MPE
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MPE 90th Anniversary 1925 – 2015

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

MPE PEOPLE

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FAST FACTS ON MPE LTD

- MPE has traded since 1925 and employs over 50 people.
- MPE has designed, manufactured and shipped in excess of 8,000,000 high-performance EMC, EMP and TEMPEST filters and feedthrough capacitors in the last 30 years.
- Many products have been in service for more than 20 years with undiminished performance.
- MPE has a portfolio of over 20,000 custom product designs to meet all possible requirements.
- The MPE factory at Knowsley, Liverpool, is certified to the quality standard ISO 9001:2015, and its products meet all applicable defence standards.

For comprehensive information about MPE's products and services, contact the Sales and Marketing Department, MPE Ltd, Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL, U.K. Tel +44 (0)151 632 9100. Fax +44 (0)151 632 9112.
Email sales@mpe.co.uk. Website www.mpe.co.uk

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MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

David Seabury – Managing Director, MPE Ltd

David Seabury looks back at record 2015 & forward to busier 2016

The 31st of January 2016 saw the end of the 2015 fiscal year for MPE, and it's been an incredibly busy 12 months. Apart from the company celebrating its landmark 90th Anniversary, order intake was at a five-year high, manufacturing output exceeded budget, new export territories were initiated, and additional staff were recruited. All in all, 2015 has been quite some year.

A UK Government agency recently reported that the average lifespan of a UK company is now only 8.6 years: therefore the attainment of our company's 90th Anniversary really was something to celebrate. So June saw 13 of MPE's 15 territory distributors travel to MPE for a two-day celebration . . . we did also do some work! The only absentees were Mikael Klasson from Sweden following a knee operation and our friends at Norshield, who were too busy installing MPE filters to travel to Liverpool. November also saw MPE celebrate with our own staff at the Liner Hotel in Liverpool. Buffet, bar, disco, photobooth, silly games and of course a cake, what more could any self-respecting party need?

For the second year running, MPE not only received significant orders for HEMP filters from both the USA and South Korea, but also witnessed much increased sales of HEMP filters in Europe. Underlying this, sales of MPE's powerline filters grew both in the UK and overseas. Sales were made to territories new to MPE, such as Abu Dhabi, and an increasing number of overseas customers were visited or overseas events attended, with MPE undertaking travel to more than 12 different territories. Perhaps the longest journey was made by Paul Currie, our Sales and Marketing Director, who toured US defense installations in Alaska during August.

New products also came to fruition during 2015, with Radsok connector feedthroughs, a new Ethernet filter, a custom filter for a green energy lighting application and an expanded range of TEMPEST pluggable filters all being rolled out.

Internally at MPE, six more employees came through their NVQ training with flying colours and gained their Level 2 NVQ certificates in Business Improvement Techniques, whilst improvement projects were completed within the capacitor winding, stores and dispatch areas. Mark Meadley in Production received his 25-year service award, and MPE were happy to welcome new team members to expand both the Production and Production Engineering departments. Furthermore Will Turner, our Senior Design Engineer, was selected by the BSI to represent the UK on a key international standards committee.

So, what about 2016? Whilst 2015 has indeed been a busy period for MPE, 2016 promises to be even busier. During February and March MPE already have visits arranged to established territories

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

such as Italy and Korea, with others planned to fresh countries such as Bahrain, Kuwait and Saudi Arabia.

During March MPE are exhibiting for the first time at the leading UK defence procurement event DPRTE in Cardiff and, with EuroEM, MSPO, EMC UK and Electronica coming later in the year, our exhibition and conference activity has certainly increased.

MPE's in-house laboratory is currently under refurbishment and, exiting 2015, our very healthy order pipeline ensures that MPE's manufacturing teams will certainly be challenged over the coming months. I feel sure that some of our increased activity is a result of enhanced confidence and spending in many markets, but I am just as certain that our increased sales are a result of the strategy MPE have put in place and proactively implemented over the last three years.

Finally, looking ahead, during 2016 three of MPE's employees will celebrate their 40th year of service with MPE . . . so, another party anyone?

