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Institute News

The President Writes

Even though the weather seems to want to slow us down in the UK, the Institute continues to move forward at a pace. The last council meeting which was held at the end of February in Northampton, was very lively indeed, and shows the passion that is held by council members for the Institute. Further development plans are in motion and I hope that members are starting to see increased activity. New dates are planned for the “Fundamentals of Corrosion” course in locations around the UK. Branch activity is very encouraging, the informative and dynamic report from Aberdeen was a highlight!

Our search for a new home for the Institute is ongoing, and we are investigating a potential site as I write this.

The route to Chartered Status is moving along and if anyone would like more details on how to get involved with this, as either a mentor or candidate, please contact David Mobbs.

The new season of the Young Engineers Programme is in full swing, with our great thanks to CB&I in Paddington for offering a venue for this excellent initiative, and also thanks to the sub-committee of George Winning, Trevor Osborne and David Mobbs, for putting in the effort to run this.

In May, the CECOR Congress will be coming to the UK, Brian Wyatt is the current President and together with an ICorr committee headed by Steve Barke, have organised what looks to be a fantastic event, and when I last checked looked like we will be soon reaching capacity. This is an event well worth attending if you are involved in the pipeline protection field. I will have the pleasure of being there and I hope to see ICorr being strongly represented.

As a final reminder to all, if you would like to progress your professional standing with the Institute, then we would welcome any applications, and if you have any questions on this process please contact the Northampton office.

Sarah Vasey, ICorr President

From the Editor

This issue again has two technical articles covering different aspects of our industry. Firstly there are details about a new inspection technique for monitoring pipeline defects and accurately determining depth of cover and exact position of the line. Secondly there is a look at specification of coatings for the long term protection of offshore wind towers. Also starting this month, is a column featuring case studies. The first two describe refurbishment of a power station penstock in a remote area, and the lining of new vessels for an oil field upgrade. I hope you will find this new feature of the magazine interesting.

Remember, it’s your magazine, and I welcome comments and views on the content and suggestions for improvement. I can be contacted via the Northampton office.

Brian Goldie, Consulting Editor

Young Engineers Programme

The second presentation of the 2018 YEP, again held at CB&I in London, was an excellent talk on the complexity of welding & cutting together with Non-Destructive Testing, given by Alan Denney. This covered the basics, the common welding processes, choosing the process, and Oxy-fuel cutting and Air-arc gouging.

The NDT component dealt with Magnetic Particle Inspection, Liquid Penetrant Inspection, Radiography and Manual Ultrasonic Testing, although it did not cover visual inspection which is the most common inspection method used.

The group then enjoyed a networking session after the meeting at a local Lebanese restaurant courtesy of the Institute of Corrosion.

Thanks go again to Sadegh Parvizi for the use of the CB&I facilities, and to Alan Denny for the presentation.

Visit the ICorr website for all the latest news
www.icorr.org
ICATS (Steve Barke)

The ICATS scheme is going from strength to strength with a number of new companies joining the scheme following the increased number of projects in both Highways and Rail.

We are pleased to announce that David Mobbs has joined Correx and will be responsible for the promotion and expansion of ICATS. David has a long history in the coating industry having first worked for Corroless in 1980 followed by 5 years as an applicator before joining Sigma, and then finally the Global KAM team at International Paint.

Supervisor Course

The introduction of a Supervisor Course last year proved very popular and a further course was held earlier this month. Dates for future courses will be advertised on the website, from where an application form can be downloaded (www.icats-training.org). Eligibility for the course is as follows:

1. Any applicator who has two years’ experience following successful completion of the mandatory ICA ICATS module.
2. Supervisors and Technical Managers who have more than two years’ experience in the industrial coating field with supporting evidence from their employer; even if they have not completed the ICA course.
3. Other candidates (from non ICATS registered companies) with at least five years’ verifiable experience in the coating industry will also be eligible.

