**Surface Profile Measurement**

The Surface Profile Probe, part of Fischer’s materials testing range, measures blasted surfaces, enabling the user to prepare the substrate, select the cleaning method and apply the right amount of coating.

The probe is interchangeable with Fischer’s coating thickness probes and used with the FMP series of measurement handhelds to provide quick and repeatable measurements.

For coating thickness and surface profile precision and accuracy on tough jobs, turn to a Fischer instrument.

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www.fischerjgb.co.uk
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The President Writes

I had the pleasure of attending the North East Branch summer event in Durham recently, it was well attended by members old and new. We had a tour of the Castle followed by an excellent presentation from Professor Jon Gluyas entitled “Energy past, present and future”. It was a thoroughly interesting evening enjoyed by all.

This month has been a busy one, I was invited to join the BCF meeting on behalf of ICORR, where it was great to see so many ICORR members round the table.

We have also launched the re-vamped website this month, which has been a great effort by many behind the scenes, and I do hope that you will see the benefit. One of the big changes is that new members are able to sign up directly on the website, and moving on, this reminds me that you should have all received your renewal letter and I hope you have found time to renew your subscriptions, which from next year is also something that will be available to members, who would prefer to do this online.

As some of you will recall we have now organised two programmes of educational training courses aimed at Young Engineers, which involve a series of lectures and a group case study, the conclusions of which are then presented to an audience of their peers and judged by a panel of industry experts. The winners from the last programme won the prize of attending the NACE conference in Vancouver. We are planning to run this event again, so if you are interested in being a candidate, or would like to nominate a candidate, please let me know.

I would finally like to highlight an upcoming event being held by the Aberdeen Branch, the ICorr Corrosion Awareness Training Day on the 29th August. This is an annual event and always well worth attending.

Sarah Vasey, ICorr President

From the Editor

Welcome to the summer issue of the magazine, and the anniversary of my taking over the role of editor. It has been an interesting year working with Square One, and colleagues in the industry, to re-vamp the magazine which I hope you feel is of benefit. Some further improvements are planned for the next year.

This month we again have three technical articles, online corrosion monitoring in refineries, a look at corrosion protection of aging assets, and a very interesting article on the subject of applying Lean Manufacturing Processes to corrosion protection activities to improve efficiency and the effectiveness of them.

Remember if you have any comments or suggestions on your magazine, or would like to submit a technical article, please send to me via the Northampton office

Brian Goldie, Consulting Editor

ICATS News

ISO 9001

Correx is pleased to announce that it has achieved certification to ISO 9001: 2015 for its Quality Management Systems. LRQA was engaged to carry out this certification and audited the company in May 2017.

The scope of the Correx Quality Management System is the Management of the Industrial Coatings Applicator Training Scheme, in addition to enhancing the operation of the scheme it is also a requirement of Highways England that schemes approved for the Training and Certification of Personnel Engaged in Industrial Coatings Application for National Highway Sector Scheme 19A (NHSS 19A) are approved to ISO 9001.

ICATS Reg Doc

The Institute of Corrosion document which defines the requirements for the operation of the ICATS scheme is called the Req Doc and the latest version (the 15th Edition since the scheme was introduced in 2005) has just been approved.

The major changes in the latest version are as follows:

- Mentoring – the maximum number of Trainee Applicators one qualified ICATS Applicator can mentor is 5
- Trainee Cards will only be valid for one year
- Trainers applying for renewal must be working for an ICATS registered company and have trained within the last three years
- Conditions for out of date renewals have been revised

Supervisor Course

There are three presentations of the new revised ICATS Supervisor Course in August these will be 1st and 2nd, 8th and 9th and 15th and 16th in Devon. There will be a further course in Northampton on 7th and 8th September. The application form can be downloaded from the ICATS website under the Supervisors Module tab, or obtained by calling the Correx office on 01804 438222.

ICATS Company Trainer Course

The next ICATS Company Trainer Course will be held on 5th and 6th September in Northampton.

SMART Cards

Following ICATS becoming part of the CSCS Partnership, they will shortly be introducing SMART cards which will contain a chip storing information on the cardholder’s identity and ICATS registration. Site managers will be able to read this information using a smartphone, tablet or PC, allowing them to instantly record the cardholder’s information, and be confident of the holder’s ICATS qualification(s).

Keep up to date with ICATS using the website or through the ICATS group on LinkedIn.
Professional Development & Training Committee (PDTC) News

There are some exciting developments in the world of training coming up. The "fundamentals of corrosion" course that fills the gap for people wishing to upgrade to professional membership, but lacking in formal corrosion training, is now in place. In addition ISO 15257 has been published, which means the current BS EN 15257 will become BS EN ISO 15257. It just needs translating from ISO standard languages (English and French) to the European standard languages (English, French and German). This standard extends the reach of the Cathodic Protection (CP) training and certification scheme, and incorporates the existing NACE CP scheme. As a result the certification paperwork and training courses need a little tweaking (the ISO has 5 levels and the BS EN currently only has 3). Levels 1 to 3 in the current CP schemes correspond to levels 2 to 4 in the ISO scheme. PDTC are working on a rapid implementation of the ISO standard to limit the confusion. As soon as this is done it is planned to offer a trade-up option where people with existing CP cards can have a fresh card with the ISO level stated on it. The CP certification means that clients can be sure that people designing testing and installing cathodic protection schemes have the correct paperwork to demonstrate competence in the correct area, not just a generic CP qualification. It also means that those installing CP systems can demonstrate to clients they have the right skills for the job, and justify why they should be included on CP tenders. It also means they have the best chance of not having to repeat work and revisit sites to rectify problems caused by using unskilled, uncertificated people.

The new Senior Cathodic Protection Technician Level 2 Marine Metallic structures Course was run successfully on 8th – 12 May at Poole Museum and RNLI College jetty.

The course, written and presented by David Harvey CEng, FICorr, covered the application of cathodic protection to harbours and jetties, offshore structures, subsea structures and pipelines. Date and venue for the next course is yet to be set.

The National Highway Sector Scheme 19A is pushing to get apprentice schemes set up that are based on the ICATS scheme. This enables companies to draw down on monies that have been taken as a levy, and placed in a government training bank. Once this has been sorted out for the ICATS scheme, the possibility of extending it to cover other training options, will be considered. It’s not a straightforward process, but it’s a goal for ICorr. As part of the apprenticeship schemes ICorr are looking at becoming registered with OfQual, to give our training schemes and qualifications a more widespread status.

If anyone has any training needs, concerns or worries, feel free to email admin@icorr.org, and a member of PTDC will respond to them.

Visit the ICATS website www.icats-training.org

NEW SUSTAINING MEMBERS

Sustaining Company Membership is rapidly increasing in popularity. Apart from the prestige value and increased exposure that a company or organisation receives from this form of membership, it also offers increased marketing opportunities. There are two grades, Sustaining Membership and Gold Sustaining Membership. Your company will join a growing number of influential companies and organisations who see Sustaining Membership of the Institute as a valuable business tool, as well as an opportunity to express support for the premier Corrosion Institute.

The other advantages include:

- Listing in the on-line directory and in Corrosion Management Magazine
- Nomination of two staff as ordinary representatives of the Institute who would not necessarily qualify for Professional
- Free use of ICorr logo on your company literature and advertising, and ICorr crested Certificate of Company membership for public display at your premises
- Reduced rates on advertising in Corrosion Management
- Company membership is £386.00 plus VAT, and for Gold Sustaining Members, £747.00 + VAT, which gives the additional benefits of nomination of three staff as ordinary representatives of the Institute, Gold Sustaining Member Icon on listing on our Website, and Gold Sustaining Member badge on magazine listing

If your company is interested in becoming a sustaining member, please contact head office at info@icorr.org. The following four companies are now sustaining members of the Institute.

NEW SUSTAINING MEMBER
PRESSERV LTD

Presserv Ltd based in Aberdeen UK are part of the Presserv Group, headquartered in Stavanger. They specialise in equipment preservation and protection of assets and equipment in storage and lay-up. They are also the Scottish and UK oil & gas distributor and applicators for STOPOAQ visco-elastic membrane which has been used on minimally prepared structural steelwork and pipework to give 30+ years protection. They are also the Scottish distributors for Sponge Jet blasting equipment.

NEW SUSTAINING MEMBER
CATHODIC PROTECTION ENGINEERING LTD (CPEL)

CPEL, based in Wythall, Birmingham, offers the following specialist services

- Complex Cathodic Protection Engineering Services
- Detailed fault finding CP surveys
- CP and Corrosion Consultancy
- CP Installation Services
- CP Material Supply
- Specialised CP Surveys (CIPS, DCVG, PCM)
- Routine CP Monitoring Services
- AC Mitigation Consultancy
- CP / AC Datalogging Surveys
- All staff either NACE and/or ICORR certified
MAPEI
A family business with 80 years’ experience, Mapei is the one of the world’s leading manufacturers of adhesives, sealants and chemical products for the building industry, including products for the installation of cathodic protection, protective coatings, waterproofing systems, all types of wall and floor coverings and a vast range of admixtures and repair products for concrete. They also offer a free expert specification service and work closely with builders, developers, engineers, architects and contractors worldwide providing tailored advice, along with current technical assistance. Mapei adopts independently certified quality, environmental and health and safety management systems in compliance with international standards ISO 9001, ISO 14001 and OHSAS 18001.

Mapei UK Ltd, based in the West Midlands, opened their state-of-the-art manufacturing facility in 2004, the 47th manufacturing plant worldwide. The facility accommodates manufacturing, stock, marketing, sales and technical services and is home to on-site training facilities.

HCL
HCL is a UK based family owned business providing cost effective, non-metallic and innovative solutions for the subsea, cathodic protection and anti-corrosion industries. It is one of the world leaders in high strength, non-metallic polymer banding technologies for the Oil & Gas and associated industries, and manufactures what is reportedly the strongest polymer cable tie in the world.

HCL specialise in in the long term, secure clamping of subsea applications such as risers, VIV strakes, pipeline piggy back and cold applied tape wrap jacketed corrosion protection systems, the latest additions to the HCL range of technologies include the ability to mount sacrificial anodes without welding or metal hoop clamps that can facilitate reduced site visits and lower diver costs with less time required for fitting. They can provide the complete package for non-ferrous mounting of corrosion protection of marine assets.

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Visit the ICorr website
for all the latest news
www.icorr.org

CEOCOR Congress 2018: Stratford on Avon 15 – 18 May 2018
The 2018 CEOCOR congress, covering buried pipeline corrosion (internal and external), in the oil, gas, waste and potable water industries, is being organised by the Institute of Corrosion and Correx Ltd. It is anticipated that there will be a high level of technical attendees (100+) from all over Europe and beyond. In addition to the technical conference there will be a specialist exhibition demonstrating products and skills to the senior specifiers attending. There is a maximum of 26 exhibitors and sponsors, and already there have been 9 confirmed bookings and 11 expressions of interests or verbal commitments. If your company wishes to exhibit or sponsor, visit www.ceocor2018.com, for more information.

