety, STOP.THINK.ACT.24/7 is the Murray & Roberts Group's global brand aimed at educating and motivating employees to take responsibility for their own and their colleagues' safety at home and in the work environment. "Safety is a fundamental part of everything we do as a company. From the workplace to the job site, it is the responsibility of every single employee," Phillip says. In addition, training and development remains a key focus for both companies to ensure that their employees are able to perform their duties effectively and safely, as well as helping them realise their individual potential.

Enquiries: Mile Sofijanic. Tel. 011 456 1205 or email mile.sofijanic@murrob.com



Sparkling project for local firm

Leading panelbuilder JB Switchgear Solutions was recently awarded two multimillion Rand contracts by Petra Diamonds for the design, manufacture and supply of motor control centres (MCC's) to their Cullinan and Finsch Mines respectively. The primary purpose of the C-Cut Phase 1 project is to extend the life of mines and to ramp up the rate of mining. The scope entails two areas. Firstly, the development of infrastructure to mine the new C-Cut Phase 1 block which consists of eleven million cubic metres of ore. Secondly, the deepening of the two existing shafts. The Rock Shaft will be deepened by 354 metres, and the Men Material Shaft by 80 metres. The winders and headgear will be upgraded to handle the increase in tonnages.

JB Switchgear scope include ten (10) 'Eagle' series motor control centres containing over two hundred DOL starters ranging between 10kW and 200kW. In addition, a number of variable speed drives (VSDs) between 18,5 kW and 160 kW were installed, as well as soft starters ranging between 160 kW and 200 kW. Incomers up to 2 500 A were provided, and the communication protocol used is Profinet.

At Finsch mine, the Run of Mine (ROM) production will be increased from approximately 2,9 Mt/a at present to 3,5 Mt/a while carat production will move up from 1,88 Million carats to around 2 Million carats.

JB Switchgear's scope in this instance include five (5) 'Eagle' series motor control centres which include over seventy DOL starters between 0,37 kW and 200 kW, as well as a variety of variable

speed drives (VSDs) and soft starters ranging between 30 kW and 220 kW. Incomers are rated at 1600A. Here also, the client chose Profinet as the communication protocol. JB Switchgear's 'Eagle' series of assemblies carry type test certification for compliance with IEC 61439/SANS 1973-1 and IEC 61641 standards. The design is well proven, robust and user friendly, with more than thirty thousand tiers installed globally. **JB Switchgear** is also ISO 9001 – certified for their quality management system.

Enquiries: Johan Basson Tel. 011 027 5804 or email info@jbswitchgear.co.za



Willie van Molendorff, Chris Benecke, Cobus Nel (Petra Diamonds) and Johan Basson (JB Switchgear).

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Suppliers need to evolve along with **sensor technology**

By G Bryant, Countapulse Controls

The speed and complexity associated with modern manufacturing and processing environments has meant that more and more processes are incorporating sophisticated instrumentation to ensure that they run at designed efficiencies. In addition, the replacement of original sensing, measuring and monitoring devices represents a perfect opportunity to assess a specific application and the suitability of the equipment.

This is where specialist total solutions providers come to the fore in being able to recommend a more fit-for-purpose solution.

This should take into account not only the latest trends and developments, but also the client's specific requirements. It is entirely possible that selection of the original units occurred with one particular machine in mind, rather than a holistic overview of the entire process.

When replacing older or outdated units, it is essential that the entire process be taken into account. In so doing, the supplier will be able to provide a far more cost-efficient and plant-related solution. This is becoming ever more critical as process plants and manufacturing operations are facing increasing pressure to cut costs and improve productivity.

Looking at the latest trends and developments, it is not only the machinery itself that is becoming more complex, but also the materials of construction. This poses unique challenges all by itself. For example, in the packaging industry, specialised sensors are required to carry out functions such as detecting objects on, or through, shrink-wrapped pallets.

The Leuze PRK 25B and Leuze PRK 46B ranges of opto-electronic sensors are an example of the fast-paced advancement in the arena of sensor technology. These sensors are particularly suited to such challenges as dealing with reflective surfaces.

The top-of-the-range Leuze PRK 46B sensor, designated as a 'power package', offers a high degree of functional reliability. It has a long sensing range of 18 m, as well as extremely high performance reserves. This long sensing range means that these devices are suited for applications such as monitoring gaps in high-bay warehouses.

However, it is not only technology that is changing, but business methodologies as well. In keeping with this dynamic environment, companies operating in this highly specialised and sophisticated sector need to continue evolving from being simply suppliers of sensing and monitoring devices to being a total solutions provider offering its clients complete technologically-advanced packages, in conjunction with high-level support and service. That should be underpinned by expert assistance in both the selection of application-appropriate and cost-effective solutions, in addition to the installation



The Leuze ODS 96B optimal laser distance sensor features CCD technology.



Selecting sensors for specific applications requires the necessary expertise of a dedicated supplier such as Countapulse Controls in order to ensure optimum functionality and technical applicability.

- In the dynamic and sophisticated sensors environment, technology and business methodologies are changing.
- Sensor selection is not as simple as matching a model number to a specific requirement.
- Each application has unique and specific needs.



of complete systems. The rapid rate of development of sensors in the manufacturing process make it essential that sensor companies stay abreast of the latest technology and in so doing are able to accurately assess individual applications and provide fit-for-purpose solutions.

For example, developments in shaft encoders have resulted in a new benchmark being set in terms of accuracy and performance. A typical example is the ACURO absolute shaft encoder, which offers a viable, future-oriented solution for industrial control engineering and integrated motor feedback applications.

Developments in shaft encoders have resulted in a new benchmark being set in terms of accuracy and performance.

The heart of the ACURO absolute shaft encoder is a sensor unit incorporating a brand new OptoASIC (Infrared Optical -Application Specific Integrated Circuits) design. It is engineered for long-term operational safety, and also incorporates highly integrated motor feedback systems.

This compact encoder is ideal for applications where there are space constraints, a growing trend in the manufacturing environment. Single- and multi-turn versions are accommodated in the same housing, allowing for increased flexibility. The encoder can operate

in temperatures from $-40\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$. When one takes a client's specific application into account, it is best to look beyond a single problem area. By considering the overall operation of the plant, one will be able to find a solution that will encompass any unforeseen needs with the process.

It is important to understand that sensor selection is not as simple as matching a model number to a specific requirement. The operating environment has to be assessed thoroughly in order to gain a high-



The Leuze MLD safety devices have six different muting operating modes.



Leuze electronic sensors are considered ideal for warehouse applications.



The use of safety laser scanners from Leuze ensures protection of workers in automated plants.

level understanding of all the elements that need to be monitored, and what the most appropriate products are.

It is not simply about 'adding-on' new products into the manufacturing process. When a machine goes down and an existing piece of instrumentation needs to be replaced, this is when we get the largest number of requests for assistance. An added complication for clients is having to source replacement sensors for older machines supplied by OEMs, and not having a proper understanding of how these sensors function.

Parameters that must be taken into account are the range of the sensor, the speed of the automatic process, the background conditions and type of product, auxiliary equipment and the circuits within the process. An example is selecting a photo electric sensor that is suitable for various switching distances within a plant. The customer then has the option of standardising on one sensor type, as opposed to having different devices throughout the process, which will reduce parts inventory and associated operating costs.