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

Peter Williams

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Every filter unit that MPE produces passes through Peter's department, with box fabrication and choke winding being integral and critical processes. Box fabrication is one of the first processes undertaken by MPE. All metal cutting, punching, bending and welding are undertaken in-house at MPE and, as reported in Issue 4 of the Company Bulletin, MPE has recently invested in a new Safan E-Brake servo-electronic press to further increase its bending capabilities in terms of capacity, speed and energy efficiency.

Electrically, choke selection is critical to filter performance: however, whilst other elements of electrical manufacture can be automated in some way, choke winding remains a largely manual process. Many different choke types are produced at the same time, and the process, whilst it is manual, is also a highly skilled task, with importance placed upon employees' experience of fulfilling this role.

Immediately prior to his work at MPE, Peter was the Manufacturing and Site Supervisor at mechanical handling company GV&A in Skelmersdale, Lancashire, working on conveyor systems for feed mills. In the 12 years before, he worked in aerospace at BHW Components in Wigan, making parts typically for the European Airbus, Hawker and GKN helicopters. There he progressed from being a sheet metal worker and then chargehand to later become Team Leader and subsequently Project Manager for GKN and Eurofighter parts.

After his apprenticeship Peter Williams had been employed installing ventilation systems for luxury cruise liners at the world-famous Meyer-Werft shipyard, in Papenburg on the River Ems in north-western Germany.

Peter's paper qualifications include a City and Guilds HNC (Higher National Certificate) in Sheet Metal Development achieved at West Derby College, Liverpool, where he was in fact Earl of Derby award winner in 1989. He has been an Associate Member of the Chartered Management Institute for over a year now: he successfully completed their Level Four qualification last year and is progressing in 2015-16 with the Level Five degree course to become a full Chartered Manager.

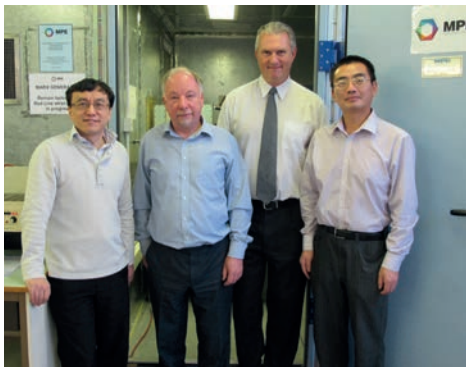
Peter Williams lives at Coppull, near Chorley in Lancashire, with his partner and their two sons, who are currently in studies. For many years he has been a season ticket holder at Everton Football Club as well as a keen golfer. He exercises at the local gym four times a week and was previously involved with local junior football when both of his sons played in the Wigan and District Youth Football League.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8



Pictured from left to right at the formal handover of the Marx pulse generator are Professor Yi Huang, Jan Nalborczyk – Technical Director, MPE Ltd, David Seabury – Managing Director, MPE Ltd and Dr Jiafeng Zhou.

The new Marx pulse generator installed within MPE's in-house screened room test facility

In-house pulse generator to test & optimise new filter designs

In late October 2015 MPE took receipt of a prototype Marx generator, capable of delivering electromagnetic pulses up to 25kV and 2.5kA and with a wave shape representative of that used to test HEMP filters against the pulse current injection (PCI) requirements of MIL-STD-188-125.

The Marx generator was designed and built for MPE in an 18-month collaboration between the company and the Department of Electrical Engineering and Electronics at the University of Liverpool. This collaboration commenced with MPE producing a requirements brief that enabled Professor Yi Huang, Chair of Wireless Engineering in the Department of Electrical Engineering, to initiate research and development into methods of delivering such a generator.

The project was led by Dr Jiafeng Zhou, with much of the practical work being carried out by a small team of specialists. As the development progressed, MPE was closely involved, providing its own procurement contacts and manufacturing experience to ensure that a practical and robust prototype generator could be realised.

The development furthered the understanding of Professor Huang's University team by providing a platform for in-depth analysis of the challenges in producing such high current pulses and in exploring the most appropriate methods to deliver them, within safe and practical conditions of working.

