

Bulletin

Association of Electrical & Mechanical Trades

New KSB Pump

CBC Electric Machines Award

Sulzer Cruise Ship Generator

Exico Motors

EMIR Smart Site

Sulzer Refinery Compressor

Quartzelec Leeds

ATB Tidal Technologies

CWIEME Berlin2015

Houghton Int. Traction Motors

New Canned Motor Pumps for Chemical and Process Engineering Applications

ACHEMA 2015 will see KSB Aktiengesellschaft, Germany, showcase totally leak-free canned motor pumps from the Ecochem Non-Seal range designed to transport hazardous, aggressive, flammable and explosive fluids. The pumps are also capable of handling toxic and extremely hot or cold media as well as volatile or valuable liquids.

This new type series combines KSB's MegaCPK – a standardised chemical pump successfully employed for years in process engineering – with ground-breaking canned motors built by Japanese cooperation partner Nikkiso. The pumps' dimensions comply with ISO 2858 and meet the requirements of the DIN/EN/ISO 15783 and API 685 standards, with economic operation being ensured via a new energy-optimised electric motor design. The low-noise motor features a corrosion-resistant can made of Hastelloy (2.4610).

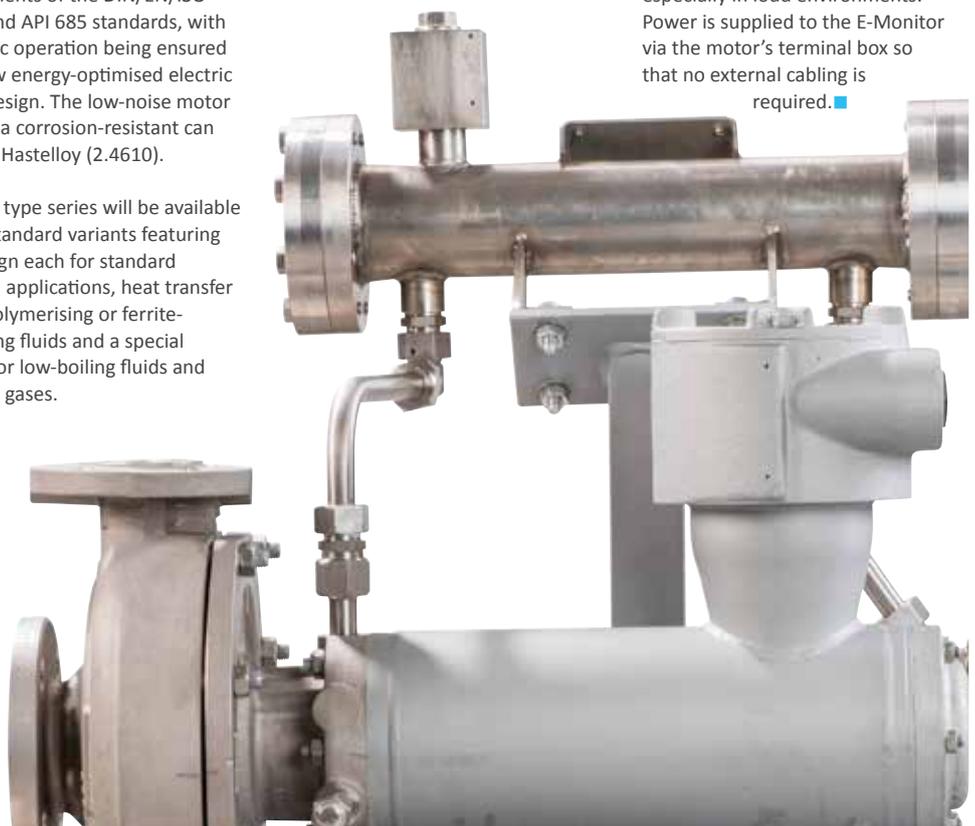
The new type series will be available in four standard variants featuring one design each for standard chemical applications, heat transfer fluids, polymerising or ferrite-containing fluids and a special variant for low-boiling fluids and liquefied gases.

The pump sets have been designed to meet the requirements of explosion protection class II 2 G c Ex de IIC to ATEX, TR and IEC Ex and temperature classes T1 to T5, and can handle fluids at temperatures from – 40°C to + 400°C as standard. The maximum head is 236 m and the maximum flow rate 690 m³/h, while product-lubricated plain bearings made of pure silicon carbide or a silicon-carbide-graphite compound allow the bearing configuration to be optimally matched to the pump's operation and the fluid handled.

If required, the pump casing can also be heated to avoid a blockage developing due to fluid cooling and becoming viscous or solid in the

event of standstill. The motors are rated up to 75 kW, and with 16 different motor sizes available, the drive can be precisely tailored to demand. Thanks to the motor bearings' modular design, the number of parts requiring storage can be reduced, cutting warehousing costs.

An E-Monitor available on option monitors the axial and radial condition of the bearings, and its integrated direction-of-rotation indicator eliminates the need for phase rotation measurements during commissioning. As canned motor pumps operate very quietly, the built-in operating status indicator provides a very useful function, especially in loud environments. Power is supplied to the E-Monitor via the motor's terminal box so that no external cabling is required. ■



Send us your News!

Please remember to keep us informed of your news so that we may publish it in our Bulletins.

Let us help. Even if you have some news to tell us, but nothing written.

admin@aemt.co.uk

AEMT Website

All the news found in this newsletter is also available to read on the new website.

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www.aemt.co.uk/news



Frank Barrett, CEO of CBC Electrical Machines Group, receiving reward from Jeremy Paxman. Also in the pic are Bryan Buchan chief executive of Scottish Engineering and Tom Sreeves President of Scottish Engineering.

Scottish Engineering Award Honours CBC Electric Machines.

The trade association Scottish Engineering recognised CBC Electric Machines Group (CBC EMG), which includes AEMT members Parsons Peebles and Preformed Windings, at their Annual Award's ceremony. The group was given the "President's Award for Outstanding Manufacturing Achievement 2015".

The event, which was also celebrating 150 years of Scottish Engineering, was attended by all of Scotland's leading engineering companies and CBC EMG were proud to be recognised for their achievements. Frank Barrett, CEO of CBC EMG, commented afterwards, "It's an honour to be surrounded by our peers and receive such

recognition. This is testament to the hard work the two companies that make up our Group, Parsons Peebles and Preformed Windings, have done to grow our capability globally."