BRANCH NEWS
Aberdeen Branch
The final evening event of 2017 was held on Tuesday the 30th May, with 50 attendees representing a wide range of sponsors and also many visiting guests. The Branch was once again honoured to have the presence of ICorr President Sarah Vasey, who provided a welcome update on HQ Plans and thanked the Branch Committee for all its efforts over a very successful 2016-2017 Session.

A technical paper entitled “A Review of State of the Art in Corrosion under Insulation Testing (CUI)” was presented by Simon Daly, Group Oil & Gas Segment Manager of Hempel A/S, who explained the company’s long involvement with CUI R&D, via its association with the Danish Technical University in Copenhagen.

Billions of dollars are spent worldwide due to CUI issues, and as there are many operating variables, failure risks and repair costs associated with undetected CUI, any attempt to lessons these can only be to the industry’s advantage.

Frequently the weak areas are field joints with field repairs of piping and coating systems difficult to equal in quality to the factory coating systems that are applied under controlled conditions. Similarly external cladding may not be of consistent quality in terms of weather proofing and sealing abilities.

It is not often realized that coatings hidden under insulation must have multiple and simultaneous performance properties and must be resistant in service to, immersion conditions (saturated insulation), thermal cycling (equipment in intermittent use) and varying levels of surface preparation.

Commonly used test methods were reviewed by Simon, along with the benefits and drawbacks of each system. In addition, suggestions were offered for a pre-qualification system which not only takes into account the CUI test itself but also test methods to qualify some of the considerations shown above, as well as likely inclusions in the new ISO standard 19277 ‘Petroleum, petrochemical and natural gas industries - Qualification testing and acceptance criteria for protective coating systems under insulation’, currently under development for CUI protection.

There were many questions from the very attentive audience on a wide range of topics, including future ISO tests on coatings for CRA’s, blasting methods, maintenance painting, life cycle / life extension considerations and use of TSA coatings.
The well supported evening closed with a handover of the Chair to Dr. Yunnan Gao, this year’s Events Coordinator, by the current Chair Stephen Tate.

The Branch has one more event before the new session starts, the Annual Corrosion Awareness Day on 29 August at the usual venue, the Palm Court Hotel, which this year is kindly sponsored by Sherwin-Williams.

This course is aimed at graduate engineers, non-corrosion engineers and others working closely with corrosion, (e.g. integrity engineers, inspection engineers, etc.). The full-day course, will comprise a number of lectures covering different aspects of corrosion, providing basic information on corrosion principles and mechanisms of corrosion control, including:

- Introduction to Corrosion and its costs, plus corrosion mechanisms and everyday examples, Professor Paul Lambert (Mott MacDonald)
- Mitigation by coatings and materials selection, and corrosion mitigation by chemicals, Malcolm Morris (Sherwin Williams)
- Corrosion mitigation by cathodic protection (sacrificial and impressed current), Nigel Owen (Aberdeen Foundries)
- Corrosion monitoring and microbiology – analysis and data trending, Dr Carol Devine, North East Corrosion Engineers Ltd
- Corrosion management overview and risk based inspection, Hooman Takhtechian (Oceaneering)
- Corrosion rate modelling, Dr Muhammad Ejaz, Plant Integrity Management Ltd.

The decision of this course is to improve understanding of corrosion processes and to raise awareness of corrosion management. The course is hosted by ICorr Aberdeen through kind assistance of its local / national sponsors. As spaces are strictly limited, they will be allocated on a first-come first-served basis. For registration or further information please contact admin@icorr.org

For information about all forthcoming Aberdeen branch activities, please contact the new session chair, Dr Yunnan Gao, ICorrABZ@gmail.com. A calendar of local events of interest to corrosion professionals in the Aberdeen area, and the opportunity to sign up to the branch mailing list, is available at https://sites.google.com/site/icorrabz/home

Aberdeen Branch have also established a new Media Centre, which can be found at ICorrABZ@gmail.com

London Branch

The first meeting of the new season is a joint meeting with LMS on 12 October, and the evening has been handed over to the Young ICorr Group, who have organised a presentation by Simon Bowcock of BP on “Corrosion challenges and considerations for the design and installation of 316 stainless steel-clad subsea flowlines”.

The meeting will be held at the usual venue, Imperial College, Skempton Building, London, with the presentation at 18.30, followed by refreshments and networking between 19.30 and 21.00.

For further information please contact icorr@london@gmail.com or george.winning@clarient.com.

On 19 October there is a meeting, organised by the Society of Chemical Industry’s London group, and the Branch entitled “From the Foundations of Electricity to Modern Corrosion Failures” – see diary page, and advert on page 11.

This free evening event includes two presentations, the first on the historical background of electricity, by Dr F Parrett, and the second on the recent problems of AC Corrosion on pipelines, by Dr David Eyre.

Planning is well underway for the forthcoming 29th Annual Christmas Luncheon which will be held on the 7th December in London at the normal venue, the Royal Overseas League. Formal advertising and the ability to book tables will take place later in the year. At this time the London Branch – Luncheon Subcommittee would like to offer companies the opportunity of supporting the event in terms of contributing to the cost of the entertainment and the raffle prizes. All companies who contribute to the cost of the entertainment will receive visual publicity on the day for the duration of the event. If you would like to support this event by providing sponsorship, please email ICorr head office (admin@icorr.org) indicating the amount, and they will email you an invoice if you respond by 31st August.

Midland Branch

The Midland Branch welcomed two new sustaining members, Mapei Ltd based in Halesowen, West Midlands, and Cathodic Protection Engineering based in Wythall, Birmingham.

The last Midland Branch meeting took place on 27 June at Amey’s office in Birmingham. As well as updates on Branch and ICorr news; discussions were held regarding future branch meetings and presentations. Peter McCloskey, of Vector Corrosion Technologies then gave two presentations, “Cable impregnation techniques for protection of grouted post tensioned tendons” and “Introduction to Termarust corrosion mitigation system for steel structures”.

Both presentations were well received and a detailed Q&A session ensued. The Branch would like to thank Amey, Birmingham, for providing the venue.

Peter McCloskey
North East Branch

The Branch had their summer event at Hatfield College Durham on 6 July, including a very interesting tour of Durham Castle with a wee bit of a history lesson! Durham Castle is the ancient palace of the Prince Bishops of Durham. It was built on the order of William the Conqueror on his return from Scotland in 1072 as a projection of the Norman kings power in the North of England. Strangely enough he thought we were a bit ‘wild’, no change there then! The tour took us around the two chapels, the Norman chapel built in 1078 & Tunstall’s chapel built in 1540 exclusively for the Prince Bishop. The last wish of the Prince Bishop in 1837 was to leave the castle and all surrounding land to form the University, which at the time was heavily challenged by London and the government, but they thankfully lost. To this date it is still owned as used by Durham University and quite frankly is impressive. It is a fully functional home to students who use the grand ballroom for breakfast and dinner, and the upper floors are now student accommodation for the lucky ones.

The second part of the evening was taken up by a very informative and interesting look at “UK Energy Past, Present and Future” presented by Prof Jon Gluyas, who is currently Dean of Knowledge Exchange and Director of Energy Institute Durham University. The presentation covered the issues of the ENERGY TRILEMA which within the UK is seen as relating to Equity/Sustainability/Security. The origins of the petroleum age were described with three important landmark discoveries, Bibi – Aybat Caspian 1846, Spindletop – Texas 1901, and Masjed e Suleyman – Iran 1908. The use of Mineral Oil really took off in the 1860’s and led to reduction in use of Whale Oil therefore resulting in the reduction of whale Hunting! One of the most frightening statistics was that there have been no large Oil discoveries for over 50 years which has resulted in a decline in global reserves. The audience was taken through the issues of declining oil and gas prices and the resultant increase in consumption which again is putting major stresses on reserves. The increase in USA on Shale Gas is having little effect on the reserves which were steady from the 80’s but the gap is narrowing.

The presentation then turned to the situation in the UK showing the trend in energy production and consumption and again a widening energy gap was described through which we as a nation need to address from within the UK. Recent headlines show what is happening to our energy base, the last three deep coal mines are to close resulting in increased imports of coal for the remaining coal fired power stations, Ferrybridge power station to close, and oil & gas platform decommissioning accelerating in some cases 10 years early.

In the 1980’s the UK was self-sufficient in coal/gas/oil, but today is increasing our import of these. Most of our gas consumption is imported from Norway and Qatar, which is a real issue at the moment and we are talking about increasing imports. Most of Europe’s gas is controlled by Russia! Currently UK has 14 days of gas reserves whereas France & Germany have 100 days.

Finally the UK is cancelling many green energy policies making renewables more expensive as currently gas and oil are low in price. UK is considering following US lead and drawing upon fracking as an energy source as well as increasing reliance on nuclear. In summary these are interesting times in the energy industry and the UK needs to find ways of improving its self-sufficiency. One potential source is Geothermal which is estimated to be around 100 years worth of low carbon heating here in the UK, with potential centres in Cheshire, East Yorkshire and Wessex, to name a few. Utilisation of this technology could cut UK emissions by up to 38%.

Members and guests, including one potential new member!
Institute News

**North West Branch**

After a year’s hiatus the North West Branch held a lively Golf Day followed by the AGM. The meeting was well attended and the incoming Chairman is Andy Bradley of Omniflex, a manufacturer of specialist monitoring and control systems including cathodic protection power supplies for reinforced concrete.

At the meeting several options for the forthcoming year were discussed, including the Christmas meal, golf day and AGM, together with an initial couple of technical events. On the 4th of September, Chris Atkins will be outlining the new international standard on cathodic protection training and certification at an evening meeting. This is an important document that extends the remit of the current BS EN 15257 to draw in NACE influenced areas. There are a number of changes that need to be highlighted, along with the Institute of Corrosion’s programme for rolling the new scheme out.

On 4 October the Branch will be supporting Salford University in the one day ‘hackathon’ on Lean Construction. Lean is all about removing waste, be it physical waste, or wasted time, energy and effort in processes (see technical article later in this issue). Salford hope to bring together key people who represent the processes involved in corrosion protection of structures with Highways England. The outcome of the day is aimed at producing a research package, or series of packages, that they can obtain funding for and develop something that is not only academically interesting, but of practical added value to the industry.

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**Obituary: Dr Chris Smith, FIMMM, FICorr, CEng (1944-2017)**

Chris Smith was born in Northampton and attended Birmingham University’s School of Metallurgy, graduating in 1965, and decided to stay on to study for his doctorate. At that time there was considerable interest in how to control the properties of steel used for construction of car bodies, and during his PhD Chris pioneered the routine use of electron microscopy to understand the microstructural mechanisms involved in the deformation and annealing of sheet steel. For the rest of his career Chris always retained an interest in applying analytical electron microscopy to solve practical problems.