A failure to understand the full capabilities of a specific device could result in the selection of a far costlier sensor, when a more cost-effective option would suffice in a particular application. Technical acumen and experience play a large role in reducing the effects of human error, which could result from uninformed product choice and the absence of appropriate technical counsel.

This is where a dedicated technology and solutions provider like Countapulse Controls plays a vital role. Each application has unique, specific needs. In order to provide a balanced solutions driven approach, it is advisable to select a supplier with extensive industry knowledge and a diverse portfolio of customers.

Conclusion

Countapulse Controls is able to provide its local customers with the latest technology and innovations being introduced into major international markets such as Europe and the US. By maintaining excellent relationships with our principals, in addition to an intimate understanding of the local market, we are able to identify those products that are most suited to the southern African context. This is differentiates us from online suppliers that are merely selling boxes, as opposed to application specific solutions.



The Leuze Series 5 sensor is ideal on conveyor and storage systems as well as in special-purpose machinery manufacturing.

Gerry Bryant is the managing director of Countapulse Controls, southern African supplier of sensing, measurement, counting, switching, monitoring and positioning instrumentation. In operation for many years, the company has the full backing of its German principals and offers a complete technical advisory service for the most effective use of its products in automotive and other branches of engineering. Enquiries: Tel. 011 615 7556 or email Bryant@countapulse.co.za

Touch sensor – start, stop, acknowledge

ifm's KT capacitive touch sensors can be used, for example, as a start and stop function on machines or as an enable switch for opening and closing gates. Compared to mechanical switches the sensors operate without wear. Dynamic touch sensors can detect an approaching human hand and suppress interference such as water, layers of ice or foreign bodies to a large extent. Even a gloved hand will still trigger them. Static touch sensors detect hands and objects through glass for as long as the sensing face is covered which provides, for example, protection against vandalism.

With the latching operating principle it is possible to switch the sensor on by touching briefly and to switch it off again by touching briefly. The housing is resistant to oils and it is also impact and scratch resistant. Symbols on the sensing face can be selected separately. The sensor offers the protection rating IP 69K and a wide temperature range from -40 to 85 °C. LEDs for optical feedback signal that the sensor has been activated. The green LEDs can be controlled separately and, for example, be used to indicate the status of plant and machinery. Installation alignment of the sensor is not necessary

since the clip showing the symbol for the sensing face is snapped in as the last step. Wiring is done via the tried-and-tested 3- or 4-wire technology.

Enquiries: Tel. 012 450 0370 or email info.za@ifm.com



Launching ergonomic design thermal imagers

Comtest has introduced Fluke's new Expert Series thermal imagers – the TiX560 and TiX520 to the southern African market. Users of infrared devices need maximum flexibility with an ergonomic design that allows for easy navigation over, under and around hard-to-reach objects. With an articulating lens that rotates a full 180 ° with the FlexCam lens, and the largest 5,7 inch touchscreen LCD, Fluke's new TiX560 and TiX520 can aim and focus from a comfortable angle and easily capture the target that was once impossible to see.

They also feature the largest LCD touchscreen and leading spatial resolution for a 320 x 240 infrared camera in its class – meaning 150 % more viewing area, making it easier to annotate, edit and analyse images.

Getting in-focus images can be painstaking with manual focus systems, and some autofocus systems may not be exactly what is required for the task. Fluke Professional and Expert Series cameras include some of the most innovative focus technologies available, such as Fluke's LaserSharp Auto Focus. Image Sharpening allows for premium image output in high temp applications by combining

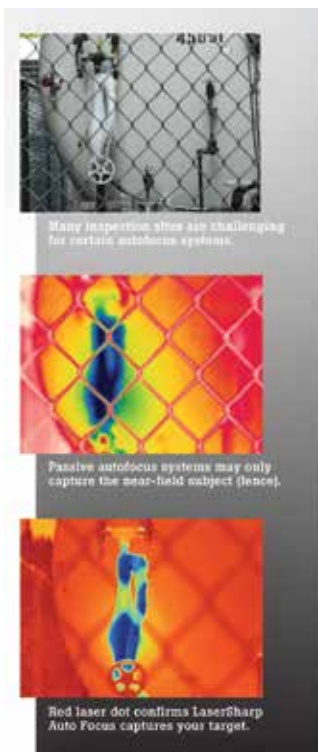
multiple sequential frames of data into one (TiX560 only). Fluke uses only 100 % diamond-turned germanium lenses covered with a specialty coating.

The best spatial resolution has the largest number of detector pixels within the smallest field of view. This combination is measured in mRads, and the smaller the number, the more detailed the image. Fluke thermal imagers' mRads range from 0,6 mRad (best) to 56 mRad, while competitive models range up to 10,3 mRad.

Enquiries: Tel. 010 595 1821



FLUKE IR TiX500 expert series.



Many inspection sites are challenging for certain autofocus systems.

Passive autofocus systems may only capture the near-field subject (fence).

Red laser dot confirms LaserSharp Auto Focus captures your target.

FLUKE IR TiX500 precise focused images.

Speed sensors for drives and axes



The high switching frequency of 15 000 Hz, as well as the extended temperature range of - 32 to 125 °C, make the new MX5 magnetic speed sensors from ifm the perfect partner for the detection of rotational speed and direction of rotation on axes, drives and shafts. The detection of both direction of rotation and rotational speed is integrated into one housing. With fully electronic magnetic measuring cells, the sensors function reliably without contact, even in the case of heavy soiling. They are 'magnetically biased' with an integrated permanent magnet. The ferromagnetic teeth on a toothed wheel alter the existing magnetic field so that a corresponding switching signal can be generated. The sophisticated housing concept offers different combinations of housing lengths and connections, such as straight or angled cable outlets and AMP connectors. Toothed wheel modules made of metal are standardised and have a defined tooth width and distance. The flanged housing offers quick mounting and accurate adjustment of the sensor with only one screw. This reduces phase shift and guarantees precise detection of the toothed wheel.

Enquiries: Tel. 012 450 0370 or email info.za@ifm.com

New line of sensors for use in hazardous areas

ATEX approved equipment and devices are commonly used in hazardous working conditions. They need to be extra strong and durable to withstand the elements that they will be exposed to. ifm has designed and developed its newest line in ATEX protection.

ifm's type IND inductive sensors are intrinsically safe and consist of two inductive sensors in a potted and robust housing with IP 67 protection rating. They are equipped with connection for solenoids. Two sensors are built-in: one sensor provides a signal when the valve is open, the other when it is closed.

The solenoid connection is optionally a standardised M20 x 1 connector or an M12 connection. The terminal chamber is easy to open and close. Since the terminal block can be removed, no new wiring is required if the sensor is replaced. The units are approved to ATEX categories 1D/1G and 2G.

The IND sensors provide easy access to the terminal chamber and feature a removable terminal block for easy wiring and a robust and resistant housing. They have a permanently legible lasered type label and fit directly on valve actuators.

Enquiries: Tel. 012 450 0370 or email info.za@ifm.com



New micro-controller condition monitoring system

Instrotech, distributor and manufacturer of a range of process control instrumentation and specialised systems, has announced the launch of UK-based Monitran's MTN/5000; a cost-effective and versatile microcontroller-based condition monitoring system, for application in vibration monitoring and logging of any sensor-

based design, for example temperature, pressure, voltage/current/power. The MTN/5000 is housed in an extruded aluminium enclosure and features a 9 cm TFT touch screen with a high performance ARM Cortex-M3 processor. It has an easy-to-navigate menu that enables users to set data sampling periods up to 1million/second, ranges and accuracy levels plus vibration threshold (alarm) levels on a channel-by-channel basis or across all 12 channels. In addition, the system has 12 digital I/O channels that can be used for multiple alarms or a communication channel for integration with other systems.