Dave Hardy, Operations Manager at Preformed Windings, further added, "To be recognised by Scottish Engineering for what we've already achieved is great and is testament to the hard work and team spirit shown by all – from shop floor to management. We're not resting on our laurels though. Because our coil quality and lead times are industry leading we are needing to relocate to a bigger and more advanced facility to handle demand. This will happen in the next couple of

months so we're all set for the next phase of growth. We are spending over £2M to further raise the bar in terms of quality, precision and speed of delivery."

The award citation recognised CBC EMG's work to develop its people, apply advanced manufacturing techniques and its significant revenue growth year on year. Additionally Scottish Engineering highlighted the work conducted in CBC EMG's Rosyth facility to offer ever expanding motor and generator services. ■



Cruise Ship Generator Safely Repaired at Sea.

A generator failure on a large cruise ship can be effectively managed using modern back-up systems, while keeping the vessel at sea with passengers unaffected. To inspect, disassemble and rebuild one while the ship's passage remains unaffected, however, is technically quite an achievement; one that a Sulzer HV (High Voltage) generator repair team has recently completed while the ship in question remained

at sea.

Large civilian ships rely heavily on electrical power to provide passengers and crew with their daily comforts; such as lighting, communications, food, and entertainment. Recently constructed cruise ships also rely on electrical propulsive power, so the loss of generator power has the potential to cause concern on both accounts.

Having suffered a generator failure onboard a large cruise liner, an initial inspection by the ship's maintenance engineering team determined that the 7.5MW generator had a winding fault which would require a complete strip-down and new windings to be manufactured and installed. The challenge was taken up by Sulzer, as the company has considerable expertise in completing high voltage generator repairs in-situ,

as well as the facilities to design and manufacture new coils at very short notice.

The first step was to fly in a repair team who worked with the ship's engineers to dismantle the generator and determine the exact fault with the original windings. With space on a cruise ship at a premium, the engine room does not afford the same advantages of a purpose built



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A closer inspection of the stator revealed that the OEM design of the coils had a flaw and that had caused the generator to fail. Sulzer suggested a modification to the design to ensure that a similar failure would not reoccur and this was incorporated with the rest of the coil design details and sent to Sulzer's Birmingham Service Centre in the UK, where the coil shop started work on manufacturing the new coils.

The challenge of electrical power onboard large cruise ships

Electrical power generation on large ships is achieved, in the main, by either large diesel motors or steam turbines turning generators, which provide the power for the entire ship. Due to the essential nature of these power plants, the installed capacity allows for some generators to be off-line, ready to be started in the event of a generator failure. They are usually separated from each other to ensure that any damage caused to one generator does not affect another.

Most modern cruise ships now employ some form of diesel electric power, where the diesel engines just power a generator and the electricity is used to power electric motors which are connected to the propellers or thrusters. The main advantage of this system is efficiency; the engines can operate at their optimum speed, regardless of the speed of the ship.

However, if a generator does fail, it is essential that it is repaired as quickly as possible so as to minimise the disruption to the passengers and crew and maintain the ideal level of redundancy within the system. In most cases this would require the vessel to dock in the nearest port with suitable repair facilities; however, Sulzer has the expertise to complete a full repair at sea.

Achieving a Turnkey Service at Sea

Mike Stanley, General Manager at Sulzer's Birmingham Service Centre where the onsite repair teams are supported from, and the replacement HV coils are manufactured, comments:

"This project really needed a fast turn-around to ensure our engineers on the ship could get the generator

back up and running as soon as possible. Fortunately, we are very well equipped to achieve tight deadlines with all of the processes involved, from 3D CAD designers to fix the original design fault, through to rolling the raw copper for the replacement coils in-house and the final high voltage testing, all carried out here in Birmingham.

"Once we understood the root cause of the failure we were able to modify the original design and start production immediately. This meant that while the new coils were being produced, the on-site engineers could finish stripping and cleaning the stator so that as soon as the new coils arrived they could be installed and connected."

With the new windings in place, they underwent a full series of tests to check the performance and the insulation resistance. Once complete, a temporary oven was created around the stator and the windings were cured, before the epoxy resin coating was applied and finally the windings were painted with a varnish based paint.

The team then reassembled the generator before testing, commissioning and finally returning it to normal service. The repair

project was completed in 40 days, with two teams working round the clock on 12 hour shifts which ensured that there was no interruption to the ship's schedule, no inconvenience to the passengers and no additional costs for docking the vessel.

Mike Stanley concludes: "This is a service which requires us to be regularly certified by Lloyds Register and Bureau Veritas to ensure continued compliance with marine engineering standards. Our ability to complete these repairs while at sea provides a host of benefits to the passengers as well as the ship's owners."

"Our Birmingham coil shop can produce resin rich coils to precise specifications within very short lead times, which allows the ship to continue its journey. The alternative is to replace the generator or repair it as a global VPI (Vacuum Pressure Impregnation) winding, both of which would require a dry dock situation and a large hole being cut in the side of the ship to allow the generator to be removed. Our solution clearly offers a far more attractive alternative." ■

Exico Motors are Back!

The Exico name is returning to the UK industrial motor and inverter drive market with some familiar people on-board. After a 10 years hiatus during which the original company was subsumed by a global conglomerate, the successful original format is back with an updated range and typically great technical support and customer service.

Based (again) in Wellingborough, Northamptonshire, Exico is targeting predominantly OEMs and re-winders with a full-range product offering; including plenty of UK stock and a modification service. The highly experienced technical support team are also based at the East Midlands site and so are directly available to customers who want instant advice on motor specification and problem solving.

Sales Director Lucie Hodkova explains the strategy: "We have high growth targets because 'critical mass' is important in our field, however we know how much business relies on personal trust and convenience, so we are aiming to offer great deals but also ensure our customers' working lives are made easier by dealing with us. This is why we believe our high service level is so super important.

"We need to be big enough to service our clients in the way that they want us to and for those who do not remember Exico from the first time around to know who we are and to be confident that we can meet their motor needs. Our initial target is £1m turnover in the first year, which we are likely to hit a lot sooner than year-end based on the first quarter results."

"High on our agenda is building a national network of distributors. We already have four

in place and will be assessing more potential partners to ensure we have good geographic coverage and are represented in all our key sectors."

Exico's motor range includes: single phase motors; three-phase motors (IE1, IE2, IE3 and IE4); ATEX explosion-proof motors; marine motors; medium and high voltage motors. It also supplies variable speed drives, gearboxes, accessories such as brakes, fans, encoders and slide rails and coolant pumps for machine tools.