After the completion of his studies at Birmingham, Chris had a spell at the Atomic Weapons Research Establishment and the Ministry of Defence Materials Research Policy Unit in London, before joining the Corrosion Section of the then Royal Aircraft Establishment (RAE) and the family moved to Hook in Hampshire. Chris became Head of the Corrosion Section in 1984 and over the subsequent years he built a number of research relationships with UK Universities to develop alternatives to the toxic cadmium and chromate materials and coatings then used in airframe protection, overseeing pioneering work on zinc-nickel electroplating, magnetron sputtered coatings, anodising and the use of molybdate and rare-earth corrosion inhibitor treatments for aluminium alloys. Chris collaborated extensively with George Thompson and Graham Wood in the Corrosion and Protection Centre at the then University of Manchester Institute of Science and Technology (UMIST, now the University of Manchester) on the surface finishing of aluminium aircraft alloys where his favourite technique, electron microscopy, was used to great effect in elucidating critical mechanisms. Chris was indeed a great friend to UMIST and became an active and valued member of the External Advisory Committee for the MSc programme on Corrosion Control Engineering, lecturing on the corrosion masters programmes there and also at Surrey University. He also had active collaborations with Loughborough University and Cranfield University, and elsewhere, and his valued expertise was called on in a number of occasions as external PhD examiner.

Chris was involved with the corrosion activities of international bodies such as the Group for Aeronautical Research and Technology in Europe (GARTEUR), and the Advisory Group on Aerospace Research and Development (AGARD). This led to collaboration with teams in several major aerospace companies and a regular cycle of aerospace corrosion control conferences and technical visits in Europe and further abroad, cementing Chris’s position in his chosen field. This was achieved while also providing specific corrosion related advice on the RAE’s VC10, Nimrod, Hercules, Tornado and Jaguar aircraft at various times and mentoring the early careers of his new team members, as the RAE successively became part of the Defence Research Agency and eventually the private sector defence technology company QinetiQ. The latter years of Chris’s career saw the Corrosion Section increasingly focussing on projects for the replacement of cadmium and chromate with the participation of companies in the entire aerospace supply chain. During this period Chris attained his personal career target of publishing over 100 peer-reviewed papers and was appointed a company Fellow of both DERA and QinetiQ. He also served for many years as a Referee, Contributor and Member of the Editorial Advisory Board of the Anti-Corrosion Methods and Materials Journal. Even after his well-deserved retirement Chris continued to be active, contributing to the 2010 revision of “Shrier’s Corrosion” and starting an Open University degree in Mathematics which, unfortunately, he was only 30 credits from completing when he died.

Chris was a very kind and gentle person, which made him a fantastic mentor, particularly for early career researchers, colleagues and especially the PhD students whom he funded and helped guide through their studies. Amongst the corrosion community he was widely known and immensely well-respected. He will be greatly missed. Chris is survived by his wife Coral, children, Keith, Neil, Helen and seven grandchildren. A longer version of this obituary can be found on the website.

© Stuart Lyon (Corrosion and Protection Centre, School of Materials, University of Manchester), Robin Oakley (Team Leader for Metals, Corrosion and NDE, QinetiQ) and acknowledging contributions from Bill Cox, Vic MacLoughlin and Coral Smith.
Hempel protects iconic Queensferry Crossing

Hempel has provided the corrosion protection coating solutions for the Queensferry Crossing. Located on the busy Forth Estuary near Edinburgh, it has a 2.7 kilometre span making it the longest three-tower cable-stayed bridge in the world.

The steelwork for the main sections of the bridge were manufactured in China and assembled in Scotland, and smaller steel structures were manufactured in UK. As the steel would be transported to Scotland by sea, it was important that the coating solution chosen would be tough enough to withstand the impacts and exposure during the 7,700-kilometre journey, and robust enough to protect the bridge from the harsh Scottish climate and coastal conditions for years to come.

According to steel manufacturer, Shanghai Zhenhua Heavy Industry Co., Ltd. (ZPMC), they selected Hempel’s range of high performance anti-corrosion systems due to their extensive track record of protecting infrastructure, including four of the world’s ten largest cable-stayed bridges.

Over 600,000 litres of Hempel coatings have been supplied to protect the 35,000 tons of steel. For the exterior, products included Hempadur Zinc 17360 zinc rich epoxy, Hempadur MIO 47050 epoxy MIO, and Hempathane HS 5700 inorganic zinc silicate was used at the connection joints to provide the necessary coefficient of friction (slip resistance).

The Queensferry Crossing will open to traffic on August 30, 2017.

AkzoNobel makes double acquisition

AkzoNobel has announced the acquisition of UK-based Flexcrete Technologies Ltd and an agreement to acquire French manufacturer Disa Technology (Disatech). According to the company, the deals will further strengthen its global leadership position in supplying innovative industrial coatings and aerospace and automotive coatings.

Flexcrete Technologies manufactures products primarily used for the protection and repair of concrete substrates, whereas Disatech supplies innovative adhesive films used in the aerospace, transportation and industrial equipment sectors. The signed agreement between AkzoNobel and Disatech is subject to regulatory approvals.

London workshop on Corrosion

The Royal Society of Chemistry is piloting a new innovation on corrosion. On Monday 18 September they will be holding a multidisciplinary workshop to explore four corrosion challenges identified by their industry partners AkzoNobel, Aramco, BASF and BP. If anyone has the expertise to help tackle the challenges in localised corrosion, predicting and monitoring corrosion, and corrosion in non-metals, the RSC want to hear from them.

They are looking for representatives from academia and industry, all disciplines – from chemical scientists to biologists and all sectors - from oil and gas to water.

To take part in this initiative, and for more information contact, industry@rsc.org

Atkins now under Canadian ownership

Canada’s SNC-Lavalin has completed its acquisition of British consulting engineer WS Atkins. Heath Drewett, previously group finance director of Atkins since 2009, now becomes president of Atkins, SNC-Lavalin’s fifth business sector, and a member of SNC-Lavalin’s executive committee. He reports directly to SNC-Lavalin president and chief executive Neil Bruce.

With the addition of Atkins’ 18,000 employees around the world, SNC-Lavalin now has more than 50,000 employees and annual revenues of approximately £7.2bn. According to Neil Bruce, combining the two highly complementary businesses, solidifies SNC-Lavalin’s position as one of the largest fully integrated professional services firms in the world, while improving margins and balancing the business portfolio.

Three leading consulting engineers form alliance to promote collaborative working

According to Balfour Beatty, they have set up what they call a UK Strategic Design Consultant Partnership with WS Atkins (now part of SNC-Lavalin, as reported above), Mott MacDonald and WSP. The operation will be led by Balfour Beatty’s newly-appointed Strategic Design Consultant Partnership director, Robin Bashford, who moves across from the Major Projects business. Balfour Beatty has already worked with all three companies over the years but now they will have standard terms and conditions. The partnership will bring designers and engineers from the four companies together to find solutions in key areas such as health and safety through design, value engineering, and the use of more cost-effective design resources, concluded Balfour Beatty.
Halve your DFT inspection times using the Elcometer 456 Coating Thickness Gauge with the Ultra/Scan Probe.

elcometer.com

LONDON BRANCH EVENT

Thurs 19 October 2017, 17:30 for 18:00
From the Foundations of Electricity to Modern Corrosion Failures
Organised by SCI’s London Group and the Institute of Corrosion

SCI, 14/15 Belgrave Square, London, SW1X 8PS

1750 - Benjamin Franklin’s Electricity Experiments: Dr Fred Parrett, SCI London Group Chair & Parrett Technical Developments
Before the first batteries were invented and we could experiment with direct current, early experiments were all with static electricity. The most significant and well documented were those by Benjamin Franklin around 1750. Well known for his kite experiment with lightning, but he did so much more. This presentation will outline the Science of Benjamin Franklin and link to his life not just in the USA but the 18 years he spent living in London.

2017 - AC Corrosion on Pipelines - a serious hidden problem: Dr David Eyre, independent consultant
Corrosion is controlled on high pressure oil and gas pipelines by application of a high quality coating system, supplemented by cathodic protection (CP). AC Corrosion is a recently identified form of corrosion that can cause rapid full-wall penetration on coated pipelines by induced AC current, even with a fully functioning CP system. This can occur when the buried pipeline parallels overhead HV powerlines. This talk will describe how the AC is generated onto the pipeline, the corrosion mechanism and how the risk can be assessed and mitigated.

The event is free to attend, but please register in advance via http://bit.ly/LG191017 to avoid disappointment.
The event is open to SCI, ICorr, IOM3, LMS and TWI members and guests.
Inspection Instruments for the Pipeline Coating Industry

The first of three volumes, this free eBook provides information on the proper use of test instruments and kits for verifying the quality of surface preparation of new pipe in the shop, girth weld areas, existing pipe in the field, and structural steel in general, prior to the application of protective coatings. Verifying the quality of coating application both during and post-application will be the subject of Volumes 2 and 3, respectively.

It is written by William D. Corbett, the Chief Operations Officer for KTA-Tator Inc. (KTA), where he has been employed for 38 years. He holds an AD in Business Administration from Robert Morris University. He is an SSPC Certified Protective Coating Specialist, an SSPC Level 3 Certified Protective Coatings Inspector, an SSPC Level 2 Certified Bridge Coatings Inspector, as well as a NACE Level 3 Certified Coatings Inspector.

The eBook comes as an Online Version with no download required, and a downloadable PDF Version, and can be obtained at www.ktauniversity.com

BOOK REVIEWS


CRC Press, ISBN 9781498760720

This book provides a very useful and comprehensive reference resource for all those working in the field of corrosion protection coatings. It has been completely up-dated to reflect recent advances, with the main responsibility for this edition been taken by Ole Øystein Knudsen, who has introduced new chapters on corrosion prevention, protective properties, coatings for submerged service, powder coatings, and chemical pretreatment, all topics he is familiar with.

Among the topics covered, there are two very informative chapters on the background and theoretical considerations of corrosion testing, and the practice of corrosion testing. The rationale of accelerated testing, including coatings for immersion service, their advantages and drawbacks, are clearly explained. The use of advanced instrumental spectroscopy methods is also included.

There is also a comprehensive reference section at the end of each chapter.

In summary, this book provides readers with useful knowledge on the practical aspects of corrosion protection with organic coatings and links this to ongoing research and development. It is available in hardback or eBook versions.

Microbiologically Influenced Corrosion in the Upstream Oil and Gas Industry, edited by Torben Lund Skovhus, Dennis Enning and Jason S Lee.

CRC Press, ISBN 9781498726566

The book contains the latest technical and scientific contributions in the field of microbiologically influenced corrosion (MIC). It is written by world leaders in the field of MIC, from both academia and industry, and in total 59 authors have contributed, sharing their perspectives on MIC.