As an optional extra, the system can be fitted with Modbus TCP/IP, for networking purposes or to enable multiple MTN/5000s to operate together within a larger monitoring or control system.

The MTN/5000 system is made to order and, in addition to specifying how many input channels the MTN/5000 should have, the user can request front panel customisation, such as asset numbering. The system requires an input voltage of 24 Vdc and the enclosure dimensions, including glands are 372 x 250 x 200 mm.

Enquiries: Pieter Deysel. Tel: 010 595 1831 or email sales@instrotech.co.za



Multi-functional Vision Sensor

A new generation of vision and barcode sensors offering multiple tools and resolution options has been introduced by **RET**

Automation Controls. The iVu Plus Gen2 line, developed by Banner Engineering, includes integral and remote screen models for use in a wide range of inspection, machine vision and quality control applications. The vision sensors with built-in illumination are designed to solve applications that would typically require multiple photoelectric or proximity sensors. They now include a full resolution option to detect small features, as well as the capability to use multiple sensor tools in the same inspection. Bar code readers validate twelve 1D and 2D barcode formats to support advanced traceability in all

industries. They offer a coarse mode resolution setting that can provide significantly faster read rates, especially for 2D barcodes. The sensors can store and control up to 30 inspections for fast product changeover. The rugged IP67 rated housing allows use in hostile environments. Remote displays are available in both machine mountable and hand-held configurations. An intuitive touch-screen user interface allows the user to configure, monitor and modify inspections without an external PC. EtherNet/IP and Modbus/TCP connectivity simplifies communications with many PLCs and HMIs.

Enquiries: Tel. 011 453 2468. Visit www.retautomation.com



Countapulse Controls offers top of the range sensors for modern processes and instrumentation



The speed and complexity associated with modern manufacturing and processing environments has meant that more and more processes are incorporating sophisticated instrumentation to ensure that manufacturing processes run at designed efficiencies. It is with the selection and replacement of such equipment that the experience and expertise of Countapulse Controls comes to the fore, Gerry Bryant, Managing Director, says. Countapulse Controls is the leading southern African supplier of sensing, measurement, counting, switching, monitoring and positioning instrumentation.

"It is not only the machinery that is more complex, but also the materials of construction of products being made that have created challenges of their own," Bryant notes. For example, in the packaging industry, specialised sensors are required to perform functions such as detecting objects on or through shrink-wrapped pallets.

Both the Leuze PRK 25B and Leuze PRK 46B ranges of opto-electronic sensors from Countapulse Controls are suited to challenging operations like those with reflective surfaces. The top of the range Leuze PRK 46B sensor, designated as a 'power package', offers a particularly high degree of functional reliability. It has a long sensing range of 18 m as well as extremely high performance reserves. This long-sensing range makes these devices particularly suitable for applications such as monitoring gaps in high-bay warehouses.

Bryant says the rate at which development in sensors in the manufacturing process has taken place has also contributed to making it difficult for non-specialists in this field to keep up with technology. Developments in shaft encoders over the last few years have seen a new standard being set in terms of accuracy and performance. A typical example is the ACURO absolute shaft encoder, which offers a

viable, future-oriented solution for industrial control engineering and integrated motor feedback applications.

The heart of the ACURO is a sensor unit incorporating a new Op-toASIC design. It is designed for long term operational safety, and incorporates highly integrated motor feedback systems. Compact in design, this encoder can be used in applications where there are space restrictions. Single and multi turn versions are accommodated in the same housing, allowing greater flexibility, and the encoder can operate in temperatures from minus 40 °C to plus 100 °C.

Bryant adds that it is not always about incorporating new products into the manufacturing process. "When a machine goes down and an existing piece of instrumentation has to be replaced, this is when we get the most requests for assistance," he says. It is often difficult for customers to source the requisite replacement sensor as generally this would have been supplied with the machine from the OEM and the maintenance personnel may not even be aware of the actual function or requirement of the sensor itself.

"This is where Countapulse Controls plays an important role in being able to identify the function of the sensor and assist in selection of an appropriate replacement. Sensors have always played an important role in automation and control, and this will continue unabated as technological development continues apace. Specialisation in the field of sensors by Countapulse Controls as well as our development of close relations with recognised international partners places us in the ideal position to provide appropriate solutions for industry," Bryant concludes.

Enquiries: Gerry Bryant, Countapulse Controls (Pty) Ltd. Tel. 011 615 7556 or email bryant@countapulse.co.za. Visit www.countapulse.co.za



Left: The Leuze 18B series is an example of the extensive range of sensor technology available from Countapulse Controls.



Right: Technology and flexibility are the key characteristics of the Hengstler ACURO series range of incremental and absolute rotary encoders distributed locally by Countapulse Controls.



Voltage sag solution

By S Kuwar-Kanaye, Impact Energy

The ultimate real-time reactive power compensation system for low voltage sags.

Sags are short-term reductions in the rms magnitude of the supply voltage lasting from a fraction of a second up to several seconds. Sags are described in terms of duration and retained voltage i.e. the percentage of the nominal supply voltage (rms) remaining during the event. Many dips are caused by faults on the supply network with the severity of the dip depending on the relative positions of the generator, fault and measurement point. According to IEEE 1159 [1] voltage dip 0,5 to 30 cycles typical magnitude 0,1 -0,9 pu. Voltage sags are becoming an increasing concern for process industries owing to an increase in the automation of systems. Automated facilities are more difficult to restart and the electronic controllers used are sometimes more sensitive to voltage sags than other loads. As a result, many voltage disturbances lead to disruption and financial deficits.

The enormous cost implications may seem trivial for events lasting less than a second. In particular for the continuous process industry, such as plastic extrusion or papermaking facilities, the effect of a dip is just as serious as a complete blackout that carries the same clean-up costs, raw material losses and loss of production.

Harmful effects for the plastic extrusion industry

Extrusion is a continuous process for the production of semi-manufactured products such as pipes, profiles, cable sheaths, films, sheets and plates. Plastic extruders are usually associated with having a wide range of controls, and these controls usually include ac or dc drives, PLCs as well as other numerous control relays, solenoid valves, etc.

In order to protect the power electronics in the drive, the under voltage protection is set at a very sensitive level. It will block the entire process whenever it registers a voltage drop of 15 % - 20 % or more in one or more of the phases. Immediately following a sag, which halts the entire process, the workforce will begin to restart the process lines in succession. Depending on

PLC – Programmable Logic Controller
 rms – root mean square
 UPS – Uninterruptible Power Supply

Abbreviations/Acronyms

the number of production lines, the entire process outage can range between one to four hours. In many cases the extruder itself will be restarted immediately after the sag, however if the extruder is not restarted immediately and the molten material is allowed to remain in the extruder, it can burn when reheated and as a result, the burned particles will emerge from the extruder gradually, over a period of several days, resulting in a poor quality product.

This ride-through capability easily resolves almost all the voltage disruptions in developed countries.