At present the generator is undergoing a thorough commissioning and calibration period at MPE and, going forward, whilst the generator is not intended to replace any testing now conducted by independent test houses, MPE will utilise the unit alongside its current PSpice tools in the development of any new or custom HEMP filter solutions. This will enable MPE to have an even more accurate prediction of filter PCI results prior to submitting units for independent test, which can be a very costly and lengthy process.

Professor Huang remarked: "We are very pleased to have taken this great opportunity to work closely with MPE, allowing us to put our knowledge into practice. The successful production of this new Marx generator is another good example of how we can work effectively and efficiently with industry to benefit both sides."

Jan Nalborczyk, Technical Director of MPE, commented: "Relying solely on computer modelling of filter circuits under pulse conditions is never ideal, due to non-ideal behaviour of filter components. This pulse generator will enable MPE to test and optimise new designs before committing to independent approval testing, which in turn may speed up future developments and provide even more confidence in those filter designs."

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

New EMP/EMI Gigabit Ethernet filter breaks the mould

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In computer networking, GbE is a term describing various technologies for transmitting Ethernet frames at a rate of a gigabit per second (1000 million bits per second), as defined by the IEEE 802.3 Standard 2008.

For use on 10/100/1000BASE-T twisted pair cabling of Cat-5, Cat-5e and Cat-6 up to 100 metres long, the new MPE filter incorporates an ultra-low capacitive surge arrestor with fast response time. There are eight lines in total, comprising four differential pairs.

Unique technical features include matched common-mode chokes for rejection of differential noise, thereby improving signal symmetry. The EMP/EMI Ethernet filter is easily and conveniently bulkhead mounted on – for example – enclosures and EMC chamber doors, with connection via standard RJ45 sockets.

Comprehensive electrical, pulse and surge arrestor, mechanical and environmental specifications for MPE's new EMP/EMI Ethernet filter are included with engineering drawings in the datasheet which you can download from here

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

Norshield presented with MPE's Top Distributor Award

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The Award was made in recognition of the continued year-on-year success of Norshield over the past decade in selling MPE installation filters.

A company owned by the three Directors Torstein Hernes, Roy Sørum and Jan Klemmetvoll, Norshield are based some five hours' drive north of Oslo at Os i Østerdalen. They have specialised in providing EMC/EMI protection solutions for over 20 years and are the market leaders in this field in Norway for applications such as command, control and communications infrastructure, shielded rooms, EMC chambers and EMC cabinets.

Annually Norshield's business is split evenly between their work for Norwegian and NATO defence and their commercial projects in sectors such as power and renewable energy. The Norshield team is currently five strong, with a plan to increase this to six in early 2016, although subcontractors are brought in by Norshield as and when projects necessitate.

The relationship with MPE goes back to the very early days following Norshield's foundation in 1993. Products supplied span many models of powerline and CleanPower filters, along with signal and telephone filters for both fixed and mobile applications.

www.norshield.no

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

The KIEES Committee pictured during the event: Vice-Chairman Mr Jun Sun Park is shown on the back row, third from the left.

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The focus for this year's event was the emerging IEMI threat and the effective measurement of this threat. Presentations were conducted throughout the day in the conference hall, with speakers from both the Korean and European EMP communities. Outside the hall a small, select group of companies were invited to display their innovative EMP solutions, including MPE's Korean distributor Eretec, Inc with its MIL-STD-188-125 compliant products.

Mr Jun Sun Park, the President of Eretec, Inc, is also the current Vice-Chairman of the KIEES organisation and has a particular focus on further improving the links between the academic and commercial EMP communities, ensuring that cutting-edge technologies are adopted quickly and made more accessible to end-users.

At the event, Eretec, Inc displayed a range of MPE HEMP filters along with its own proprietary shielding solutions. The MPE HEMP filters on display have now been supplied to the Korean market for over five years, with many hundreds of units successfully installed. Installed filters include powerline ranges from 6A through to 800A along with numerous signal, data and telephone line filters.