This informative book provides an overview of subsurface and oilfield microbiology, and includes both common (non-biological) and biological degradation mechanisms. It reviews state-of-the-art approaches to MIC assessment, MIC mitigation, and MIC monitoring, and discusses the latest technological and scientific advances, as well as some excellent relevant case studies to convey to readers an understanding of MIC and its effective management. It will make an ideal comprehensive reference source for integrity engineers, production chemists, oilfield microbiologists, and scientists working in the field of petroleum microbiology or corrosion.

It is available either as a hardback, or an eBook.

Industry News

Drones used to inspect bridges

West Sussex County Council, in partnership with Balfour Beatty, has begun trials with drones to inspect bridges. These have so far been held at Swan Bridge in Pulborough and Adur Ferry Bridge in Shoreham-By-Sea, and are reported to have resulted in savings of around £8,000 compared to traditional inspection methods.

Routine inspections are carried out on all bridges every two years, and normally this requires traffic management to allow inspectors to safely carry out works at height and over water. Use of drones can reduce costs, disruption and inconvenience to members of the public by removing the need for traffic management, as well as reducing the risk to inspectors who would have had to use access equipment when working at height. Operated by Balfour Beatty’s CAA licensed drone pilots, each drone has recording equipment to allow the team on the ground to assess the condition of the bridge. To ensure the drone is operated safely, a second camera is used to film it in action, with an assistant reviewing the safety parameters around the drone in real-time.

Safety enhancing drone earns innovation award for AkzoNobel partnership

A drone developed to improve maritime safety has earned an innovation award for a partnership comprising AkzoNobel’s Marine Coatings Business, Barrier Group, DroneOps Ltd., Safinah Ltd. and a major oil tanker operator (see report in March/April 2017 issue of Corrosion Management).

The project, called RECOMMS (Remote Evaluation of Coatings and Corrosion on Offshore Marine Structures and Ships), uses virtual reality technology and semi-autonomous operation of a drone, to remotely inspect ballast tanks, and other difficult to access areas on vessels and offshore structures, such as wind farms.

The Plimsoll Award is presented each year to individuals and organizations that embody the spirit of Samuel Plimsoll. Plimsoll (1824-1880) was a Member of Parliament who dedicated his career to fighting against unsafe maritime industry practices. “The award recognizes the project for developing a drone capable of taking on the potentially hazardous work now done by crew, surveyors and independent inspectors,” says Rich Miller, editor of Professional Mariner. “This worthy initiative has a significant impact on safety and deserves the support of maritime interests around the world,” he said.
This article examines the corrosion risks, in a common strategies.

Real time knowledge of asset integrity enables onstream optimisation of the controllable variables, such as corrosion inhibition strategies and maintenance work schedules, to maximize production, whilst ensuring internal corrosion and erosion rates are kept under control. In refineries, there are many internal corrosion threats throughout the plant. Corrosion rates vary rapidly as for example, where the crude source or process conditions are changed. Again, traditional inspection methods are expensive due to access costs, put onstream optimization and validation of corrosion control strategies.

This article examines the corrosion risks, in a common application for corrosion monitoring, ie that of dew point corrosion in a refinery’s crude unit overhead system.

**Monitoring Dew Point Corrosion in Refineries**

While dew point corrosion in the crude overhead system is well-documented, the processing of opportunity, and other non-standard crudes, at a refinery can increase the risk to plant integrity from elevated corrosion across a wider area of the overheads system.

Crude Tower Overhead Corrosion

Crude-tower overhead corrosion has been well studied and documented over many years. The aggressiveness of a corrosive attack in an overhead system is a function of the amount of chloride present in the system, which in turn is a function of the effectiveness of the desalter. Inadequate desalter performance results in high chloride (salt) content in the crude oil at the desalter outlet. The chloride ions hydrolyse in the crude furnace and form hydrogen chloride which is condensed in the crude overhead system. The highest risk location for failure occurs at the point where the first droplet of hydrochloric acid condenses because this condition has a very low pH, known as the acid dew point.

If ammonia and amine-based salts are present in the overhead system, and the operating conditions favour salt formation, these compounds can create a protective layer over the hydrochloric acid and allow it to corrode the underlying metal without interruption. The hydrochloric acid dew point can move around within the overhead system, driven by changes to operating temperature, pressure and flow velocity, which traditionally make it difficult to monitor.

Crude-overhead system shell-and-tube condensers are traditionally designed with the overhead product on the shell side. The hydrochloric acid attack therefore occurs on the outside of the tubes and on the heat exchanger shell itself. While tube bundles are relatively easy to replace, excessive corrosion of the heat exchanger shell will result in loss of hydrocarbon containment. Replacement of the shell is not trivial, and would normally require a unit shutdown, resulting in loss of throughput and extensive maintenance costs, especially if the work is not pre-planned.

Light ‘Tight Oil’ (LTO) processing introduces another corrosion problem for refineries: the use of amine-based H₂S passivators can result in salt formation in the top section of the crude tower, on the inside of the tower walls on the trays, around the top pumpharound circuit, and in the product draw-offs. These salts can then form a protective layer over the hydrochloric acid, allowing very aggressive and localized corrosion to occur.

In an attempt to neutralize these amines and prevent additional salt formation, refiners are moving towards new treatment programs involving acidifying the desalter. However, if applied without care, this can also introduce acid-based corrosion around the desalter wash water system and in the desalter itself.

Most refiners use a chemical treatment program for their crude overhead system, and also closely monitor desalter performance. Common treatments use two components:

1. **Neutraliser:** often an amine-based compound or ammonia, these act to raise the pH in the overheads system and react with any hydrochloric acid present, producing an inert amine chloride-type compound.
2. **Filmer:** this is also often an amine-based compound, which is injected to cover the surfaces inside the overhead system, thereby providing a barrier to prevent the hydrochloric acid from coming into contact with the metal.

To dilute any hydrochloric acid formed in the overhead system, many crude units also employ a continuous water wash. Often, however, control systems on these water wash facilities are basic, with no guarantee of uniformity of water distribution across the exchanger banks. This can result in operators having a false sense of security in their corrosion management.

**Intrusive Corrosion Probes**

Corrosion probes have been in use since the 1960s and are a very well established technology. They rely on an intrusive sacrificial element, which sits in the process fluid and is...
normally made from the same material grade as the surrounding process equipment. As the sacrificial element corrodes, its electrical resistance changes. This change is recorded externally—usually on a locally mounted data logger (these probes are also increasingly available with wireless data retrieval). The corrosion of the sacrificial tip is used to infer the level of corrosion being experienced by the surrounding equipment. While simple to use, corrosion probes have some drawbacks and are often supplanted by other manual inspection or continuous monitoring.

**Manual Ultrasonic Inspection**

Ultrasound testing has been used in the oil and gas industry for the past 50+ years, and is a well-established technique for measuring metal wall thickness. The technique involves the generation of ultrasound waves from a transducer placed directly on the outside metal surface. The ultrasound is transmitted through the metal until it is reflected off the inside metal surface (backwall). The reflected ultrasound signal (or A-scan) is recorded, and the time difference (the “time-of-flight”) between the sending and reflected signals, provides a measurement of the wall thickness.

While the technique can be reliable, completion of a full set of measurements for a medium-sized refinery with 80,000+ corrosion measurement points is very time consuming and labour intensive, so wall thickness at a low- to medium-risk point may be measured only every 4-6 years. It is therefore very difficult to take measurements in key locations with enough frequency to measure corrosion rates with any confidence, or to link periods of high wall loss to specific feedstocks or process operations, as these require measurements on the time scale of days to be useful.

In addition, while being relatively simple, manual ultrasonic inspection has the following disadvantages:

- **Damage from high temperatures:** typically, temperatures above 100°C can permanently damage the transducer (or the technician).
- **Difficulty of physical access:** where the costs typically far outweigh the cost of the actual measurement.
- **Measurement repeatability errors:** it is highly unlikely that consecutive measurements will be taken in precisely the same location by the same technician. In addition, the equipment used, and the skill level of the technician, can vary between measurements, introducing high variability.

**Continuous Ultrasonic Corrosion Monitoring**

Permanently installed, ultrasonic, wireless wall thickness monitoring sensors are therefore a better choice for crude overhead dew point corrosion monitoring.

The installation cost of ultrasonic sensors is low because they are non-intrusive and can therefore be mounted anywhere. Wireless data retrieval enables cable-free installation, further reducing installation cost and removing any ongoing operating costs. The sensor power packs are designed to normally last until the next plant turnaround (typically, nine years is achievable), so no maintenance is required between turnarounds. This simplicity of installation makes ultrasonic sensors very suitable for use in remote locations which are only accessible during turnarounds.

To protect the ultrasonic electronics from heat, the sensor uses stainless steel waveguides to keep the electronics safely away from hot metal surfaces up to 600°C. The ultrasound is transmitted from the “sending” transducer down one waveguide and the reflection is transmitted up the other waveguide to the “receiving” transducer. As with manual ultrasonic inspection, the time-of-flight difference between the surface wave signal and the first reflection from the internal metal surface provides the wall thickness measurement.

The wireless corrosion sensors send the recorded ultrasonic signals via a wireless gateway and a wired Ethernet, or other connection, to the plant’s existing IT system. Software to process the recorded corrosion data, store it in a database for historical analysis, and make it available for viewing and analysis is installed within the plant firewall for complete security.

Advanced processing software can enhance the repeatability of the measurements, meaning that even smaller levels of corrosion or erosion, can be detected in a matter of days. This software enables the separation of the wall thickness measurement from the onset of roughening of the internal surface, the presence of which is captured separately as a colour bar called PSI (Sensor Shape Indicator) which enables significantly easier and quicker interpretation of the measurement data.

**Multiple Measurements Enhance Coverage**

Each single sensor has a measurement footprint area of approximately 1 cm², which is similar to that of manual ultrasound inspection. Thus, the probability of detecting localized dew point corrosion attack using a single sensor would be small. To increase the probability of detection, sensors can be installed as multi-point arrays at the highest risk locations based on understanding of the dew point temperature, metallurgy and equipment geometry. The number of sensors needed for each array is driven by historical inspection records, or by the proportion of the area being monitored and expected to be affected by the localized corrosion attack. The larger the area that is expected to be affected the fewer sensors are required.
Monitoring Solutions for Crude Tower Overhead Systems

A typical overhead monitoring system (figure 4) would consist of 20-30 measurement locations, with between two and five sensors per location, giving a total of 40 to 150 sensors, depending on the system configuration, metallurgy and operating conditions.

Real-time corrosion data from ultrasonic sensors installed in the crude overheads system provides an effective understanding of the equipment integrity and the effectiveness of the overhead chemical treatment program.