As such, the cost of such a burn would be much higher as opposed to just discarding the excess polypropylene after extrusion. Furthermore, the workforce cleans the equipment and therefore there is neither an increase nor a decrease in labour costs. Another major influencing factor concerning the financial loss is whether or not the factory production runs continuously. In continuous production, the production lost during downtime cannot be recovered by working extra time, so loss of production translates directly into loss of profit – that is, the loss is equal to the value of the product not produced as a result of the downtime. The cost associated with line trips owing to an outage can run into tens and hundreds of thousands of Rands per outage. Cost incurred may be owing to:

- Downtime
- Scrap product
- Cleaning of the system before being able to restart

Plant restarts as a result of dips increases maintenance and operational costs and drastically decreases equipment life span.

Solutions available on the market

Uninterrupted online power supplies

This solution offers continuous load power that is generated from a storage battery. The battery is constantly charged from the power supply, and provides immunity to dips. Installing an Uninterruptible Power Supply (UPS) will minimise the interruption process. The downside to this approach lies in the battery itself. The disadvantages in using lead acid batteries are:

- They generate hydrogen gas and must, therefore, be ventilated
- Battery lead is a hazardous waste product
- The battery life is limited and decreases rapidly when cycled often

It should also be mentioned that UPSs generated amounts of current harmonics onto the system and end-users should install additional harmonics filter in order to minimise the level of harmonics. For example, a high capacity UPS will require additional accessories in

order to meet the needs and requirements of the utility. Not to forget the fact that apart from all these considerations – the price is high for large loads.

Providing voltage stability

The Equalizer Turbo has been specifically designed to meet the needs for a wide range of manufacturers – as well as for the plastic extrusion or papermaking industries. It provides a ride-through three phase 0,4 pu, voltage dip ΔU 60 % with a typical duration set for three seconds. Clients may specify an even longer duration to meet their individual requirements for production. This ride-through capability easily resolves almost all the voltage disruptions in developed countries.

Additional advantages include:

- Restoring the voltage to 1,0 pu of its nominal value (+-15 %)
- Correcting each phase accurately and independently owing to independent phase compensation, the Equalizer Turbo can
- Having an integrated software monitoring system with event notification and remote access

Conclusion

The Turbo will not generate or inject any current harmonics into the system owing to its electronic switching technology at current zero crossing. In addition, it will not cause any harmonic-related problems (i.e. no additional requirement of costly filters). In contrast, the UPS generates a high amount of current harmonics to the system, requiring harmonic filters. High capacity UPSs require additional accessories to match utility requirements.

Reference

- [1] IEEE 1159. 2009. Recommended practice for monitoring power quality.

- Sags are short-term reductions in the rms magnitude of the supply voltage lasting from a fraction of a second up to several seconds.
- Many dips are caused by faults on the supply network.
- The Equalizer Turbo has been designed to provides a ride-through three phase voltage dip with a typical duration set for three seconds.

take note

Sishal Kuwar-Kanaye has spent several years in HV project, commissioning and maintenance environments. He holds a BTech Elec degree, a Masters Certificate in Project Management (GWCPM), Certified Energy Manager (CEM), Certified Measurements and Verification Professional (CMVP) and he is registered with ECSA. He is Group Project Engineer at Impact Energy. Enquiries: Email sishal@impactenergy.co.za

World's first high-voltage equipment designed to use g3 - SF6-free gas

At the 2015 Hanover Fair, **Alstom** presented two first high-voltage applications using g3 (green gas for grid), a gas mixture that can replace SF6 for high voltage air-insulated (AIS) or gas-insulated switchgear (GIS) applications. SF6 is a potent greenhouse gas commonly used as an electrical insulator. In August 2014, Alstom became the first company in the world to offer the electrical industry a technically and economically viable alternative to SF6. The first application is a pilot project for a 420 kV g3-insulated busbar (a gas-insulated busbar is essentially a concentric system of cylindrical enclosures and conductors, insulated with a pressurised gas). Alstom has been awarded a contract by the United Kingdom's National Grid Electricity Transmission PLC



to trial, as part of an innovation project, a 420 kV g3-insulated busbar for use at temperatures as low as -25 °C. The 300 meter-long line will be located in Sellindge, in the South East of United Kingdom and will be commissioned by mid of 2016. National Grid is strongly committed to managing its environmental impact, actively supporting initiatives to reduce SF6. By choosing this promising technology as part of its planned network re-enforcement, National Grid demonstrates its investment and efforts towards greener solutions for the grid. The second application is a 245 kV current transformer type SKF using g3. This high voltage equipment for outdoor applications, displayed at Hanover Fair, uses g3 as insulation medium, with the capability of reaching temperatures as low as -30°C. The current transformer protects substations by providing accurate and reliable current measurements used for metering. These first applications are precursors to future developments towards larger ranges of g3 insulated high voltage products.

Enquiries: Aline Besselièvre. Email aline.besselièvre@alstom.com

Latest generator set technology available in Africa

Industrial operations across Africa can lower their fuel costs and minimise their impact on the environment with the new range of high-horsepower QSK95 Series generator sets launched locally by the African division of Cummins – a global leader in the manufacture, sales and servicing of diesel engines and related technology. The QSK95 generator sets are **Cummins** Power Generation's most powerful diesel generator sets to date, offering up to 3,5 MW 60 Hz and 3,75 MVA 50 Hz. They are engineered with the highest kilowatt per square foot ratio in their class, resulting in a smaller footprint that achieves a 20 % improvement in power density. The durable and robust

QSK95 Series generator sets are ideally suited for mining, oil and gas, or any project where harsh conditions, challenging environments and the demand for reliable, continuous remote power exist. The QSK95 Series generator sets are also engineered to deliver reliable, mission critical power protection without interruption – an uptime requirement shared by data centres, hospitals, water and wastewater treatment plants, and utilities. Cummins Southern Africa Power Generation Director Kobus Coetzer points out that the new generator sets boast more power and best-in-class fuel economy. "Over the course of 8 000 hours of operation, the QSK95 can achieve

fuel savings of more than US\$ 400 000 (R4 M+). The QSK95 Series is designed to lower the total cost of ownership by reducing installation expenses, fuel costs and maintenance requirements – all while maintaining Cummins' high standards of reliability."

Enquiries: Kobus Coetzer. Tel. 011 321 8700 or email kobus.coetzer@cummins.com



Standing by – new diesel-driven generator ranges

Renttech South Africa launched two new ranges of diesel-driven generators, and has plans for introducing gas-driven generators early in 2015. The new ranges of diesel-driven generators include a heavy-duty range covering 10 to 30 kVA in both single and three phase sound-attenuated models, and an extra heavy-duty 'rental spec' series for extreme conditions. "The smaller units are popular for domestic and small business use, whereas our standard units are popular with larger businesses and site use. The 'Rental spec' units are aimed

at heavy-duty on-site applications," explains Martiens Opperman, Renttech South Africa's operations manager. Opperman emphasises that the company is constantly striv-

ing to improve the quality and efficiency of its products, many of which are sourced internationally, with the overall aim of supplying top-quality, versatile products at affordable prices. "The 10 – 30 kVA range is small and compact, 1 500 rpm, sound-attenuated and fitted with a Kubota/Newage Stamford power pack and offered at extremely competitive prices. The heavy-duty 'Rental spec' units can be double-stacked, painted to marine container specifications and come with a standard five year rust proof warranty. These can be supplied as dual frequency units (50/60 Hz). These units are fitted with either Perkins/Newage Stamford or Cummins/Newage Stamford power packs and handle ambient temperatures of up to 50 °C. The units 800 kVA and above are fitted in converted soundproof marine containers which are ideal for site use," says Opperman. The two new generator ranges form part of Renttech's existing range of power generation equipment which is used across a number of industries in South Africa and Africa, including the mining, construction, ship-building and petrochemical industries..