Eligibility for Training

It is in all our interests to ensure the ICATS protocol is being adhered to, so that we are able to demonstrate to the asset owner that the programme is a benefit to them. We are planning to audit the process and look forward to your assistance in executing this. Except at Approved ICATS Registered Training Providers, all applicators being registered for ICATS training must be a genuine employee of the company that registers them. We will be auditing all companies certifying applicators and if this process reveals personnel have been certified and are not employed by the company that provided the ICATS training, the registration will be cancelled.

Approved ICATS Registered Training Providers are listed on our website, where you can also keep up to date with ICATS news.

Presentation to the Yacht Designers and Surveyors Association

The professional Yacht Designers and Surveyors Association (YDSA) contacted the Institute, via the Northampton office, requesting us to present a one day informative course on corrosion of steel hulled craft in fresh water service. This task fell to past President Trevor Osborne as being the most suitable on the basis that he was after all a small craft owner, albeit one with a plastic non corrodlable hull. The presentation took place on March 1st at the Aqueduct Marina, Church Minshull near Nantwich on the Shropshire Union Canal.

In spite of the poor weather and driving conditions, the number of attendees exceeded twenty persons, all experienced and active members of the YDSA from around the UK. The ICorr presentation covered multiple subjects all related to corrosion of small craft and narrow boats operating in fresh water, including pitting corrosion, crevice corrosion, galvanic corrosion, coatings and painting, cathodic protection, electrical isolation by decoupling of a.c. grounding and other subjects, some of which emerged on an ad hoc impromptu basis and were an aside to the prepared presentation.

The material presented was prepared to provide a greater background understanding of issues related to corrosion in the day to day work that YDSA members do while surveying narrow boats and other craft around the UK, and overseas. The issue of corrosion in pleasure and working boats is an important one and the YDSA are very active in investigative surveying. From post event feed-back it was clear that all who attended found the presentation and group discussion most useful, and that the learning outcomes will be put to good use in carrying out future surveys and preparing reports.

This was a long day, but a very worthwhile one spent in the company of a well experienced and professional audience. ICorr look forward to again meeting with the YDSA to further their understanding of corrosion and our understanding of pleasure boats and related surveying practices.
A collection of recently edited and up-dated technical guidance documents from the CED Coatings group has recently been published in the member's area of the Institute of Corrosion website. Each document includes extensive referencing to relevant standards and other sources of information. A summary of these documents is presented here. Please note that to access the members area you will need to register or re-register by filling in the on-line form at https://www.icorr.org/members-area.

CED/CT01 Inspection and testing - Surface preparation and organic coating-related inspections
This document discusses the purpose of inspection, the specific areas that a paint inspector might check, the relevant standards and methodologies, the reasons behind the various requirements, and the equipment used. Subject areas include: pre-coating (visual inspection, surface profile checks, extraction of soluble salts, surface cleanliness checks, ambient monitoring) and post-coating (coating thickness checks, adhesion testing, holiday detection). The focus is on those methods which are considered the best, or most commonly used, but an emerging test for post-coating corrosion protection monitoring, namely electrochemical noise measurement, is included as an Appendix.

CED/CT02 Surface Preparation Methods
CT2 provides an insight into the types of preparation methods that are available, the equipment used and how this is related to industry standards. The three common surface preparation methods, i.e. abrasive blasting, hand and power tool, and water jetting, are discussed, with particular attention given to water jetting, which is less well-known than the others. The advantages and disadvantages of each method are also highlighted.

CED/CT03 Organic coating application methods
This document provides an insight into the available coating application methods and the equipment used. The various application methods described are: brush application, roller application, spray application (including air-, airless-, HPLV-spraying, auto-deposition, and rotating discs and bells), dip coating and flow coating.