For example, a European refiner used a network of ultrasonic sensors installed across the overhead system to adjust the treatment chemical dosage to stabilize corrosion. Prior to optimization of the overhead treatment chemicals, corrosion rates were measured by the sensors of up to 1.2 mm/year. Over a month-long period, the refiner increased the neutraliser dosage in steps, tracking the effect on the corrosion trend provided by the sensors. Once the chemical dose had been optimized, the sensor data showed that the corrosion trend had been stabilized.

Also a North American refiner was able to monitor corrosion rates in the overhead system attributable to specific batches of crude, over a 6 month timescale, as shown in figure 5. The period marked by the red dot showed markedly higher corrosion rates than normal, although the crude type was not unusual, and had been processed previously. During this period, there were no unusual process measurements to indicate any kind of unexpected issue with processing of this crude, apart from the high corrosion rate trend.

The refiner sent samples of the crude oil to a laboratory for more advanced analysis which showed a high and unusual level of organic chloride in the crude oil, probably due to the use of well-stimulant chemicals in the upstream oil production process. As a result of this experience, this refiner now routinely tests every new batch of crude feedstock for organic acids to pre-empt any corrosion problems.

Summary

Having a monitoring system in place ensures that facility managers can make better-informed operating decisions using accurate and up-to-date information. The monitoring data can also be used to detect issues early, such that they can be controlled, and subsequently provide validation that those control measures are working adequately. Battery-operated, wireless integrity monitoring systems are ideal for inaccessible locations, where the costs and safety risks of access to the fixed equipment are high, and can bring significant benefits in cost reduction, production efficiency, safety and reliability – all ultimately improving the refinery’s profitability.
PDA Europe is organising its 11th Annual Conference on 13-15 November 2017 in the Park Inn Heathrow in London.

The applications of Polyurea are widespread and the technology keeps on innovating and improving. This conference is a unique forum in Europe for all the stakeholders of Polyurea and has been designed to discuss and present all its facets.

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First speakers confirmed!

Busting The Myths of Wet Abrasive Blasting – PETER BLOEM, Graco

Polyurea Top Coats Should Be Top Priority – HUGO HERAULT, Krypton Chemicals

Polyurea-Based Coatings & European Fire Regulation - CHRISTINA LONGONI, Mapei

Introduction on Polyurea – DIRK UEBELHOER, PDA Europe President

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Mélanie Collot
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Applying Lean Manufacturing to Corrosion Protection Processes

Lucia Fullalove, Highways England - Lean Practitioner, Dr Algan Tezel, Huddersfield University.

Defects and failure of assets during service can often be traced back to corrosion deterioration, thus corrosion monitoring and corrosion protection become a vital and integral part of asset construction and maintenance. Assets such as bridges, platforms and refineries etc require corrosion protection or monitoring as an integral part of the maintenance programme throughout the life of the asset. Several corrosion protection and monitoring techniques have been developed and these are widely used in the industry with the objective of slowing down the inevitable corrosion degradation process. The techniques selected will vary depending on the material to be protected and the exposure environment. It is important to note that application and maintenance of corrosion protection such as painting and cathodic protection are time consuming, costly and have safety implications.

In the construction environment corrosion protection and monitoring are often carried out, not as standalone activities, but alongside other work activities. Therefore, good planning, logistics and engagement with other work trades become even more crucial to ensure that the corrosion protection processes can be carried out and delivered within time, budget and at the desired quality standard.

The construction industry has adopted “Lean thinking” in order to improve the effectiveness and efficiency of construction work. This new working practice requires the use of specialist tools and techniques. “Lean” training is required to be undertaken so that “Lean” can be deployed throughout the supply chain. Since the corrosion community is part of the civil construction supply chain, it is therefore essential for corrosion specialists to become acquainted with this new work practice and to have an understanding of its potential benefits.

The corrosion protection/monitoring methodology is essentially a process which includes and relies on elements such as: manpower, machinery and equipment, material, method and information and design. This can be compared to the process requirements of a production system, with the activities forming an essential pre-requisite to delivering an effective task planning and process control. As a general rule, corrosion protection processes comprise of the elements or activities shown in Figure 1. By mapping and analysing the process stages and identifying what activities are value added or non-value added (waste), the opportunities for improvement will be revealed. Removal of waste from the process will result in projects being delivered efficiently, safer, within budget, providing required performance, and at rate required by the customer.

This article provides a snapshot of potential Lean benefits and explains corresponding Lean practices which will allow

Figure 1. Simplified generic corrosion protection/monitoring process.
the Corrosion professionals to understand the potential benefits, and to consider embracing Lean principles when working as part of the supply chain.

What is Lean?

Toyota Motor Corporation developed the principles and methodology of a production system to attain the same overarching operational targets, i.e. having a consistently effective production system and efficient processes. This production system is often called the Lean Production System (LPS), and will be referred to as Lean in this article. Lean has proven effective on many occasions in different industries. It is a customer focused and structured production management system and process improvement methodology which aims to ensure the delivery of customer requirements at the required quality standards and rates. While delivering customer expectations, Lean utilises several tools and techniques to support the removal of “waste” within a process, thus ensuring a more efficient process.

An important aspect of Lean is the collection, understanding and analysis of the ‘as is’ state before the use of appropriate Lean tools and techniques. By achieving an in-depth understanding of the present state of the process, a Lean practitioner will be able to challenge the process activities/practices.

There are five main Lean principles, which can be easily applied to corrosion protection:

1. Specify value from the standpoint of the end customer (internal or external).
2. Identify all the steps in the value stream for each corrosion protection activity and whenever possible, eliminate those steps that do not create value (the Lean wastes).
3. Make the value-creating steps occur in a tight sequence so the work will flow smoothly toward the customer. In the meantime, standardise the system to minimize variability.
4. As the flow is introduced, let the internal customer pull value from the next upstream activity.
5. Continuously improve the system using the first four steps.

In Lean, work activities of the ‘end to end’ process are assessed and categorised into:

• VA = Valued added. These are the activities which add value to the end product and for which the customers are prepared to pay.
• ENVA = Essential Non-Value Added. In this category are the legal, environmental, Health &Safety (H&S) and training requirements which are compulsory parts of the process, although the customer is not generally prepared to pay for these aspects.
• NVA = Non-Value Added (WASTE). These are activities within the process which do not add any value to the end product and for which the customer has no appetite to pay.

A model of a Value Stream mapping analysis where all activities and links are shown and classified as VA, NVA and ENVA, within a timeline, is shown in figure 2. This provides a good visual representation of the activities that can, and should, be reviewed/removed from the process, or to highlight where the main process improvement opportunities are.

In general, works across the construction industry are impacted by environmental and weather conditions and form those of a controlled and repetitive process found in the manufacturing industry. It is important to understand and adapt the fundamental Lean principles in order to effectively deploy these into one’s own work conditions. This needs to be done through customised applications.

In line with the five principles, Lean identifies ‘process wastes’ that need to be eliminated in a production system. In the corrosion protection industry, these are:

• Transportation of goods during production.
• Inventory which has to be managed, taking valuable space, time and resources.
• Movement of workers away from their workstation during the delivery of work to get tools, equipment, and materials.
• Waiting for a product from the previous activity or waiting for authorization or signatures to proceed.
• Over-processing – features which have not been required by customers and that add no value to the product’s purpose.
• Defects – defects waste time, resources for re-work and can impact on customer satisfaction.
• Skills misuse – performing work activities using staff without the appropriate training or competence.

The use of untrained staff to perform specialised activities creates defects in the short, medium and long term and it has direct impact on the protection and asset performance. Corrosion specialists are aware that the application of specialised corrosion protection, and corrosion monitoring, rely heavily on how they are executed. Often the execution of the protection is as important as the materials used. Therefore staff training is vital to the performance of the corrosion protection.

Lean Methods and Systems

At the operational level, the Lean principles are realised by implementing some Lean methodologies, tools and techniques. The selected tools and techniques used in this section have been chosen as their use seems to fit with the corrosion protection and monitoring activities, and where the corresponding benefits can easily be identified.

The Last Planner System or Pull Planning

Unlike highly structured and controlled work environments like factories and shop floors, corrosion protection of large structures/assets generally take place in dynamic and complex environments, such as: construction sites, motorways or oil platforms, where the tasks of different trades are interconnected and dependent on many uncontrollable factors. In those complex work environments, alongside systematic coordination and constant planning and re-planning, proactively and collectively eliminating task constraints takes precedence. For those purposes, the Last Planner System (or Collaborative Planning as it is called in the UK) has been successfully used in project-based production systems for more than 25 years to provide a “pull-based” production planning and control mechanism that is executed by the very “doers” of tasks. (Plans are not pushed by “planners, schedulers or senior managers” who are detached from the actual production.) The Last Planner System goes beyond the Critical Path Method (CPM), by not only effectively controlling tasks themselves, but also controlling complex process flows and trade interactions [1].
The Last Planner System is essentially a collaborative planning process or method that involves the stakeholders such as the foremen and design team leaders (the last planners) in planning in detail the work to be done throughout the project. The discussions become more and more detailed as the work progress. This technique was created to enable more reliable and predictable production in projects. It also supports the flow of work through the project, building trust and collaboration within a project team and delivering safer projects faster. It brings together those who will execute the work (the team) to plan when and how work will be done through a series of conversational processes. It requires the group to remove constraints collaboratively as a team and to promise delivery of each task for the team.

These systematic processes increase the chances that the work flows reliably, and recognizes that personal relationships and peer pressure are critical to that process. The basic planning stages of the Last Planner include:

A) Master scheduling; front-end planning to set the project milestones that incorporates the CPM logic to determine the overall project duration.

B) Phase scheduling; a detailed schedule dividing the project into discrete phases. It specifies handoffs through reverse scheduling the project to understand how to meet the milestones identified in the master planning together with all teams and trades.

C) Look-ahead planning; the pull planning phase covering two-six week periods. It is used to breakdown activities into detailed processes/operations, to regularly identify constraints, to assign responsibilities and to make assignments ready.

D) Weekly work plans or commitments; the most detailed plan in the system showing interdependence between the work of various specialist organisations. It directly drives the production process. At the end of each plan period, assignments are reviewed to measure the reliability of planning and the production system. Analysing reasons for plan failures and acting on these reasons is used as the basis of learning and continuous improvement.

The Last Planner System is highly applicable in corrosion protection planning and control. As there are several trades working together under complex project systems in corrosion protection, and sometimes within a confined space and with limited time to complete the work. The Last Planner System would render an effective mechanism to engage the trades and to ensure they all understand the impact of each of their activities on others. Such as, if the scaffolding is not in place in time, the blasting is delayed or the fact that the paint or the equipment is not in place, will impact on the delivery time and the process flow.

As the process progresses, a daily meeting should take place to check, in detail, what has gone well, what has not gone well and why. This is known as the 3Cs tool (Concern, Cause and Countermeasure) and it makes certain that the day meeting is focused on these points. This practice also ensures that all raised concerns are discussed and addressed by those involved in doing the work, as resulting actions will promote improved work flow for the next day or shift.