Enquiries: Tel. 010 003 7400. Visit www.renttechsa.co.za



First 500 kV sub-station in Colombia

Alstom Grid has been awarded a € 23 M contract to supply the first 500 kV sub-station for Empresa de Energía de Bogotá (EEB). The substation will be located at Gachanzipa, 30 km north from Bogota, capital city of Colombia. It will connect the Hydro Sogamoso power plant to Bogota, improving and increasing the reliability of the city's energy system. The project is due to be completed by mid-2017.

The substation is essential to support the national program of energy improvement in Colombia, which focuses on projects that will reduce power loss, meet the environmental standards of the country and also guarantee that the substation operates at optimum efficiency.

Alstom will deliver the 500 kV turnkey substation, inclusive of design, civil works construction, erection and commissioning. Part of the solution offered is Alstom's air-insulated switchgear comprising live tank circuit breakers, disconnectors and instrument transformers. The equipment has a proven track record of its performance under high altitude, heavy pollution and seismic zone restrictions.

Alstom and EEB have been working together over the last 15 years, developing several turnkey substations in Colombia. "This is one of the major projects that Alstom Grid Colombia is participating in. It is extremely gratifying to be part of EEB contract, especially as it represents an important milestone to the region. Securing this contract demonstrates the customer's continued confidence in Alstom", says Juan Jorge Celis, Country President of Alstom Colombia.

Present in Colombia for over 60 years, Alstom has strong capabilities in engineering, manufacturing, project management and supply of products and solutions for infrastructure. Alstom Colombia is responsible for projects of turnkey substations and equipment to important power plants in the country, such as El Quimbo and Ituango.

Enquiries: Aline Besselièvre. Email aline.besselièvre@alstom.com



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For more info contact us on (011) 706 7184 or e-mail: info@powertech.co.za

www.powertech.co.za



Added capacity when demand is high

Business has been growing steadily since Barloworld Power, Caterpillar's southern African dealer, opened its power rental operation in Cape Town in October 2014 – and it's not all about load shedding.

Barloworld Power Rental is well established in Gauteng, KwaZulu-Natal and Angola. The decision to extend to Cape Town was based on demand from customers wanting reliable, backed up power solutions not only due to load shedding but also to provide additional capacity in high demand periods in agriculture and tourism in particular. The business rents and supports a wide range of Cat generator sets as well as industrial lighting solutions from AllightSykes. All generators are housed in sound attenuated, weather proof canopies with the smaller sets mounted on trailers for mobility. Generator sets can be synchronised to provide a range of solutions. Focal points of the new Cape Town power rental business in Bellville are naval and marine rentals, the growing oil and gas sector, the film industry, tourism and entertainment, as well as agriculture, says Brendon Hart, rental and used consultant in the fledgling Cape Town business. Hart is responsible for the Eastern Western and Northern Cape as well as Namibia. "We currently have more than 8,5 MVA of rental power in operation the western cape alone, 4 MVA in Namibia and 2 MVA in Eastern Cape." He adds that while load shedding is causing more businesses to consider back-up power, the secret of the success enjoyed by the power rental business in Cape Town has a lot to do with the reliability of Cat power systems and the support provided by Barloworld Power. "The agricultural sector has been proactive in seeking standby power solutions for periods of high workload such as harvesting in the grape industry.

Enquiries: Shivani Naidoo. Email snaidoo@barloworldpower.com



For UPS back-up

"Trojan's Reliant AGM is specifically engineered for deep-cycling applications, unlike most AGM batteries on the market today which are designed for dual-purpose or standby applications, such as UPS back-up," said Dave Godber, Trojan Battery's executive vice president of sales and marketing. "Trojan has focused on deep-cycle technology longer than any other battery manufacturer in the industry and has utilised our extensive expertise and knowledge in developing the industry's most reliable deep-cycle AGM battery." "Trojan's Reliant line of true deep-cycle AGM batteries feature elements that offer a new direction in AGM technology," said Gordon Beckley, senior vice president of engineering and quality assurance at Trojan Battery. "As the only true deep-cycle AGM battery on the market today, Reliant AGM is a completely new AGM design, which our engineering team has been developing for the last several years."

Enquiries: Kari Garcia. Email kgarcia@trojanbattery.com

Generator repair keeps the lights on in Darwin

The power station in Darwin started life as a 200 MW gas fired installation with three gas turbine generators that started full production in 1987. The 42 kVA generator, operating at 11,5 kV, was originally built in 1986, but after more than 25 years in service, the time had come for an overhaul.

Generators can be installed with a variety of coil designs, including 'frog-leg' coils and diamond coils but larger machines more commonly have bar wound stators, mainly because of the sheer size of a finished coil makes handling difficult. Once the bars have been installed the coils are formed by connecting the relevant bar ends together, brazing and then taping.

For **Sulzer**, the production process for the new bars starts with the raw copper, which is processed using its own in-house facilities to draw and anneal the base copper. The copper strip is manufactured to exacting tolerances before being coated with the first layer of insulation and cut to length.

Meanwhile, in Darwin, the generator was being dismantled and showing signs of its age with some considerable oil contamination of the stator windings being discovered. Having recorded all of the necessary

measurements, the old coils were removed and the stator thoroughly cleaned before the core was flux tested.

The flux test is used to measure the condition of the stator core insulation and thus detect any local insulation damage, which can cause the formation of larger eddy currents and local hot spots. Once complete and with a clean bill of health, the stator could be repainted and the rebuild process got under way.

This generator design consists of 54 bottom bars and 54 top bars, all of which have to be manufactured to tight tolerances in order to ensure they fit exactly into the stator slot.

Each bar has to be formed and shaped by hand, using the CAD-designed, wooden formers that allow every bar to be produced with exactly the right shape and dimensions. The final shape is then checked again in the wooden dummy stator that was constructed earlier.

Every bar is tested in the dedicated test cell with the results recorded and kept in the engineering archives. Testing includes tan, which relates to the power factor of the bars as well as strand-to-strand short circuit test-

ing and the outer corona protection (OCP) surface resistance measurement.

At this point the logistics team at Birmingham take over, having already constructed the shipping crates for the bars. Carefully packaging the bars to ensure they arrive undamaged is crucial to ensuring a trouble-free installation in Darwin. The shipment is timed to coincide with the disassembly of the stator on site, so as to avoid any unnecessary delays.

Once all 108 bars have been installed and secured to the end winding brackets, with wedges in place, each bar is subjected to a final high voltage test to be certain that none of the insulation has been damaged during the installation process.

Enquiries: Visit coilshop@sulzer.com



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Lowering operational costs through optimised energy consumption

By N Maleka, SEW-EURODRIVE

Energy-efficient drive systems are becoming more important than ever in South Africa – given the volatile power supply from the national grid as a result of continued load shedding, as well as surging electricity costs and increasingly-stringent environmental legislation.

The need to move to energy-efficient solutions is two-fold, namely: to minimise operating costs while maintaining existing infrastructure and capacity; and to lower plant power requirements and improve stability.