"For some of these variations, such as ATEX, we either have or will shortly have the new company fully certified," says Lucie. "These are priority objectives within our strategy."

Lucie and her colleagues believe that there is a need in the UK for quality European manufactured electric motors at affordable prices. Exico actually traces its early history back to Czechoslovakia; where its motors are still made today in a highly-automated modern factories and shipped around the world. Many single-phase and three-phase motors being brand labelled for global companies.

As well as standard motors Exico UK is able to build integrated drive packages and to supply bespoke motors with, for instance, windings for non-standard voltages, shaft modifications, fitted brakes and encoders, and marine motors for use both on and below decks. Much of this technical work is directly

overseen
by



Jerry Hodek, UK Managing & Technical Director of Exico

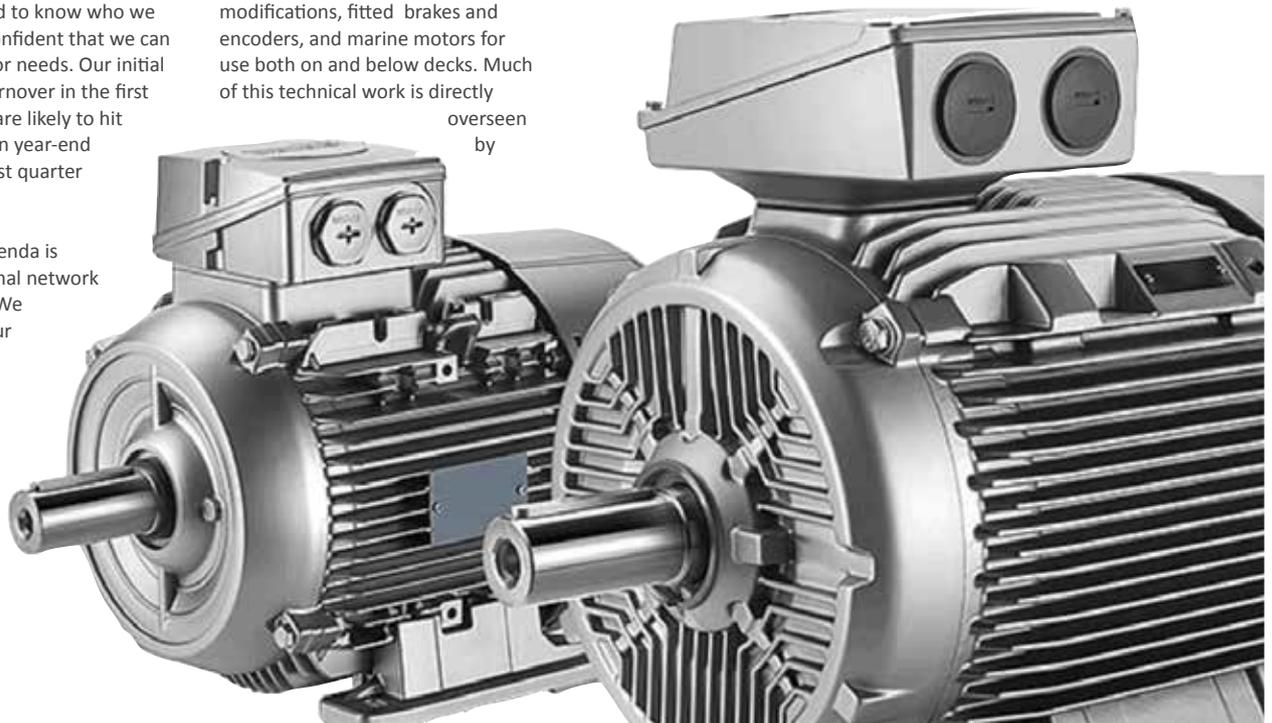
Managing & Technical Director Jerry Hodek, who has a Masters degree in electrical engineering and 25 years experience in the motors industry.

Completing the start up team is technical and sales Manager Magda Bartosova, who, like Lucie, can claim a decade worth of experience with industrial motors. Between these three people six languages are spoken; English Czech, German, Russian all fluently, with Mandarin and Arabic at a more basic level.

"Languages are a bit of a passion with me," says Lucie, "so I am looking forward to developing an export business as well serving the UK market."

There is already an installed base of Exico motors around Britain, which the new team is keen to service and support. In the 10 years since Exico was last active, the performance and efficiency of electric motor technology has developed considerably. So there is a drive to re-approach previous customers and help them make sure their machines and processes are as energy efficient as possible.

"Motor users always need support, and Exico is committed to becoming the service standard by which other companies are measured." sums up Lucie. ■



The Authors of EMIR Launch Smart Site.

Electro-Mechanical Information Resource, EMIR for short, is a market-leading business software application for the electro mechanical industry.

Now in its 21st year of production, EMIR is used by over 2,000 users around the world and provides an integrated software suite managing; repair & site service, sales & distribution, assembly & manufacture and hire fleet management.

“As a modular solution it was a simple progression to take the functionality of EMIR out to where engineers could use it more effectively - on-site!” Gary Downes, the company’s Managing Director comments

EMIR Smart Site, an Apple IOS and Android Application was launched on the 9th of June at the “EMIR Open Day” at Old Trafford, the home of Manchester United F.C.

“This is not the first mobile application we have developed, but it is the first that we have designed to work with iPhones, iPads and Android handsets and does not

require internet connectivity at the time of use

The premise of capturing pictures and job information whilst on site means that EMIR is instantly updated with out the need for extra administration.

Work schedules are no longer paper based, all of the data recorded about the job, spare parts, time and photographs are attached to the history during the engineers visit and jobs can be invoiced immediately on completion with a customer signature and signoff.

When you begin to realise the benefits of this type of data capture and integration, the stress of managing site work is dramatically reduced.”

Some benefits of EMIR Smart Site:

- Online ‘live’ and offline working.
- A simple to use interface that relays the key information on the job and its completion.
- Images taken on the mobile device are automatically attached and



- saved to the EMIR job record.
- Working on IOS and Android devices.
- The reduction of paperwork will appeal to engineers and business owners alike
- Capture of information at source

means information is logged efficiently.

The EMIR Smart Site application will be available shortly. ■

Re-Engineered Rotor Improves Performance for 4 MW Refinery Compressor

Large centrifugal impeller compressors are commonplace throughout the petrochemical sector, where they usually operate on a continuous duty basis. When a scheduled maintenance task at a refinery in Germany revealed the need for a new rotor assembly, working with specialists from Sulzer enabled the team responsible to improve the design and performance of the compressor without further interruption to service.