Visual Management and the 5S

Lean work places rely extensively on visual communication (i) to make deviations and non-compliances obvious, (ii) to increase coordination, (iii) to reduce complexities in the work environment, (iv) to help teams to understand the purpose of communication easily, (v) to facilitate process transparency to reduce the number of work-related questions people may pose, (vi) to guide people to work efficiently on their own (self-control), and (vii) to reduce human-related errors. This conscious information visualization or work-facilitation strategy is called Visual Management. For instance, the daily team meetings are held around performance boards to review past performance and future constraints, which display the key performance indicators (KPIs). The pace of processes and material consumptions as per production plans, can be regulated in a “pull” fashion by using simple cards called kanban. (Kanban is Japanese for “visual signal” or “card.” Toyota line-workers used a kanban, i.e., an actual card, to signal steps in their manufacturing process).

In order to realise Visual Management, a systematic visual workplace framework should be followed (see Figure 4).

A brief explanation of the framework elements is as follows:

- Visual order (the 5S) which stands for Sort, Set in order, Shine, Standardise and Sustain: Creating a visual workplace should start with adopting the systematic 5S methodology to create better organised, tidier, and cleaner workplaces to increase productivity, reduce risks, better control materials and equipment and to provide a better working environment. The 5S is an acronym for the 5 distinct steps involved.
  - (i) sort for organising the workplace in an efficient way and eliminating unnecessary items,
  - (ii) set-in-order for standardising the location, quantity, responsibilities etc. of the remaining necessary items,
  - (iii) shine for implementing a systematic cleaning and inspection mechanism,
  - (iv) standardise for standardising the methods, procedures and responsibilities for the first 3S, and
  - (v) sustain for implementing some supporting activities like training, team building, incentives etc. to sustain the 5S

- Visual standards: Work standards in terms of process procedures (i.e. the most efficient and safe way of completing a high-quality process with required durations) and process outcomes (i.e. high-quality outcome features) are visually demonstrated to work teams at their point of use, close to where the actual process is going to happen. Standards are effectively built into the workplace.

- Visual measures: General and team level KPIs are regularly maintained and shared with work teams.

- Visual controls: Visual controls are visual clues or small artefacts that are used to limit and guide human actions.
For instance, in the pull-production system, production signals from succeeding workstations are given to preceding workstations through the exchange of simple cards called kanban. Without a kanban card, the preceding workstation does not start any production. By issuing a certain number of cards to workstations, the production pace and material consumption rates are controlled.

• Visual guarantees: Human beings are prone to making mistakes. The important thing is to prevent mistakes from becoming defects. Visual guarantees are devices, process design elements or product features designed to counter human failures by either warning people of mistakes, rendering making mistakes harder or controlling the effects of their mistakes.

Continuous Improvement tools
Continuously improving process (i.e. methods, tools/equipment, and information systems) and workplace elements are an integral part of Lean. There are some frequently employed continuous improvement strategies, tools and techniques, and examples of these can be found in the extended version of this article on the website.

Corrosion Protection and Lean
The table below summarizes the Lean tools and techniques that could be deployed in corrosion protection/monitoring processes and identifies their potential benefits. It should be noted that this table highlights only some initially conceived connections that can, and will, be expanded as the implementation progresses and matures.

<table>
<thead>
<tr>
<th>Corrosion protection</th>
<th>Lean tools/techniques</th>
<th>Objective</th>
<th>Benefit/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-corrosive painting</td>
<td>The Last Planner System</td>
<td>Ensure all stakeholders/trades are aware of the various activities and their impact on the overall process &amp; understand customer expectations at every stage of the process</td>
<td>Check the opportunities for changes within the work activities to minimise, effort, time, e.g. This can be as simple as leaving access ladders in place for the next work activity</td>
</tr>
<tr>
<td>Painting</td>
<td>Critical to quality (CTQ) analysis</td>
<td>Ensure that stakeholders understand what and how their work needs to be performed to the satisfaction of their customers. That should reduce time waste as result of re-work before the follow up activity can be performed.</td>
<td>Reduce constraints/re-work</td>
</tr>
<tr>
<td>Painting</td>
<td>5S</td>
<td>Ensure that materials and equipment are kept under controlled environments, ready to be handed at the start of the work and labelled and within up to date calibration dates</td>
<td>Prevent delays to the process, ensure PPE reducing H&amp;S issues. Ensure paint material not exposed to temperature extremes which will result in material deterioration. Prevent wasted time trying to find the right equipment/materials to perform the work.</td>
</tr>
<tr>
<td>Painting</td>
<td>Use of kanban</td>
<td>Ensure that there is a flag raised at the end of each stage to ensure the next stage starts only once the previous is completed, thus preventing awaiting time and uncertainties</td>
<td>Maximize performance, managing workflow and ensure each stage is finalized and/or inspected before next one starts to prevent defects</td>
</tr>
<tr>
<td>Painting/Cathodic Protection</td>
<td>Skills checking</td>
<td>Ensure workmanship has necessary training and skills to perform the tasks</td>
<td>Maximize coating/anti-corrosive performance thus prevent early failures increasing asset whole life costs. Prevent waste due to skills misuse.</td>
</tr>
<tr>
<td>Cathodic protection</td>
<td>The Last Planner System</td>
<td>Ensure all stakeholders/sub-contractors are aware of the required access, tools, materials &amp; skills necessary to allow for the implementation of the Cathodic protection</td>
<td>Prevent time waste, delay on the works, reduce performance of the system.</td>
</tr>
</tbody>
</table>

**Conclusion & Recommendations**
Material deterioration as result of corrosion is often accepted as unavoidable and it has led to the lack of awareness of the economic aspects of corrosion. The estimated cost of corrosion as per Hoar committee findings is around 3.5% of the UK GDP (Hoar report – 1971, [3]). For major asset owners, maintenance of the anti-corrosion technology is an integral part of the asset design and management to ensure asset integrity within its service life.

Maintenance intervention for corrosion protection is costly and the number of interventions will vary with asset design life, quality of the protective material, workmanship and service environment. Deployment of Lean is likely to improve the efficiency and effectiveness of corrosion protection/monitoring. This can be achieved by using the Lean techniques described in the previous sections.

As examples:
• Finding improvement opportunities by mapping the ‘as is’ process - the identifying and removing wastes,
• By improving/promoting staff engagement among the various trades involved in and around the corrosion protection/monitoring opportunities for improved work practices are identified
• Preventing defects by continually training specialist staff who specify, and perform corrosion protection, corrosion monitoring as well as those who perform inspection work.
• Employing the Last Planner for improved task coordination.
• Using VM techniques to increase the transparency and control in corrosion protection and corrosion monitoring processes.

Deployment of the Lean tools and techniques will result in reduction of time, cost and H&S risks associated with corrosion protection and monitoring. Applying the Lean principles to corrosion protection and monitoring will also improve the quality and reduce the whole life cost of major assets which will be of a direct benefit to asset owners and customers.

Raising awareness of Lean among corrosion protection professionals and documenting some implementation cases seem of critical importance for Lean to diffuse into the corrosion protection sector.

References:

Acknowledgments:
The authors would like to thank John Fletcher of Elcometer and past President of the Institute of Corrosion and Katie Jones - Lean Manager of Graham Construction for their contributions to this article. Photos were supplied by Katie Jones and Andrew Fielding, Costain.

Editors note: A more detail version of this article can be found on the website.

Maintaining Aging Assets - Short Term Coating Solutions

S Hope, Technical Authority at Auquharney Associates Ltd.

There are many aging assets, particularly in the N Sea, which are likely to be decommissioned in the near future, or where due to enhanced recovery techniques etc these platforms are required to remain in use for a few years more. A rethink about the way maintenance of these assets is undertaken is needed, for example by looking at coating systems for less than three years, and perhaps up to five years protection, and the surface preparation necessary. Convention has always been to prepare surfaces by either mechanical power tool or abrasive blasting to get a substrate ready for a multi-coat coating system. Many such systems are designed and based on yard production of new steel in new construction, and not on the aged and heavily corroded steel that actually exists offshore. The majority of coatings currently used are relatively high
Technical Article

Equipment, thus low tech application requiring minimal

- Low cost, simple, easy application - no need for expensive
- Surface tolerant, ambient conditions tolerant
- Single coat application, single pack material

Following criteria:

In reality therefore a coating (and procedure) that provides

enough protection to maintain adequate integrity to a structure

so that it remains serviceable for its remaining working life,

and can be carried out for the minimal cost expenditure, is

all that is needed. An ideal coating would therefore fulfill the

following criteria:

- Minimal or zero preparation
- Single coat application, single pack material
- Surface tolerant, ambient conditions tolerant
- Low cost, simple, easy application - no need for expensive equipment, thus low tech application requiring minimal skills set
- Low health and environment risk

This article describes research carried out from a contractor’s point of view into new procedures for maintenance of these aging assets.

Background

Having set the above criteria for an alternative maintenance strategy, the first step was to identify which materials were already known to have a track record that would meet the requirements. Not surprisingly there were very few that sprung to mind, one however did, being a water based acrylic which had been used successfully on various structures to good effect, including HMS Belfast, that had her topsides coated in the mid ’90s for purely cosmetic reasons. This involved just washing down and the coating applied with brush and roller operating between 60-70% coverage. After 20 years exposure to the environment of the Thames in central London, the coating has stood up remarkably well and should be good for many more years to come. Another material which has similar credentials is a solvent-based acrylic designed for repairing shipping containers in less than ideal situations.

Both these materials were therefore re-evaluated as to their suitability for the short term protection of aging assets. They were easily applied as a single coat to a damp surface under hardly ideal conditions to different substrates during the winter, with intermittent rain, low temperatures and high humidity, all quite representative of the weather offshore.

Initial testing

A bare carbon steel pipe, which had been exposed vertically to a C4M environment, some 500 metres from the coast, for several years, and which had developed a significant amount of surface corrosion, was selected as the test substrate. Half of the surface was washed with fresh water, and the other half left untouched. The materials were applied to both areas using a 2” brush, according to the manufacturer’s technical data sheets, to give dry film thicknesses, on both areas, of between 75-100 microns. The test areas were left for 7 days to dry thoroughly before being subjected to pull-off adhesion testing. The results of this were remarkably consistent, and, once prepared, preserving the optimum substrate has been increasing due to the awareness of the level of coating failures. Most specifications from oil majors now clearly define the acceptable levels of surface contamination, or at least make reference to other standards, such as Norsok M-501, that outline recognised expectations.

The usual guide lines are all very much the same and require removal of all contaminants as far as practically possible, normally loose dirt and debris by dry brushing with a stiff bristle brush, and grease, oil and other adherent contaminants by fresh water wash along with a suitable water soluble degreaser/detergent.