Energy costs can constitute up to 90 % of the lifecycle costs of systems that have not been optimised. Modular concepts are highly effective in proactively addressing this issue, as just one single efficiency-optimised drive component can positively impact a system's overall energy balance. A modular energy-saving system only includes components with optimised energy-efficiency.

Effective energy consulting services allow operations to witness real savings in their actual plant environment.

Combining these optimised components from the modular energy-saving system can result in 70 % energy savings. The most energy-efficient solution is, however, not only dependent on the components used, but also on the supporting analysis and consulting services. As a result, it is important that energy-efficiency specialists perform regular and thorough tests on an application.

Energy consulting is the primary service in the energy-saving concept. Customer-specific consulting allows solutions providers to identify the optimal energy-saving solution for individual systems, whether they exist or are still being developed. Focus should be placed

on the complete system. With the existing process sequences in mind, the goal is to reduce power loss, optimise power requirements and recycle released energy. Effective energy consulting services allow operations to witness real savings in their actual plant environment, rather than just the theoretical savings. All energy-saving factors should therefore be identified and implemented consistently. During highly-volatile power supply periods that are currently being experienced in South Africa, the benefit to the end-user is measurable success, with regards to a reduction in energy consumption and costs, while simultaneously lowering CO₂ emissions too.

SEW-EURODRIVE's newly-launched effiDRIVE energy-saving solutions are based on the company's proven modular concept. The solution is ideally-suited for numerous industries, including food and beverage, airport logistics, building ventilation systems, and intralogistics, such as storage and retrieval systems. The solution can be retrofitted onto existing machines and systems too.

Conclusion

The introduction of energy consulting to the SEW-EURODRIVE South Africa business unit is a natural extension of the mechatronic product portfolio and is aimed at assisting current and future clients with energy-efficient solutions. The company draws upon an extensive wealth of experience with tried-and-tested package solutions. Our energy specialists are familiar with the applications of numerous industries, thereby ensuring the success of all energy-efficient drive components.

- Energy costs can constitute up to 90 % of the lifecycle costs of systems that have not been optimised.
- The modular system described is suited to numerous industries and can be retrofitted onto existing machines and systems.
- Effective energy consulting services allow operations to witness real savings in the plant environment.



Norman Maleka has been with SEW-EURODRIVE for more than 10 years. He is a Mechatronics Engineer.
Enquiries: Email nmaleka@sew.co.za

Anti-poaching commitment makes a difference

Imperial Green Mobility has pledged their commitment towards helping save the African rhino by donating several electric all-terrain safari vehicles to an anti-poaching programme in the Eastern Cape. The vehicles will not only provide a completely off-grid solution for a 'green' game reserve experience, but also be utilised by conservationists to track injured rhino and deter poachers.

"Through our long-term relationship with **Nelson Mandela Metropolitan University** and their Uyilo (Electric Vehicle research and development department), we collaboratively identified the need for small, silent, robust, electric reaction vehicles for one of their partners, Shamwari Game Reserve. With our experience in electric vehicles we were able to develop a solution for Shamwari's huge Rhino poaching challenges," says Jonathan Cohen, Managing Director of Imperial Green Mobility.

Cohen explains that Shamwari - a leading conservation group - is home to a considerable number of both black and white rhino living across 25 000 hectares of land.

Despite a highly organised and dedicated anti-poaching unit, the Reserve has fallen victim to poachers twice before. The most recent attack involved a mother and her two-year-old calf. Both rhinos were butchered for their horns, with poachers even hacking off the tiny horns of the youngster.

"One of the biggest challenges facing anti-poaching teams is increasing the ground cover of units of foot patrol in an effort to not only locate poachers, but track injured or deceased rhino. This is where Imperial Green Mobility's all-terrain vehicles assist tremendously in the war against poaching. They are highly effective in that they are silent and able to navigate the toughest terrain, in the shortest time. They can easily be camouflaged and thereafter anti-poaching scouts can proceed on foot into thicker bush."

Enquiries: Tanya Storbeck. Email <mailto:tanya@imperialgreen.co.za>



How critical are power solutions in a water and wastewater plant?

Inside water and wastewater treatment plants, mechanical pumps and automated machine parts are at the highest risk of becoming damaged during power loss. Critical data can simply become corrupted or disappear. Whether customised or turnkey options are required, **Schneider Electric** critical power experts can build single phase and three phase UPS solutions to enable water and wastewater plant operators to:

- Make water safe for human consumption
- Comply with governmental regulations
- Meet high customer standards
- Improve operational performance

More than 50 % of US-based water treatment plants use UV technology to disinfect drinking water. They are required to meet specific Environmental Protection Agency (EPA) regulations, such as the UV

Disinfection Guideline which includes data on proper UV light dose measurement. While the Non Spec Allowance rule enables plants to halt water treatment operations in case of power outages, the reality is that water is too important a resource to cease treatment, even for the brief time required the backup generators to sync due to the additional time required to bring the UV lamps up to full intensity and functionality.

Typical electrical installations at water plants face downtime risks due to voltage sags. Schneider Electric provides wide-ranging solutions to heighten power quality and optimise productivity at water plants, as well as:

- Mitigate risks: Power problems like voltage sags, power outages, transients, and harmonics are all guilty of bringing electrical and automation systems down. The right power architecture includes integrated UPS to minimise these risks from occurring
 - Ensure continuous service operability: Proactive maintenance is a key in water plant electrical installations. For example, changing lamps in a timely fashion is recommended when their output has degraded
 - Boost system productivity: Integrated power architecture solutions offer the highest levels of productivity in the industry to streamline processes and help plants to improve revenue and profitability
 - Maximise operational safety: Safety is a top operational priority and plays a key role in improving the lifetime of installations, while keeping people safe

Enquiries:

Email enquiries@schneider-electric.com



Hytec Group Zimbabwe distributor appointed

Hytec Services Africa (HSA) has officially appointed Zimbabwe-based Hilmax Private Limited as a distributor in that country, effective 4 February 2015. With effect from the date of appointment, the family-owned Hilmax, which has hydraulic hoses and fittings as its core business, distributes the entire range of the Hytec Group products.

Petrus Viljoen, sales supervisor, HSA, who facilitated visits between the two companies' senior directors, will attend to the Hilmax business on a monthly basis.

"Hilmax's core business, the fact that they have strategically placed operations to service the mining industry, as well as its primary focus on servicing this industry's hose and fitting requirements, are only a few of the reasons Hytec believes them well-suited to represent the Hytec Group in Zimbabwe," says Viljoen. "Hilmax's client base comprises customers that HSA would naturally target, and this will aid in facilitating the rollout of the Hytec Group products to the Zimbabwean-related industries."

Enquiries: Petrus Viljoen. Tel. 011 573 5460 or email petrus.viljoen@hytec.co.za



At the official appointment of the Hytec Group's Zimbabwean distributor, Hilmax, are, clockwise from top left: Patrick Musavaya, Hilmax Operations Director; Gary Shaw, Africa Development Manager, Hytec Services Africa; Petrus Viljoen, Sales Supervisor, Hytec Services Africa; and Pascal Musavaya, Hilmax, chief executive officer.