The individual roles of centrifugal compressors are many and varied, depending on the process in question, but one constant remains – the need to perform reliably. Rigorous maintenance schedules and condition monitoring are usually employed to ensure that reliability and efficiency are maintained. Continuous service is also ensured in this case by maintaining a spare rotor assembly for each compressor which allows any repairs to be completed

without any impact on the refining process.

This particular project started when the maintenance engineers were completing a rotor change on a 4 MW centrifugal compressor as part of a routine maintenance programme. Once the rotor had been removed from service, a visual inspection showed damage to the impeller blades, with both cracks and heavy erosion in evidence. The repair project would require a range of skills and equipment all of which would be coordinated through Sulzer’s Jänschwalde Service Center, which would act as the single point of contact for the client.

Previous to the rotor being changed, issues had also been raised with the performance of the inter-coolers on each stage of the four stage compressor, which were becoming less efficient. With the original



Each impeller was spin tested before being mounted onto the new rotor shaft to ensure the integrity of the impeller construction when operating under load

➤ Continues on page 6

➤ Continued from page 5

compressor having been built in the 1970's, the inter-coolers had reached the end of their design life and were due for replacement. A set of new, more efficient inter-coolers had therefore been purchased and were ready for installation.

At this point the reliability engineer at the refinery was presented with several options to consider with regard to the rebuilding of the rotor under repair. The project could allow several improvements to be made to the performance and efficiency of the compressor and also ensure that the new inter-coolers performed at optimum efficiency.

Initial contact was made with the original equipment manufacturer (OEM) as well as Sulzer, which specialises in the servicing of rotating equipment and already had a service station located on the refinery site. Sulzer was able to offer a complete solution including design, analysis, evaluation and manufacturing from a single source that also proved to be more cost effective than the OEM option.

The project was divided into two tasks: the repair of the rotor and the investigation into design improvements that could increase performance and efficiency. By selecting Sulzer, the client gained access to the extensive knowledge and expertise of its engineers with the Rotterdam Service Center providing specialist skills for compressors. The project was managed by the Jänschwalde Service Center to provide the client with coordinated feedback and progress reports.



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Performance Enhancement

The most obvious hurdle to improving the design of the rotor was the lack of access to the stationary section of the compressor, since it was still in operation with the replacement rotor inside. However, Sulzer engineers used their experience and expertise to work around this, starting with a complete scan of the rotor shaft that was digitised into a 3D CAD model to work with.

The first task was to recreate the compressor, in its current configuration, as a 3D model and to use the latest software to generate a performance chart for the complete compressor, including the existing inter-coolers. The data

generated from this model was then compared to the actual data from the compressor itself. In this way the model could be refined to ensure that the correct working parameters were being used.

Once the accuracy of the model was confirmed it was then possible to introduce design improvements to the impellers, the labyrinth seals, the inter-coolers, the bearings and the shaft itself. Each design change was simulated and evaluated in order to compare the performance of the alternative designs.

Since the impellers were already damaged, they would have to be replaced but modern design and manufacturing techniques would

allow for much higher efficiency components to be installed that would also utilise the additional capacity of the new inter-coolers. Modifications to the vane geometry would ensure the optimum inlet flow angle which would also improve the mass flow rate (MFR).

Further improvements were also evaluated for the labyrinth seals, where the introduction of a polymer material would allow the seal clearance to be reduced which would reduce losses from the compressor. Each modification was assessed for its benefit to the performance of the compressor before being presented to the client.

The evaluations showed the



Modifications to the vane geometry would ensure the optimum inlet flow angle which would also improve the mass flow rate (MFR).



The evaluations showed the most significant performance improvements would be as a result of optimising the four impeller stages.

most significant performance improvements would be as a result of optimising the four impeller stages and installing the new coolers which would result in a 20% increase in MFR. Of this only 2-3% of improvement would be as a result of changing the inter-coolers, the majority came from redesigning the impellers. An additional 3-4% could also be gained through changing the labyrinth seal material and improving the clearances.

Manufacturing Precision

Having costed the various proposals from the Sulzer engineers, the client selected changes to the impellers while choosing to hold off on the remaining improvements for the present time. Having perfected the 3D designs, it was just a simple task of creating the manufacturing drawings for the engineers that would complete the final stage of the project.

Sulzer has a comprehensive range of machining tools and manufacturing facilities that can create new components for centrifugal compressors as well as many other pieces of equipment. In this particular case, the client

chose to use the facilities on-site to manufacture the rotor shaft, while Sulzer had the responsibility for creating the new impellers and the stacking of the rotor, including the necessary inspections associated with this process.

Whereas the original impeller was a welded design, the new components would be manufactured from a solid piece of chrome molybdenum vanadium steel using electrical discharge machining (EDM). This precision process delivers, in this case, a much stronger and more durable component than the original, partially welded construction that will also exactly match the expected performance characteristics in the evaluation process.

Each impeller was spin tested before being mounted onto the new rotor shaft to ensure the integrity of the impeller construction when operating under load. In accordance with American Petroleum Institute (API) specifications, the spin test speed is carried out at 115% of maximum continuous speed (MCOS).

The shaft itself was low speed balanced before each impeller stage

was installed and then again once the assembly was complete. The operating speed of this rotor is over 8,800 rpm and the balancing was carried out at rated speed as well as at 10% over-speed, as agreed with the client.

Sulzer can also offer a variety of anti-fouling coatings that can be applied to the rotor to improve durability and efficiency, but in this case the client requested the complete assembly to undergo trowalizing. This process is designed to refine the surface finish of all surfaces and involves immersing the component in abrasive media and a vibrating action being applied to the container. Gradually the component is polished by the media and eventually has a near mirror finish.

The completed rotor assembly was delivered to the client ready for installation during the next scheduled maintenance period, along with the new inter-coolers. The entire project was managed and coordinated through the single point of contact in Neuss, which enabled both the client and the project engineers to have a clear understanding of the scope, costs and progress throughout. ■



Quartzelec now in Leeds

Following a number of significant recent contract wins, the Manchester operation of Quartzelec, offering Electrical & Mechanical Services, has opened a new office in Leeds to meet growing customer demand across the region.

Recent local electrical contracting successes for the business, include two phases of Refurbishment/New Build at the White Rose Shopping Centre, Leeds (£1m), a recently completed new bus station in Castleford (£600k), extensive refurbishment to Sheffield Cathedral (£700k), Refurbishment of 182 apartments at Park Hill, Sheffield for Urban Splash (1.25m), and extensive building services refurbishments at The Art House, Wakefield (£700k).