There may then be a further set of criteria revolving around soluble salts/chlorides, normally presented as a quantitative maximum level of contamination expressed as mg/m² or µg/cm². For atmospheric exposure 50mg/m² and for immersion service 250mg/m² are typically representative. (these are general arbitrary levels, and have been taken in this case from Norsok M-501).

Quality control varies but usually a close visual inspection and one of the recognised quantitative chloride ion tests are undertaken along with an assessment of residual dust based on ISO 8502.

Even with all the above in place, we still have failures, so what can be done to help improve the situation?

Getting the surface clean before blasting or other surface preparation is started is of paramount importance. If contamination is not removed, all that happens is that undesirable contaminants just get driven into the substrate, where before it often sat on top of existing coatings, it is now firmly embedded into the base metallic substrate, leading to premature failure.

There is also the issue that the ‘potable’ water being used is not the cleanest, so called ‘town water’ or ‘drill water’ may well have high chloride levels and may actually be exacerbating the situation rather than solving the problem.

Adopting a very specific cleaning solution can radically reduce the problems above, eg an alkaline degreaser that also reacts with, and reduces chloride contamination, both on the substrate and in the water being used, as well as stabilising
corrosion products. Used as a 5-20% solution in clean potable water, it can be applied by either hand scrubbing brush or pressure washing unit. Once applied and worked well into the surface, it is left for a minimum of 30 minutes before rinsing off.

Mechanical power tool cleaning may be undertaken on the wet surface, likewise wet abrasive blasting. Dry blasting can either be done on the damp surface or after it has dried off.

Once surface preparation has been completed, the area can then be washed down with another specific solution, containing corrosion inhibitor, which can also affect removal of any residual debris and contamination from the surface and neutralise any remaining cleaning solution leaving a pH 7 substrate.

As stated above, one of the major problems, particularly offshore, is surface contamination in the form of soluble salts and oily/greasy residues. If these are removed, and the surface passivated, then the life of any coating will be significantly improved. A further test was therefore carried out on a further piece of C4M exposed steel using a single-pack, moisture cured polyurethane wash, which could help stabilise the substrate, as it acts by penetrating the corrosion products, and as it is moisture cured, it can dehydrate any scale present.

Test results showed that adhesion was improved to around 6 MPa, and failure was closer to the steel substrate (showing that more of the corrosion products were bound up to the coating).

There was however the issue of isocyanates with this product that then meant that, though the results were encouraging, the potential risks involved with its use basically precluded it from further testing.

These encouraging initial results lead to further testing of alternative surface preparation methods to power or hand tool cleaning. A selection of chemicals with the following behaviours: cleaning agents, reactive light descalers/de-rusters, rinse aids and inhibitors, was obtained. Each was tested individually at a variety of concentrations, all bucket and brush applied to keep preparation to the barest minimal levels.

Surface preparation of rusted steel was restricted to very light hand wire brushing, manual chipping to remove some scale, and brushed off with a worn nylon sweeping brush. This is well below even St2 standard. (Degreasing performance was checked on the telescopic mast of a forklift as this was heavily greased and very dirty.)

Once each material’s performance had been tested, then the individual components of those that were felt to have performed the best, were blended together; adjusting concentrations to optimise performance until one blend was found that gave a visible derusting, along with powerful cleaning and degreasing, when applied from a bucket by brush.

This blend was therefore assessed by carrying out the proposed basic surface preparation/cleaning/coating procedure on a rusty beam.

As the performance is obviously time dependent, the optimum blend was left for 60 minutes on a well rusted and exposed beam with very minimal hand wire brushing; and after rinsing off had all the appearances of an St3 surface with a slight metallic sheen (see below) when closely examined.

To further confirm that this procedure was feasible, a corroded steel panel, roughly 500 x 500 mm, that had been lying outside for several months, was subjected to the proposed full system: 1 minute wire brushing, cleaning solution applied, rinsed with inhibiting solution and 1-coat of the water based acrylic applied by brush at 125 – 150 micron WFT. Starting from rusty steel to first paint coat took approximately 20 minutes.

The following day the panel and the steel beam, having been left out in the rain for 24 hours, were tested on the uncoated areas, for residual salts using a Breslé patch test. All the test areas were assessed to see if there were major variations, and visually checked for degradation. The results were very encouraging, all test areas on the big beam fell in the range of 3.5 to 4.5mg/m², which is still well inside the expected levels for fabric maintenance, interestingly however the result for the panel was even better at 2.1 mg/m², and would very clearly meet vessel internal levels of salt contamination (before testing the salt readings were over 150mg/m² as the items had been seeded with hypertonic salt solution over several days and allowed to dry out).

A further contrasting coat of the water based acrylic was applied - it should be noted that the drying time of this material is remarkably quick, around 60 minutes. Grey over red showing total obliteration in a single brush coat.

The panels were left outside fully exposed to the environment, with wind, rain, frost (to -6°C) and direct sunlight all in a coastal marine environment. The first full check undertaken was after approximately 2 weeks, this allowed the coatings to cure fully and inter-react with the cleaners/inhibitors. Visually there were no signs of degradation from the original condition, no
visible rust activity at the exposed steel, or under the applied coatings, no rustrashing or breakdown.

Pull off adhesion testing using a HATE gauge, gave readings in the range of 2.5 to 3.5 MPa, failure occurred within the coating as a cohesive failure, and at rust scale to substrate interface. The relative weakness of the water based acrylic coating should ensure that any adhesive failures are not coating driven.

A second set of adhesion tests and visual inspection were undertaken 1 week later. Dollies were placed using 2-pack epoxy adhesive, and left to fully cure. Pull-off tests were done again using a HATE gauge and adhesion readings were 3.5 – 4.5 MPa, again no specific areas of failure were observed, and this was deemed an acceptable result.

To test the effectiveness of the chemicals alone to provide protection and inhibition, a test panel was dry blasted, the bottom half washed with both products and the top half left untreated. The panel was then left outside in a coastal location, fully exposed to weather and environment. Within 2 days there was noticeable corrosion and gingering of the upper section and a clear line of demarcation where the washing started. After about six months, where there was very significant corrosion products forming on the upper section, only a light layer of rust was beginning to form on the lower treated section.

Further verification

Subsequent to the tests already carried out, the decision was made to carry out a second test using the same preparation and coating system in order to replicate the results of the first trial.

Again, the only tools used for this trial were a hand wire brush, bucket, deck scrubber and 2” conventional paint brushes. The test was carried out on an unpainted scaffold rack that had been exposed to a marine environment for an extended period of time.

The substrate was wire brushed to an unspecified standard and washed with the same mixture and concentration of a proprietary rust remover, cleaner and de-greaser as used on the steel panel in the first trial. The rack was left to dry for 30 minutes then rinsed and the corrosion inhibiter applied. Once the rack had dried, a Breslé Patch salt test was carried out and a reading of 2mg/m² obtained, which is very acceptable result, and falls well below that expected. The first coat of the water based acrylic primer was applied at a wet film thickness of 125µ, the rack left to dry/cure for 40 minutes and then a second coat of acrylic was applied to 2/3 of the structure, also at 125µ.

Conclusions

Minimal effort was expended to do these tests deliberately, introducing some form of mechanical preparation or pressure washing should prove to be an improvement over what has been done here. Full operation from start to finish was completed within 3 hours, this included waiting periods between operations.

All the results from the first test were successfully replicated and adhesion tests were carried out on the second test after the test piece has been left to weather for an extended period of time, and the same results obtained. Now a further 2 years down the line, breakdown has proven to be minimal on the panels with no evidence of major corrosion reactivating itself. Areas where scale has been overcoated on the beam are not showing any signs of breakdown of the coating which is still intact and unstained. Various areas have been tested for performance and further more in depth laboratory testing has been undertaken along with accelerated salt spray, all of which have confirmed the original hypothesis.

The scaffold rack was only partially second coated, as with the first test plate, and both are being left outside, and will frequently be re-inspected to see how the system performs. Again, no major evidence of coating breakdown, small amounts of rust staining has become evident where the single coat has been applied, areas with two coats are completely sound, after 15 months exposure.

The water based acrylic coating is a well-established material with long term track record in a variety of applications and as such is commercially available. The blend of cleaning/rinsing solution developed is now being produced commercially by a major supplier.

By using these two products, we can effectively produce as close to an ideal substrate in one of the most hostile environments as is practical. By carrying out effective grease and salt removal before preparation, and then fine dust removal and corrosion inhibition to a pH neutral substrate, any coating applied has the best chance of performing to its optimum level.

This complete system is now being used offshore and is into the third year of monitoring with results still holding good.

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New DFT Gauge

Inspection instrument manufacturer DeFelsko has introduced a new dry-film-thickness gauge for measuring coating thickness on metal substrates.

According to the company, the new PosiTest DFT can take over 60 readings per minute, and has onscreen averaging for up to 99 readings. It features a high-contrast LCD display that auto-rotates.

The gauge comes in two models—Ferrous, for measuring nonmagnetic coatings on steel, and Combo, for measuring nonmagnetic coatings on all nonconductive metal substrates, including aluminium and brass. According to DeFelsko, the Combo model automatically recognizes the substrate. The instrument includes a ruby-tipped probe with a V-groove, a built-in wrist strap and the capacity to measure in mils or microns.

Offshore Coatings Made for Maintenance

Jotun has introduced a new coating line for offshore maintenance, designed specifically for brush and roller application to power-tooled and waterjetted surfaces.

The coating products consist of a ceramicly reinforced zinc-rich epoxy primer (Barrier Smart Pack), a high-solids, high-build epoxy mastic coating (Jotamastic Smart Pack HB), and a single-component polysiloxane (Hardtop One). The three coatings are stand-alone products and can be used together as a three-coat system.

According to Jotun, these coatings comprises the world's first NORSOK M-501-approved brush- and roller-applied coating for power-tooled and waterjetted offshore surfaces, and address the issue in the offshore industry of a lack of coating products designed for ongoing maintenance.

“Until now, offshore maintenance solutions were typically designed and tested in accordance with standards for new constructions,” said Lasse Isaksen, global concept director for Jotun's Offshore division. “This simply does not reflect the challenges that our customers experience when maintaining existing assets.”

According to the manufacturer, each of the three products presents a specific solution to an existing issue with offshore coating. Barrier Smart Pack is designed to extend system life and for ease of application, in addition to brush or roller, it can be applied via airless spray if preferred. Jotamastic Smart Pack HB is designed for ease of application and can be applied at a high film thickness. (Jotun typically recommends a wet film thickness of 130 to 260 microns, resulting in a dry film thickness of 100 to 200 microns), and Hardtop One is made for one-component application as a topcoat, it does not contain isocyanates and does not produce di-isocyanates during hot work, the company notes.

New Wall thickness gauges for today’s Paint Inspector

Fischer Instruments (GB) Ltd, part of the Helmut Fischer Group, has announced the launch of its new UMP line of wall thickness gauges.