Whilst other work commitments did not allow MPE representatives to fly out to the EMSEC 2015 event, Will Turner, the Senior Design Engineer of MPE, had presented an IEMI detection paper earlier in October at the EMC UK 2015 event in Newbury. This paper was on the same IEMI threat theme discussed at EMSEC, whilst also explaining the advantages of having access to standalone IEMI detectors as a cost-effective way of determining risk factors and facilitating the appropriate mitigation steps. Will Turner's complete paper may be downloaded here in PDF format.

In February 2016, MPE is one of 12 companies taking part in a trade mission to Seoul organised by the UK Trade and Industry organisation. Along with individual customer meetings to be held by each of the companies attending, there will also be market briefings and a reception hosted by the UK Embassy in Seoul.

www.eretec.com
www.kiees.or.kr/english/

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Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

HMS Queen Elizabeth at Rosyth dockyard

MPE powerline filters

MPE filter solutions for Queen Elizabeth class aircraft carriers

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Each vessel has a displacement of some 70,600 tonnes, is 280 metres long and is designed to have a tailored air group of up to forty aircraft. These will be the largest warships ever constructed for the Royal Navy. Both vessels' design consist of nine decks beneath the flight deck, incorporating a hangar covering the centrepiece of two decks (without islands). In terms of accommodation, each vessel has the capability to house 679 crew, not including the air element with total berths for up to 1,600 personnel.

McGeoch Technology Ltd (www.mcgeoch.co.uk) recently completed approximately £7 million worth of contracts, ranging from all lighting within the vessels (24,000 light fittings), distribution panels, control and instrumentation panels, and junction boxes. The vessel's design also demanded that EMC filter units were installed to filter the power supplies entering Black leakage path equipment within onboard TEMPEST compartments.

Accordingly McGeoch selected MPE as their preferred solutions provider based upon a solid working relationship on previous projects. Close collaboration ensured that fully proven designs and products were delivered on time and to budget to the aircraft carrier project teams.

In total, MPE has supplied 66 filters for the Queen Elizabeth class, comprising ten different designs of filter. These filters have ranged from 6A through to 63A and included both single-phase and three-phase variants from MPE's standard and low-leakage performance ranges. Each filter has also been mechanically customised with a bespoke earth stud design to suit the application.

It is anticipated that there will be future requirements for spares, support and further follow-on requirements, so continuing the strong working relationship between MPE and McGeoch.

For further information on MPE's high-performance powerline filters, visit www.mpe.co.uk/category/installation-filters/ or to download a product overview brochure click here.

MPE
Quality, Reliability, Performance

Company Bulletin

for EMC, EMP & TEMPEST Protection

Issue 8

EMP & TEMPEST protection for Norway

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Whilst the vast majority of applications are confidential and so cannot be specifically named, the most common applications have been shielded chambers and shielded cabinets to service fixed installations within defence applications as well as for power and utility customers. Amongst these customers, the common theme has been the requirement for high performance either to demanding military standards or for the achievement of high insertion losses across the full frequency spectrum.

An interesting example of such an application is a recent project in which Norshield have been delivering a high-performance solution to a customer within the commercial sector. The requirement saw the need for the filter to have a high level of attenuation in the EMP and TEMPEST range, whilst mechanically having project-specific paint requirements and all being contained within a minimum space envelope.

MPE therefore developed and delivered a custom filter for Norshield which was derived from the well-established DS41016 16A CleanPower filter.

Electrically the filter developed was customised to provide a higher level of attenuation, whilst mechanically the filter was designed to accommodate the additional electrical componentry to achieve this high attenuation within a similar footprint as the DS41016. Within the iterative design process and dialogue with the customer, the filter was then further customised with a bespoke earth stud – resulting in a significant saving in installation time on site – and painted in accordance with an application-specific requirement.

Pictured is the DS41016 16A CleanPower filter from which the custom filter was derived.

For further information on the MPE CleanPower filter range – single-phase and three-phase at current ratings of 16A, 32A and 63A – you can download the current page from the MPE website www.mpe.co.uk/products/clean-power-filters/