“We continue to tender for and be awarded prestigious electrical contracting contracts across the region,” stated Martin Broughton, General Manager for Quartzelec’s Manchester operation. “Opening an office in Leeds was therefore the logical next step to increase our presence and better service the growing number of local customers. We have seen our contracting business grow by 38% and 50% respectively over the past two years and everything indicates that this is set to continue.” ■

AEMT Training Calendar

*Alteration

2015			
June 15-16th	Aberdeen	Ex Theory Course	Mod 1
June 17-18th	Aberdeen	Ex Hands-on & Refresher	Mod 2R
*July 20-21st	Isle of Man	Ex Hands-on & Refresher	Mod 2R
*August 31-1st	Dubai	Ex Theory Course	Mod 1
September 2-3rd	Dubai	Ex Hands-on & Refresher	Mod 2R
September 8-9th	Loughborough	Ex Theory Course	Mod 1
September 10-11th	Loughborough	Ex Hands-on Course	Mod 2
September 15-16th	Loughborough	Ex Hands-on Refresher	Mod 3
September 28-29th	Thailand	Ex Theory Course	Mod 1
September 30-1st	Thailand	Ex Hands-on & Refresher	Mod 2R
October 13-14th	Loughborough	Ex Hands-on Refresher	Mod 3
October 19-20th	Singapore	Ex Theory Course	Mod 1
October 21-22nd	Singapore	Ex Hands-on & Refresher	Mod 2R
November 2-3rd	Aberdeen	Ex Theory Course	Mod 1
*November 4-5th	Aberdeen	Ex Hands-on & Refresher	Mod 2R
November 16-17th	Qatar	Ex Theory Course	Mod 1
November 18-19th	Qatar	Ex Hands-on & Refresher	Mod 2R
December 1-2nd	Loughborough	Ex Theory Course	Mod 1
December 3-4th	Loughborough	Ex Hands-on Course	Mod 2
December 8-9th	Loughborough	Ex Hands-on Refresher	Mod 3

ATB Morley Explores Tidal Technologies.

ATB Morley exhibited at the prestigious All Energy exhibition at the SECC in Glasgow during May, promoting electric generators for renewable power. Morley's capacity to bespoke engineer machines to the requirements of its customers' extends perfectly to the renewables sector. Recently the company has enjoyed success in tidal power generation in particular.

Tidal power exploits the natural ebb and flow of tidal waters, caused principally by the interaction of the gravitational fields of the earth, moon and sun. It has the potential to make a material contribution to the UK's energy mix in the next decade, with vast quantities of predictable, reliable and consistent tidal energy surrounding our vast coastlines.

Yet in 2014, the UK generated just 5.2% of its power from renewable resources; narrowly over one quarter of the way towards the binding EU target of 20% set for 2020. Tidal technology companies are trialling a diverse range of technologies in order to identify the most effective methods of power generation, from tidal turbines through to oscillating devices, flow augmented and crossflow turbines. Whilst there are now many prototype models in operation, mainstream commercial installations are limited in number.

The key challenge facing the tidal energy industry is lowering the capital costs of energy generation.

Industry experts claim that a sustained focus on innovation is pivotal to harnessing the potential of tidal energy, as this will guarantee the acceleration of cost reduction is sufficient to reduce the cost of energy down to competitive rates by 2020.

The winning solutions for commercial scale tidal projects will have the correct balance of output to installation and capital costs. These generators convert kinetic energy from the ebb and flow of the tide, utilising mechanical energy as the intermediary. Two systems have emerged with huge market potential.

Fixed installation nacelle mounted generator

In 2013, ATB Morley supplied a generator for an axial tidal turbine. The generator was installed in an enclosed nacelle behind the turbine's propellers and mounted on its large supporting structure. The generator was equipped with a range of features, including: oil bath lubricated bearings to ensure a five year maintenance free period, a water cooled outer jacket that pumps fresh seawater through a heat exchanger on the nacelle wall, a comprehensive online monitoring system utilising PT100 RTD's and vibration sensors.

The innovative structure of this turbine ensures that the internal equipment is secure in a dry nitrogen

purged pod, avoiding any possible contact with seawater. All internal cabling can be of an industrial standard and consolidated into one subsea cable for transmission to the shore, such is the protection provided by the nacelle. This tidal setup is not without its drawbacks however; the generator is submerged beneath the sea surface, therefore maintenance and installation procedures are time consuming and financially imposing.

Mechanical and electrical subsystems incorporated in the generator design can be costly, such as the heat exchanger and pumps to remove the heat from the generator to the sea.

Gravity mounted, direct seawater cooled generator

ATB Morley was also selected to build a generator for an exposed, gravity mounted, axial turbine structure with components directly in contact with the sea.

This required a generator of a robust mechanical design, which would allow it to cope with the harsh climate beneath the water. A special active surface coating was applied to the machine and it was also fitted with double O-ring seals. Additionally, a high slip motor design allowed for constant power fluctuations in turbine speed.

This tidal technology benefits from a cheaper installation than that of the

previous and is far less intrusive on the sea bed. The requirement for a heat exchanger is also negated as the generator is exposed to sea water.

As all the components are continuously in contact with water, issues such as corrosion and unexpected marine growth are common. All seals and cabling must be IP68 and suitable for the water depth, meaning cheaper industrial cabling is simply not an option. Despite this, the system is designed to be a lower cost option than the fixed base nacelle installation.

Another obstacle is replicating the underwater environment that this machine would be installed in during factory testing. Whilst marine industry practices can be followed to determine water tightness for example, using helium gas leak testing, mimicking the cooling water immersion in a factory setting remains a complexity, so the exact efficiency of the generator is difficult to determine prior to its installation, which could be seen as a risk for potential investors.

Whilst tidal technology is continuously evolving, it is still in a nascent stage, thus a single method of power generation has not yet been acknowledged as the most effective. This is an exciting time for developers, who have the opportunity to revolutionise tidal power through innovation. ■



Fixed installation nacelle mounted generator



Gravity mounted, direct seawater cooled generator

The AEMT at CWIEME Berlin 2015



Thomas Marks of the Secretariat at the AEMT stand at CWIEME Berlin 2015

The AEMT supported the very successful CWIEME Expo 2015 in Berlin held in May at the Messen Berlin. The Coil Winding, Insulation, and Electrical Manufacturing Exhibition, which over a period of nearly 20 years has become the leading international show in these niche areas.