Safety accolade – SIL3 capable

Mitech complies with the relevant safety management requirements of IEC61508 SIL3 and is Safety Integrity Level 3 (SIL3) capable. The Safety integrity level is defined as a relative level of risk reduction provided by a safety function, or to specify a target level of risk reduction. It can simply be defined as the measurement of performance required for a safety instrumented function (SIF). A functional safety assessment according to the European Standard, IEC 61508, was carried out on certain Mitech Control Valve (Pty) Ltd valve and actuator equipment. The equipment included the following: Globe control valves; Pneumatic linear actuators; Pneumatic rotary actuators. The assessment and certification was administered by exida, which is one of the world's leading accredited certification bodies and knowledge companies specialising in automation system safety. From the assessment it was determined that the audited development process, as tailored and implemented by Mitech for the valve and actuator equipment development project, complied with the relevant safety management requirements of IEC 61508 SIL3. SIL3 capable is the highest level of capability achievable and Mitech is extremely proud to have received this accolade.

Enquiries: Pieter Badenhorst. Tel. 011 927 4850 or email enquiries@mitech.co.za



Funding for learning material – Diepsloot Pre-school Project

The **Zest WEG Group** has provided funding to the Diepsloot Preschool Project to allow it to purchase foundational learning material for the initiative as part of its Corporate Social Investment (CSI) programme. "The Zest WEG Group identified this important community initiative as being synergistic with its own goals of encouraging and fostering educational development," Nokuthula Shabangu, CSI project manager for the Zest WEG Group, says. "In terms of our CSI focus, this clearly indicates the commitment of all the Group companies to community empowerment and development," Louis Meiring, chief executive officer, Zest WEG Group, says. Thanks to major funders such as the Zest WEG Group, the Diepsloot Preschool Project, started 20 years ago by Patti Hanley, Marion Tapson and Jane



Mathies from Lonehill Village Church as an outreach programme, today has blossomed into a significant umbrella project overseeing 22 preschools in total and facilitating 1 600 children a year.

Enquiries: Kirsten Larkan. Tel. 011 723 6000 or email kirstenl@zest.co.za

Dharmeta Makan, Zest WEG Group human resources specialist; Patti Hanley, Diepsloot Preschools project founder and developer, Nondumiso Nbhele, Zest WEG Group human resources assistant and Busisiwe Ngwenya, Kideo Kids Nursery School teacher.

Horizontal monoblock pump for water circulation



LEO's XKP series are self-priming centrifugal pumps (with filter) mainly used in water circulation and filtration systems such as water treatment systems, light industries and small and medium swimming pools. The pumps provide stable, reliable and cost-effective pump operation with a low noise action. With a horizontal monoblock design, the pumps offer a 27 m³/h maximum flow, a 17 m maximum head and are suitable for use in temperatures of up to 35 °C. XKP pumps have a plastic pump body, an AISI 304 stainless steel shaft and meet IPX5 protection as well as insulation Class B requirements. They are available in DN 40 – 63 mm motor sizes. LEO is represented locally by **Raptech**.

Enquiries: Tel. 011 693 5110 or email enquiries@raptech.co.za

Large power plant automation order

ABB has won an order worth over \$ 160 M from Eskom to supply control systems, software and instrumentation for the 4 800 MW Kusile coal-fired power station under construction near Witbank. Kusile will be the fourth largest coal-fired power station in the world and will help boost South Africa's capacity. It is among a new generation of high-pressure, high-temperature power installations, also known as supercritical, whose efficiency surpasses that of conventional coal-fired power plants, producing lower emissions and reducing fuel costs. Kusile will be the first in Africa to use wet flue gas desulphurisation technology in all its plant boilers. Eskom, which generates more than 90 % of its electricity from coal-fired power stations, is installing state-of-the-art clean coal technology in one of its largest plants to help ensure a long term, reliable source of baseload electricity for the region. ABB is supplying a complete control and instrumentation solution for the entire plant, including boiler protection and plant simulator, engineering, installation, commissioning, optimisation and training.



Enquiries: Email
Natasha.Mpela@za.abb.com

Royal touch to engineering facilities expansion

Sulzer's new, purpose-built Service Centre in Middlesbrough has been officially opened by Her Royal Highness The Princess Royal, who was given a tour of the new facility by Arthur Grant, the service centre manager. The new £ 4,5 M Service Centre is part of the national engineering and repair facilities that enable Sulzer to offer a true 24/7 service for engineering solutions including the repair of large rotating machines across the UK.

The event was well attended by senior Sulzer staff, customers and local dignitaries who have welcomed the latest investment in the city which forms part of the huge redevelopment of Middlehaven, the historic industrial heart of Middlesbrough. Sulzer relocating to the new premises has also made way for the regeneration scheme, which covers an area of approximately 57 hectares (140 acres).

Sulzer has demonstrated its commitment to the North East by expanding the size of the available facilities by over 25 %, which has enabled the company to create a new metal spraying facility and a comprehensive load testing area for both low voltage and high voltage motors and generators.

Enquiries: Email claudia.proeger@sulzer.com



Sulzer's new, purpose-built Service Centre in Middlesbrough has been officially opened by Her Royal Highness The Princess Royal.

Bizz Buzz

Current Automation expands

Current Automation has opened a new branch in Mbombela (Nelspruit). The new premises are: Units 6 and 7, Crystal Tide Street, Riverside Park.
Enquiries: Tel. 013 004 0012.

New in South African renewables market

NRG Energy, provider of diverse conventional, distributed and renewable energy solutions in the United States, through its subsidiary NRG Renew, has entered the South African market - led by South African local Grant Pattison, a former chief executive officer of Walmart-owned Massmart Holdings. NRG Energy is a Fortune 250 company and the largest independent power producer (IPP) in the U.S., with an installed base of more than 52 gigawatts (GW) of power, with 4.2 GW from renewable sources, and annual revenues of \$ 11 billion. The long-term aim of NRG and NRG Renew is to work with business customers - both international and local - to deliver world-class distributed and micro-grid power solutions for their businesses.

Enquiries: Email Jeff.Holland@nrg.com

More business in Saudi Arabia for Yokogawa

Yokogawa Electric Corporation has stated that its subsidiary, Yokogawa Saudi Arabia, has received orders to deliver distributed control systems (DCS) for the PP13 and PP14 combined cycle power plants that the Saudi Electricity Company (SEC) is building in Riyadh, Saudi Arabia's capital city. The PP13 and PP14 plants will each have a combined net electric output of 1 980 MW. Power blocks 1 and 2 of the PP13 plant are scheduled to begin operating in May and October of 2016, respectively, while the two power blocks at PP14 are scheduled to start in November 2016 and April 2017.

Enquiries: Email
Christie.cronje@za.yokogawa.com

New technology improves efficiency on tried-and-trusted equipment

Cape Brick remains the longest-running manufacturer of the most energy-efficient and environmentally-friendly quality concrete masonry products in the Western Cape, through its commitment to customer service excellence and product innovation.

A major contributing factor to this ongoing success is maintaining long-standing relationships with equally reputable partners such as **Pan Mixers South Africa (PMSA)** – the largest supplier of concrete brick, block and paving making machinery in Africa, which has remained an equipment supplier-of-choice to Cape Brick's Philippi manufacturing plant for more than 15 years.

Cape Brick's Anthony Gracie reveals that the company recently added a supervisory control and data acquisition (SCADA) system, which serves the mixing and block plants on an integrated platform.