Unseen corrosion of steel structures presents a great risk to people and property and a reliable, non-destructive test method is required to evaluate the integrity of these structures. The challenge lies in measuring the steel’s thickness, ie how do you differentiate the thickness of its paint coating from the thickness of the steel? Conventional ultrasonic gauges don’t separate the paint from the steel, yielding errors because they show a total thickness (paint and steel). The inspector must first remove the paint coating from the test area, inspect the location and then repaint - unnecessary steps which raise the cost. The most modern ultrasonic gauges overcome these hurdles by analysing the acoustic signature of the material using the ‘echo to echo’ evaluation technique. This allows the paint inspector to measure the thickness of steel through the paint coating. A-scans and B-scans evaluate the quality of a measurement and offer a cross sectional view respectively. Fischer’s UMP line provides addition features to improve usability, and places particular emphasis on ease of upgrade to the unit’s firmware and software packages (PC UltraDatex) that allow for easy offloading of data to a PC. With a compact IP45 rated case, the line offers a wide selection of transducers to meet the most challenging measurement needs, concluded the company.

New half mask respirator

Scott Safety has launched the AVIVA, its new half mask respiratory protection device, which features a low-profile head harness offering greater stability and compatibility with safety helmets and eye protection. According to the company, the new mask, which is silicone-free but designed with silicone-like comfort, features novel design elements. The mask has a reflex seal which allows the wearer added movement and flexibility, and a positive fit check button is built into the device guaranteeing a secure fit. Enhanced voice intelligibility enables the wearer to be clearly heard by those around ensuring clear lines of communication. The AVIVA half mask is available for use with a wide range of filters permitting use of the device in a variety of applications and industrial situations, concluded the company.
CATHODIC PROTECTION CONSULTANCY SERVICES

BEASY
Ashurst Lodge, Ashurst, Southampton, Hants, SO40 7AA
Tel: 02380 283223 Fax: 02380 292853 Email: t.froome@beasy.com www.beasy.com

CORROSION CONTROL
3 Ivy Court, Acton Trussell, Staffordshire, ST17 0SN
01785 711560 Fax: 01785 711561
Email: brianwyatt@controlcorrosion.co.uk www.controlcorrosion.co.uk

CORROSION ENGINEERING SOLUTIONS LTD
Unit YF19 Akeman Business Park, B1-82 Akeman Street, Tring, Herts, HP23 8AF
Tel: 01442 787 889 Email: info@corrosionengineering.co.uk www.corrosionengineering.co.uk

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Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com

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Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com

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Tel: 02380 283223 Fax: 02380 292853 Email: t.froome@beasy.com www.beasy.com

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Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com

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Tel: 02380 283223 Fax: 02380 292853 Email: t.froome@beasy.com www.beasy.com

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01785 711560 Fax: 01785 711561
Email: brianwyatt@controlcorrosion.co.uk www.controlcorrosion.co.uk

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Tel: 01442 787 889 Email: info@corrosionengineering.co.uk www.corrosionengineering.co.uk

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GO2 & GO3 The Bridgewater Complex, Canal Street, Bootle, L20 8AH Tel: 0151 5500015 Fax: 0151 5500016

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Chase End, The Oxhey, Tewkesbury, Gloucestershire GL20 6HR
Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com

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Tel: 02380 283223 Fax: 02380 292853 Email: t.froome@beasy.com www.beasy.com

CORROSION CONTROL
3 Ivy Court, Acton Trussell, Staffordshire, ST17 0SN
01785 711560 Fax: 01785 711561
Email: brianwyatt@controlcorrosion.co.uk www.controlcorrosion.co.uk

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Unit YF19 Akeman Business Park, B1-82 Akeman Street, Tring, Herts, HP23 8AF
Tel: 01442 787 889 Email: info@corrosionengineering.co.uk www.corrosionengineering.co.uk

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GO2 & GO3 The Bridgewater Complex, Canal Street, Bootle, L20 8AH Tel: 0151 5500015 Fax: 0151 5500016

PRO-TECH CP LTD
Chase End, The Oxhey, Tewkesbury, Gloucestershire GL20 6HR
Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com

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Tel: 02380 283223 Fax: 02380 292853 Email: t.froome@beasy.com www.beasy.com

CORROSION CONTROL
3 Ivy Court, Acton Trussell, Staffordshire, ST17 0SN
01785 711560 Fax: 01785 711561
Email: brianwyatt@controlcorrosion.co.uk www.controlcorrosion.co.uk

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Unit YF19 Akeman Business Park, B1-82 Akeman Street, Tring, Herts, HP23 8AF
Tel: 01442 787 889 Email: info@corrosionengineering.co.uk www.corrosionengineering.co.uk

CUMBERLAND CATHODIC PROTECTION LTD
GO2 & GO3 The Bridgewater Complex, Canal Street, Bootle, L20 8AH Tel: 0151 5500015 Fax: 0151 5500016

PRO-TECH CP LTD
Chase End, The Oxhey, Tewkesbury, Gloucestershire GL20 6HR
Tel: 01684 298679 Mobile: 07717 487632 Email: psmsmith@protechcp.com www.protechcp.com
DUVINE LTD
Sturmer Road, Haverhill, Suffolk, UK, CB9 7UU
Tel: +44 (0)1440 706777  Fax: +44 (0)1440 762810
Email: sales@duvine.co.uk  www.duvine.co.uk

HCL FASTENERS LTD
Clamping House, 1st Avenue, Westfield Ind. Est.,
Radstock, Bath BA3 4BS
Tel: 01761 417714  Email: sales@hcl-clamping.co.uk  www.hcl-clamping.co.uk

IMPALLOY LTD
Bloxwich, Walsall, West Midlands, WS3 2XN
Tel: 01922 714400  Fax: 01922 714411  Email: sales@impalloy.com  www.impalloy.com

MGDUFF INTERNATIONAL LIMITED (GOLD MEMBER)
1 Timberline Estate, Gravel Lane, Quarry Lane, Chichester,
West Sussex, PO19 2JF
Tel: +44 (0) 1243 533336  Fax: +44 (0) 1234 533422
Email: sales@mgduff.co.uk  www.mgduff.co.uk

MME GROUP
Material Metingen Europe BV, Rietdekkerstraat 16,
PO Box 4222, 2980 GE Ridderkerk, The Netherlands
Tel: +31 (0) 180 482 828  Fax: +31 (0) 180 462 240
Email: info@mme-group.com  www.mme-group.com

NORTH EAST CORROSION ENGINEERS LTD
West Pitmillan Business Centre Foveran, Ellon, Aberdeenshire
Tel: +44 (0) 1358 788116  Fax: +44 (0) 1358 789828
Email: sales@neceltd.com  www.neceltd.com

SILVION LIMITED
The Brambles, Grantham Road, Old Somerby, Grantham, Lincs,
NG33 4AB, UK
Tel: 01476 590932  Fax: 07872 857310  Email: sales@silvion.co.uk
rbritton@silvion.co.uk  www.silvion.co.uk

B.I.G. GROUP INTERNATIONAL LTD
Unit 4A Eagle Park Drive, Warrington, Cheshire WA2 8JA
Tel: 01925 241250  Email: info@big-internationalgroup.com

BRIDGECOAT LTD
3 Shawcross Industrial Estate, Ackworth Road, Hilsea,
Portsmouth, PO3 5JP
Tel: 02392 666161  Email: info@bridgecoat.co.uk

DENHOLM INDUSTRIAL SERVICES
200 Carmichael Street, Glasgow, G51 3QU
Tel: +44 (0)141 446 3030  Email: Damian.O’Brien@denholm-industrial.com

D.F. COATINGS LTD
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London Branch publish a monthly Newsletter; to be included on the circulation list please contact:
Sarah Vasey sarah.vasey@sherwin.com

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BRANCH DATES

29th August 2017
Aberdeen Corrosion Awareness Day
A full-day course, comprising of a number of lectures covering different aspects of corrosion, providing basic information on corrosion principles and mechanisms of corrosion control.
Venue: Palm Court Hotel, 81 Seaford Road, Aberdeen, AB15 7YX, 8:30 am - 5:00 pm
Further details can be obtained from Aberdeen Branch

4th September 2017
North West Branch
Speaker: Chris Atkins of Mott MacDonald
Topic: New ISO Standard on Cathodic Protection Training
Further details can be obtained from the Branch Secretary

26th September 2017
Aberdeen Branch joint meeting with TWI
Speaker: Susan Jacob of CAN
Topic: An Investigation into the Wrinkling Phenomenon on CRA Pipelines and Its Impact on Pipeline Integrity.
Presentation to start at 6.30pm
Venue: Palm Court Hotel, 81 Seaford Road, Aberdeen, AB15 7YX
Further details can be obtained from Aberdeen Branch

12th October 2017
London Branch/Young ICorr joint meeting with LMS
Venue: Imperial College, Skempton Building, London SW7 2BB
18.15 Doors Open - Social Quarter of an Hour, 18:30 The Main Event.
Topic: Corrosion challenges and considerations for the design and installation of 316 stainless steel-clad subsea flowlines.
For further information please contact icorr.london@gmail.com or george.winning@clariant.com

19th October 2017
London Branch joint meeting with Society of Chemical Institute
Venue: SCI, Belgrave Square, London, SW1X 8PS
Topic: From the Foundations of Electricity to Modern Corrosion Failures
Speakers: Dr F Parrett, SCI and Dr D Eyre, ICorr
This event includes two presentations, the first on the historical background of electricity, the second a report on the recent problems of AC Corrosion on pipelines. A networking drinks reception will follow the talks at 19:30. The event is free to attend, but please register in advance via http://bit.ly/ LG191017 to avoid disappointment. The event is open to SCI, ICorr, IOM3, LMS and TWI members and guests. See page 11 for more details.

31st October 2017
Aberdeen Branch Special Event (Composite Wraps)
Venue: Palm Court Hotel, 81 Seaford Road, Aberdeen, AB15 7YX
Presentation to start at 6.30pm
Further details can be obtained from Aberdeen Branch

28th November 2017
Aberdeen Branch – IOM3/ICorr Joint Technical Meeting sponsored by the Mining Institute of Scotland
Presentation to start at 6.30pm
Topic: Composite Engineering in 2017
Venue: Palm Court Hotel, 81 Seaford Road, Aberdeen, AB15 7YX
Further details can be obtained from Aberdeen Branch

7th December 2017
London Branch Christmas Lunch
Details to follow.

30th January 2018
Aberdeen Branch – Special Event
(Cathodic Protection)
Venue: Palm Court Hotel, 81 Seaford Road, Aberdeen, AB15 7YX
Further details can be obtained from Aberdeen Branch

ADDITIONAL DIARY DATES

15th May 2018
CEOCOR 2018 International Congress and Technical Exhibition
ICorr will host the 2018 CEOCOR Congress in Stratford-upon-Avon. For further details see www.ceocor2018.com

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