The event is now organised by i2i events, who have made the show very professional; it now attracts over 5,000 visitors to more than 700 stands. This year the numbers may have been slightly lower due to an unusual German rail strike that lasted the whole week, although that didn't stop the show from being one of the most successful yet.

The Expo has grown internationally with the number of locations for the exhibitions increasing from just Berlin in May, to Shanghai in June, Chicago in October, Istanbul in November, and Bangalore next year.

The coil winding side has stands for the smallest miniature transformers and micro coils, manufactured in large numbers throughout Asia, up to the largest power transformers. There were a wide variety of suppliers and machines covering all aspects of the manufacture of electric motors and generators. Despite the new expo's in China and India, it has not diminished the large representation of companies from these areas. This year over 60% of visitors to the Berlin show came from outside Germany from around 100 individual countries.

Perhaps the largest stands are taken each year by the suppliers of the raw materials such as Arcelor Mittal for electrical steels, laminations, copper wire and copper bar, a growing

number of magnetic material suppliers, copper rotor supply companies, and also substantial stands for the insulation and varnish companies. There is also a growing volume of computer modelling, simulation, and test equipment.

Some AEMT members that take a stand every year and this year they were all particularly busy. AEV with its worldwide distribution network was as busy as ever on the varnish, and insulation and compound side. The AEV Process Technology Division was also receiving a lot of interest in their VPI plants which now range in size from 500mm up to 5 metres in Diameter.

Ridgway Machines had a lot of interest in their Strip and Cut line which delivers pre-set cut lengths of copper with stripped ends. Andy Clarke the sales and marketing director was also pleased to receive an order for a BCT taping machine from a longstanding international manufacturer. They will also be exhibiting at the Shanghai CWIEME in June.

The varnish companies were all well represented and busy, as well as AEV, Elantas Beck (Altana), and Krempel (Jones Stroud) had large busy display stands.

For the repairers there were good display stands for SKF and Baker instruments with Mike Herring on the stand, CAM industries, and Scheing with a fully automatic WM 4500 winding machine on their stand, distributed through Whitelegg Machines.

The AEMT stand was also visited by Wire Electric, AEV, PAR, Rotary, Quartzelec, and also a number of

leads for AEMT membership and courses, which made the event worthwhile.

John Moody of Anglo Carbon & Contacts was able to give an AEMT presentation and workshop on carbon brush technology, and their new range of wind turbine brushes. He was delighted by the response which led to some meetings with major potential customers during the show.

Although originally designed as a manufacturers show, rather than a sales and service show there is always lots that is of interest in the ways that equipment is developing, test equipment, and some repair equipment stands. There is also an excellent programme of technical cutting edge presentations running throughout the show, and a series of smaller workshops. ■



Winner Sheng Yuan receives his prize from judging panel member Giorgio Cacopardo of Marsilli.

CWIEME Challenge Final

There was also the CWIEME Challenge Final, which produced 4 extremely worthwhile projects being carried out by university students. Sheng Yuan was awarded 1,000 Euros for his winning project on Magnetic energy harvesting.

Sheng Yuan from Liverpool University in the UK impressed the judges, with his live presentation to the Challenge judging panel at CWIEME Berlin, which included the AEMT Secretary Tim Marks.

The Magnetic Energy Harvester project focusing on the potential to harvest magnetic field energy to power condition monitoring devices, such as partial discharge sensors and infrared detectors at electrical substations, and real-time weather stations beneath overhead power lines.

Sheng discovered that a novel bowtie-shaped core had a much higher magnetic moment, and as much as five times greater power output than a conventional

solenoid, and a switch in the matching circuit could increase transmission efficiency by 30%.

The other projects were presented by Lukas Kistner and Marcel Nöller for the design and construction of a high power low weight electric motor for an electric racing car for the KIT15e Motor Project

Marc England designed an Integrated Drive-Motor-System making a very compact design of motor with onboard inverter and cooling for a project initiated by Lenz.

Łukasz Waluś presentation was the implementation of isolated DC/DC converter powered by DC circuit of voltage inverter.

The next call for entries launches in Autumn 2015, so if you know of anyone who may have a winning project for next year's CWIEME Email chloe.theobald@i2ieventsgroup.com to register their project. ■

Houghton International Launch Rail Repair Services

Houghton International have launched a bespoke repair services to meet the increasing needs of the rail industry. Developed in response to customer demand they have broadened its offer to include DC line inductor and High Speed Train (HST) alternator repairs.

In addition to the weather proofing programme for DC line inductors, Train Operating Companies (TOCs) now have the option to repair rather than replace faulty units. This offers both a significant cost saving and substantially reduced lead times against buying new.

Michael Mitten, CEO of Houghton International, commented: "Building on our many years of experience in the life extension of AC and DC traction motors, we have strengthened our in house capabilities and can now offer customers the option to repair their DC line inductors rather than buying new ones. HITIG, our patent pending technical welding process for the repair of high current windings,

repairs damaged line inductors and restores functionality.

"Repairing, rather than replacing, can keep the inductor in service for years to come. We are the only company in the UK offering this service and believe it represents an opportunity to reduce costs and improve responsiveness when failure occurs."

RISAS approved, Houghton International can also offer an alternative to Original Equipment Manufacturers (OEMs) when it comes to HST alternator repair.

Michael continued: "There has long been customer demand for an alternative supplier to traditional OEMs. We have developed our skills and experience to enable us to offer customers an HST alternator repair service, customers will benefit from big cost savings and an improved service.

"Well placed to compete in this market, we offer a wide range of services to the rail industry and our

skilled engineers have worked on alternators in the marine and oil and gas industry for several years. Independent of the OEMs, we have a strong culture of continuous improvement at Houghton International that allows us to be responsive to our customer's requirements and develop solutions to meet their needs.

"We recently completed an HST alternator repair for First Great Western. Not only were we able to repair the alternator and restore function, our skilled engineers also improved the performance by reducing the running temperature thereby increasing the power output."

Established in 1984, Houghton International specialise in the repair and maintenance of AC and DC traction motors and motor alternator sets.

HITRANS™ is their patented transient dynamic motor alternator set test process that electrically simulates

full load condition of any type. Meaning that units can be tested at full working load before leaving the facility. HiTRAX™ combines insulation materials that have the greatest dielectric durability throughout the wide temperature range traction motors are exposed to in their life cycle.