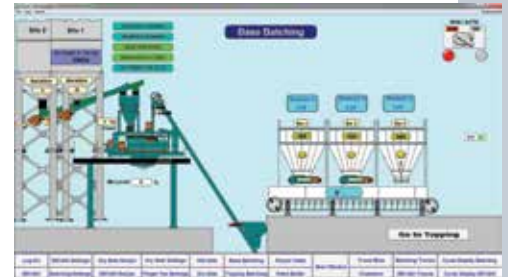
"The SCADA system displays visual, animated graphics of machine operation, machine parameter control and data capture.

It has proven to be a tool that we cannot run without, as its advanced and interactive efficiency increases daily manufacture by between 10 and 20 %."

Another innovative PMSA concrete solution supplied recently to Cape Brick is the FL Ludwig wall scraper mounted probe.

According to Gracie, the tool ensures a highly-consistent water dosing in the mixture, which ultimately results in more predictable concrete.

Enquiries: Quintin Booysen. Tel. 011 578 8700 or email quintin@panmixers.co.za



Compact video pyrometer for hot metalwork

Optris, specialists in non-contact temperature measurement, have announced a world exclusive - their pyrometer optris CTVideo 3M, the new benchmark in the area of industrial pyrometers regarding the size and durability of the miniaturized sensing heads. These heads are especially developed for the use in small and cramped surroundings and are perfect for applications with limited space. The very advantageous cost-performance-ratio supports the integration of the pyrometers within OEM solutions and



simultaneous use of the measurement devices at multiple infrared measuring facilities. The pyrometer optris CTVideo 3M, designed for a temperature range from 50 °C to 1 800 °C, has a special spectral range of 2,3 µm, making it the ideal IR pyrometer for temperature measurement of metallic surfaces starting from 50 °C. It also allows for measurements through glass. The intelligent LED display works optionally as alarm signal, target support, self-diagnosis or temperature-code display.

Enquiries: Scott Hunter. Tel: 010 595 1831 or email sales@instrotech.co.za

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SOUTHERN AFRICAN
ENERGY EFFICIENCY
CONVENTION

PRESENTED BY

11-12 NOVEMBER 2015 • EMPERORS PALACE • GAUTENG

The 2015SAEEEC features a convention agenda with seminars and an exhibition on a variety of current topics and a comprehensive overview of "Energy Efficiency @ Work". The 2015SAEEEC together with the exhibition target the complete spectrum of technologies and services of great importance to over 500 delegates. Learn from more than 80 knowledgeable speakers in the energy efficiency force and become part of the answer!



2015SAEEEC DELEGATES

Delegate Full Registration	R 6 636.00
SAEE Member	R 5 530.00

2015SAEEEC EXHIBITORS

1 x Exhibitor stand (3m ²)	R 17 100.00
2 x Exhibitor stands (3m ²)	R 32 490.00
1 x SAEE Corporate Member stand (3m ²)	R 15 050.00
2 x SAEE Corporate Member stands (3m ²)	R 28 595.00

2015SAEEEC SPONSORS

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FOR MORE INFORMATION, PLEASE CONTACT US

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 Email: convention@saee.org.za
www.saee.org.za/about.aspx



Partnership launch

ACDC Dynamics, with their international partners Aucom and Vacon, held an event on 25 March 2015 at Emperors Palace to launch the Southern Africa and African strategic partnership. The partnership strengthens and extends ACDC's product lines with two of the most recognised brands in their categories in the world. ACDC has extended its sales team to enable the sales and technical support for the drives and soft starter ranges to customers. Enquiries: Tel. 010 202 3300 or email SaraR@acdc.co.za



Guida Maio (ACDC Dynamics, managing member), Mario Maio (ACDC Dynamics, managing member), Francisco Andre (SEZISEC).



Anil Jugmahan (ACDC brand manager), Mario Maio (ACDC managing member), Ricky Tiong (Aucom).



Charles Woods (ACDC Green), Sara Ross (ACDC marketing manager), Paul Jackson (ACDC sales manager).



Roger Burrows (ACDC panel and transformer workshop manager), Raymond Geldenhuys (electro sales).



Mario Maio (ACDC managing member), Ricky Tiong (Aucom brand manager EMEA), Romon Dot (Vacon – solar engineering EMEA), Anil Jugmahan (ACDC brand manager), Zsolt Lengyel (Vacon – EMEA Channel).

Launch of PowerWatch – online management portal for energy managers

Energy Cybernetics launched their latest energy management platform, PowerWatch, at the offices of EOH in Bedfordview on 26 March 2015. PowerWatch provides real time load analysis and reporting. It makes energy consumption visible to customers through a web-based energy management portal. The system converts consumption data into useful information which includes energy performance indicators, energy costs, emissions reports and real time condition alerts. It is a powerful and flexible energy management platform with many different uses.

Enquiries: Mariska Potgieter. Email support@cpowerwatch.com



Presenters at the PowerWatch launch were JJ (Karel) Steyn (SAEE board member), Jayeshkumar Ranchod (EOH) and Frikkie Malan (Energy Cybernetics).

All photographs: Helen Couvaras

Royal HaskoningDHV appoints Managing Director for South Africa



International Consulting Engineering Company Royal HaskoningDHV has appointed Salani Sithole as Managing Director for its South African operations with effect 1 March 2015. He has been with the company for six years. With his wide spectrum of knowledge and experience, as well as his thorough understanding of the company he is well placed to further develop the South African operations.
Enquiries: Hillary Erasmus. Email hillary.erasmus@rhdhv.com

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Africa Automation Fair 2015

5 – 7 May 2015,
The Dome, Northriding,
Johannesburg
Enquiries: www.africaautomationfair.com

15th annual African Utility Week and Clean Power Africa conference

12 - 14 May 2015,
International Convention Centre,
Cape Town
Enquiries: Email nevenka.ristic@spintelligent.com

Energex Africa

For manufacturing, engineering, water, petrochemical, plastics and energy sectors
20 – 22 May 2015,
Gallagher Convention Centre,
Midrand, Johannesburg
Enquiries: Email sales@exhibitionsafrica.com

Safety Control Systems & Hazardous Areas conference

27 – 28 May 2015,
Gallagher Convention Centre,
Johannesburg
Enquiries: Tel. 024 5520/1/2/3/4/5 or email marketing1@idc-online.co.za

The 3rd POWER-GEN Africa and DistribuTECH Africa

15 – 17 July 2015, Cape Town International Convention Centre, Cape Town
Enquiries: Email ferrial@tradeprojects.co.za

ICUE-2015 Conference (Industrial and Commercial Use of Energy)

17 – 19 August 2015, Cape University of Technology
Enquiries: Email icue@cput.ac.za

4th Annual Infrastructure Africa

1 – 2 September 2015, Sandton Conference Centre, Johannesburg
Enquiries: Email liz@infrastructure-africa.com

25th AMEU Technical Convention 2015

4 – 7 October 2015,
Sandton Convention Centre, Johannesburg.
Enquiries: Jean Venter. Tel. 011 061-5000

Energy Training Foundation (EnTF) courses 2015

Enquiries: Tel. 041 582 2043 or email info@entf.co.za • thieda@entf.co.za
Visit www.energytrainingfoundation.co.za



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industrial
technology
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KZN Industrial & Technical Expo
9 - 12 June 2015
Dbn Expo Centre Stand D24



Industrial Showcase CT

1 - 3 July 2015
CTICC Cape Town
Stand no. B45



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