By combining HiTRANS and HiTRAX with their high voltage expertise, Houghton International are able to work with Rolling Stock Operators (ROSCOs), TOCs and bogey overhaulers to reduce costs and improve company reliability by extending the life of their rotating machinery.

Following significant investment in new facilities, including silicone and epoxy VPI plants, Houghton International is set up to deliver an end to end service including consultancy, analysis, repair, test and impregnation of traction motors, MA sets, HST alternators, DC line inductors and other auxiliary equipment. ■

Equipment For Sale



8-5 Converters & LEDs

Lawton Electrical Services Ltd

Converts any T8 or T12 to T5 High Efficiency light unit.

50% - 65% Energy Saving

50% Reduction in Maintenance Costs

50% Reduction in CO₂ Emissions

2ft 8-5 conversion kits:
£5.00 each £2.50/100

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5ft 8-5 conversion kits:
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6ft 8-5 conversion kits:
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8ft LED 40 watt kits:
£49.99 each

Inclusive of delivery on all orders.

Tel: +44(0) 1484 851355
Email: info@lesl.co.uk



Axial Fan Unit

Lawton Electrical Services Ltd £200+VAT or nearest offer

Unused fan unit for sale as follows:
1 Nuair circular cased axial fan complete with 4kW motor 950rpm, Type AX100DP-623, 140kgs, 400V, 50Hz, 9.4amps Incorporating one metre diameter fan

Photographs of same can be transmitted to those interested or inspection at our Service Centre by prior arrangement with Stuart Lawton or Steve Peel

Tel: 01484 851355

Surplus 3 Phase Motors

Electric Motors Ltd - Northampton have a few motors that are surplus to their requirements. They are all new and unused.

Leroy Somer, 9kw, 4 pole, 132 frame, B3 (both B5 & B15 flanges available)

Leroy Somer, 9kw, 2 pole, 132 frame, B3 (both B5 & B14 flanges available)

Leroy Somer, 30kw, 2 pole, 200 frame, B3

Leroy Somer, 30kw, 4 pole, 200 frame, B3

Leroy Somer, 37kw, 2 pole, 200 frame, B3

Leroy Somer, 37kw, 4 pole, 225 frame, B3

Leroy Somer, 90kw, 4 pole, 280 frame, B3 - 2 off

Leroy Somer, 280kw, 2 pole, 315 frame, B3 Drip proof

WEG, 18.5kw, 2 pole, 160 frame, B3-B5 flange available3

Telephone: 01604 587700
Email: enquiries@elemoto.com

Job Positions Available

AEMT

Senior Consultant for Hazardous Area Rotating Equipment. CompEx/IEC Ex Lecturer & Assessor

Location: York, North Yorkshire



Your Role in the AEMT

- To outline and help develop bespoke training courses
- To improve on our current training material
- To lecture on IEC Ex standards and other topics at AEMT training courses, in conferences, seminars, and at AEMT Meetings and Events
- To contribute to the development of IEC, BS, and EN standards committees.
- Initiate projects and research papers that may contribute to future updates of standards
- To write compelling and interesting articles for publication in our Journal, through PR and on our website.
- To network and expand the contact base of the AEMT from a technical viewpoint.
- To manage technical queries coming in to the AEMT from its members, and to log and record the communications appropriately.

First 3 Months

On boarding to the AEMT. Training in any areas of knowledge that are required for the job role. Reading and research of necessary technical standards and publications. Building your own work regime and quality standard procedures.

First 6 Months

You will be in a position to support our lead lecturers on our current training courses. You will start contributing to, writing and completing our future training courses based on Units 01-09 of IECEx Personal Competency scheme.

1st Year Accomplishments

You will be an active member of our lecturing team helping out with our IECEx courses as a lead lecturer internationally. You will have an idea of where research and development is needed and have plans outlined to fulfil these goals.

2nd Year Accomplishments

After completing your second year – you will have fully resumed all responsibilities that are required of you. You will be aware of key areas the AEMT are strong in and building the association's technical front in research and development as well as continuing with training/education and committee representation. You will become a leading expert in the hazardous area field.

Key Qualifications and Experience

- CompEx Trained Engineer, or fully conversant with ATEX requirements.
- Degree, Masters, or Phd level in relevant areas such as mechanical or electrical engineering.
- Ideally an understanding of Units 01-09 of IECEx Units.
- A good knowledge of IEC 60079-14 (installation), IEC 60079-17 (maintenance and inspection), IEC 60079-19 (repair and overhaul), IEC 60079 protection concepts (Ex d, e, i, tD, p, o, m, n, c, etc.).
- Evidence of/or portfolio of written work, ideally including articles, research papers, press releases.
- Preferably trained in teacher training or as a competent lecturer.
- You will bring with you a strong network of contacts within the industry

in the UK and possibly internationally, that you will be able to build upon and utilise.

Benefits

- We are an international organisation, with plenty of opportunity for travel.
- The office is small, so you will join a close team and be able to work flexibly around your own studies and holidays.
- Respectable working hours normally 9-5 leave you plenty of time to enjoy your own time in the evenings and at weekends.
- Working in the heart of one of England's most beautiful cities: York. With a view of the majestic York Minster from the office.

Please send us your CV and covering letter demonstrating how you fulfil the requirements above, including some examples of your written work. Consider your experience and interests and outline how you feel you could be of help to the AEMT.

Contact

Tim Marks on admin@aemt.co.uk or call the office on 01904 674 899 for more information.

EMR Silverthorn Ltd

Electrical And Mechanical Fitter

Location: Greater London

- The candidate must be familiar with all aspects of AC motors, pump and fan repair and installation.
- Qualifications would be an advantage but experience and problem solving attitude will count towards a successful application.
- The role will be based at our repair facility in which is within walking distance of Alperton tube station, but if required the role will require some on site work and so a clean driving licence is required.
- Pay is commensurate with experience and skills and there is scope for progression for the right person.

Contact Details:

If you think you would like to be part of a team in a long established but forward looking company please submit your CV with a covering letter outlining your expectations to.

Chris Fletcher, EMR Silverthorn Ltd, Unit 1 Manor House Business Park 97 Manor Farm Road, Wembley, HA0 1BN. chris@emrsilverthorn.co.uk

Deritend

Mechanical Fitters, Motor Rewinders & Machinists

Location: West Midlands

Due to our continuing growth and development Deritend have a number of opportunities and are looking for qualified skilled engineers. Ideal candidates will have completed a full mechanical apprenticeship (City & Guilds).

- Engineers will be expected to work in our Midlands Division locations with a potential for site work for our key customers.
- Experience of the some or any of following would be beneficial to applicants
- Refurbishment of pumps, gearboxes, motors and rotating plant and equipment;
- Repairing and refurbishing centrifugal split case, end suction, multistage ring section, vertical turbine and submersible pumps;
- Operation of machines and equipment including lathes, millers with conventional bench work and ability to work in breakdown situations;
- LV/HV stator and armature winding.

Contact Details:

To apply please forward a copy CV to HR&payroll@deritend.co.uk or call 01902 426354 for more information

RE Field Services Ltd

High Voltage (HV) Test Engineer

Location: Yorkshire & Humberside

Key Responsibilities

- Perform an extensive range of electrical tests to approved safe procedures and relevant standards on a large range of electrical machines.
- Accurate recording and analysis of results.
- Writing of clear and concise technical reports including conclusions and recommendations.
- Liaison with customers over technical queries.
- Fault finding and emergency call out site support.
- Supporting multidiscipline teams of field service engineers during site projects.
- Supporting technical assessments of customer machines in works.
- Maintaining test and equipment records.
- Assisting with the further development and expansion of test facilities and equipment.

Key Qualifications and Experience

- Proven track record of conducting diagnostic testing including IR/PI, Tanδ, Hi Pot, PD, ELCiD, RSO & HF within a similar motor/generator service or manufacturing environment.
- Educated to minimum HNC/HND level in a relevant engineering or technical discipline.
- Have practical experience in high voltage electrical testing of large electrical machines.
- Knowledge and experience of working to standards.
- Self-motivated with a high regard for safety and quality.
- Fluent English speaking with good verbal, computer and writtenskills.
- Highly organised and able to work with minimal supervision or within multi-skilled team.
- Familiarity with Automatic Voltage Regulators, Excitation Systems, Generator Protection Schemes and I & C circuitry would be an advantage.

Contact Details:

Interested applicants can apply via email with a covering letter and sent to: kerry.patrick@refieldservices.com. Enclose a full CV and any additional information you may feel is relevant to your application for the post.

RJW Engineering, Worsley

Internal Sales Engineer

Location: Worsley, Manchester

Growing demand from clients has led to internal promotion and the need for an additional Internal Sales Engineer.

Working alongside the Internal Sales Manager and other department heads, duties will include:

- Assist in the quoting and selling of motors and other rotating/control equipment
- Managing motor stock and being responsible for the motor stock check
- Monitoring and managing the feedback following job quotations
- Assisting with the fulfilment of product orders from the website
- Liaising with suppliers to get the best possible terms on motors and other items
- Making suggestions for the introduction of new products

The successful applicant will have significant experience and be able to demonstrate strength in the following areas:

- Sound knowledge of engineering
- Previous sales experience in the engineering sector
- Customer Focus
- Adaptability
- Communication

Knowledge, Skills and Experience Preferred (but not mandatory):

- An engineering qualification from ONC up to degree level in a relevant engineering discipline
- Experience within the motor/rotating equipment sales field
- Evidence of training by original equipment manufacturers
- Experience within a repair environment
- Competence with IT systems including Sage, Word and Excel

The role comes with a very competitive £26,000 pa salary, realistic bonus system, and an OTE of £28,000 pa, together with company pension, 4 weeks holiday + bank holidays.

If you are a resourceful and ambitious Sales Engineer who likes a challenge, and you have the necessary experience mentioned above please apply, we'd like to hear from you.

Contact Details:

Please apply via email with a covering letter sent to: Lee Windsor at lee@rjweng.com. Telephone 0151 207 2074.

New AEMT Members

Full Member:

Industrial Pumps Ltd

E3 Quintec Court, Barbot Hall Industrial Estate, Rotherham, S. Yorks S61 4RN
Tel: 01709 836089
Fax: 01709 837525
Email: sales@industrialpumps.co.uk
Website: www.industrialpumps.co.uk

HME Holt & Martin Ltd

100-102 Gigg Lane, Bury Lancashire BL9 9EW
Tel: 0161 797 7782
Email: info@holtandmartin.com
Website: www.holtandmartin.com
Contact Name: Justine Hopton

International Members:

H. F. Schroeder (W.A.) Ltd

Plot 3, Block D, Apapa-Oshodi Expressway, Amuwo Odofin, Lagos, Nigeria
Tel: 00234 8030520150
Email: mrhfschroeder@gmail.com or dan.schroeder26@yahoo.com
Website: www.hfschroeder.com
Contact Name: Daniel Dawang

(Assistant General Manager)

Branch:

H. F. Schroeder (W.A.) Ltd
Plot 477, Trans-Amadi Industrial Layout, Port Harcourt, Rivers State, Nigeria
Tel: 00234 8067940023
Email: infoph@hfschroeder.com

PT Duta Sarana Engineering

Jln Ngagel Jaya Indah No. 8, (Block B3-5), Surabaya, Indonesia
Tel: 0062 31 5031305
Email: marten.setiawan@dutasaranaeng.com
Website: www.dutasaranaeng.com
Contact Name: Marten Setiawan (Director)

TMTEC Trading & Technical Services LLC

Post Box: 455 Mina Al Fahal, Postal Code: 116, Sultanate of Oman
Tel: 00968 2459 5848
Email: info@tmtecoman.com
Website: www.tmtecoman.com
Contact Name: Gautam Mukherji (General Manager)
Mohammed Haroon (Deputy General Manager)

Turcomp Engineering Services SDN BHD

Lot 1594 & 1595 Jalan By-Pass, Eastwood Valley Industrial 98000 Miri, Sarawak, Malaysia
Tel: 00608 5 417986
Email: yeoh@turcomp.com
Website: www.turcomp.com
Contact Name: Yeoh Cheng Eam

Associate Members:

NTN Bearings UK Ltd

Unit 11 Wellington Crescent, Fradley Park, Lichfield, Staffs WS13 8RZ
Tel: 01543 445000
Email: michael.wooldridge@ntneurope.com
Website: www.ntn-snr.com
Contact Name: Michael Wooldridge (Head of Industrial Aftermarket)

Hazardous Area Member:

Northern Ireland Water

40 Old Westland Road, Belfast, BT14 6TE
Tel: 08457 440088

Email: adrian.atkinson@niwater.com
Website: www.niwater.com
Contact Name: Adrian Atkinson (M & E Area Manager)

Send us your News!

Please remember to keep us informed of your news so that we may publish it in our Bulletins.

Let us help. Even if you have some news to tell us, but nothing written.

admin@aemt.co.uk