CED/CT04 Paint: a definition and generic organic coating types
This document provides an insight into the generic organic coating types that are available, highlighting the types and compositions of the coatings. It begins with a brief definition of what comprises a paint system and an outline of why, when and where anticorrosive paint is used. It provides definitions of resins (e.g. alkyd, epoxy, polyurethane/ acrylic urethane, vinyl esters, and silicone-based resin systems), pigments and extenders, solvents, additives (driers, thixotropes, UV absorbers, de-foamers, wetting agents). Some examples of complete paint systems (primer, stripe coat, intermediate coat or coats, and finish coat) are also given.

CED/CT05 TMS: Thermal metal spray
CT05 defines the technique of thermal metal spraying, placing it in context and noting the relevant surface preparation standards. The methodology is then described in detail, including flame spray and arc spray. Properties such as abrasion resistance, galvanic protection, longevity and the permeability of thermal metal spray to water are discussed. This is followed by a section covering the appropriate uses of TMS, as well as noting where it is NOT recommended.

CED/CT06 On-site and off-site application of intumescent fire and corrosion protection coatings for steel structures
This document provides a definition of intumescent coatings and highlights the key issues concerning specification and use of the types of coating appropriate in particular contexts. It also covers, certification, development and handling of the coating, and preparation of the substrate surface, together with the advantages and disadvantages of off-site or on-site application. An emphasis on the corrosion protection aspects of the intumescent system, and information on the types of system that will be effective in this context, are included in the sub-section on environment. A large number of sources of further information are included towards the end.

Corrosion Engineering Division
The conference and associated exhibition will cover recent research and experience related to corrosion and protection of internals and externals of pipes and pipelines in the drinking water, waste water and oil and gas industries.

CEOCOR Congress 15 - 18 May 2018, Crowne Plaza Hotel, Stratford upon Avon
The full Programme for this event can now be found on the congress website, http://www.ceocor2018.com, as are a registration booking form, and hotel contact details.

If you are involved in pipeline corrosion this is a must attend event. Registrations are already at 70% of capacity. Have you booked yet?
Quality Assurance
(D HARVEY)

The Institute of Corrosion has always understood the importance of providing a high quality of service to its members and clients, and has therefore embarked on setting up a Quality Management System fully complying with ISO 9001:2015. This was also a requirement by Highways England regarding ICATs approvals (Correx are also separately accredited to this standard for ICATS).

Our Quality System has been audited by LRQA and is now accredited with meeting the requirements of the ISO 9001:2015 Standard as shown on the certificate. The QMS will be audited both internally and externally to ensure ongoing compliance with the Quality System and continuous improvement of our system.

London Branch

The February talk was on the use of Electrochemical Impedance Spectroscopy (EIS) as a predictive tool for coating lifetime, and was given by Dustin Traylor, Global Product Manager of Axalta Coatings Systems. This was an excellent presentation which produced significant discussion amongst those attending. The concept was to raise awareness of new predictive modelling techniques for coating life and performance. A new generation of high temperature coatings, in particular high glass transition temperature Fusion Bonded Epoxy (with a Tg of 205 C), are being developed as a lower cost alternative to expensive alloy steels. However, the highly-functional epoxy resin and ingredients in these new coatings can make interpretation of testing results difficult for coating specifiers. Dustin explored the benefits of using EIS after atmospheric testing to assess a coating’s life expectancy. The conclusion was that EIS did have a part to play in conjunction with accelerated weathering. Autoclave and Atlas Cell tests, to assist in the determination of expected coating life. This technique has now been adopted by Aramco and Chevron and is gaining credibility as a useful tool in the pipeline market.

The branch AGM was held ahead of the March evening technical meeting, at which David Mobbs (Chair) delivered a short presentation on the achievements of the branch over the past year, including confirming that the move to Imperial College had increased attendance from 20-30 to 40-50 per meeting, and that our finances were good. He outlined the steps being taken to obtain speakers to present new technology, new ideas and having more technical content, and noted that the membership affiliated to the branch amounts to 45% of Institute members, and 22 members qualified for 20 or 30 years long service pins. He finished by thanking everyone for their support, and the speakers and committee members who give up their time voluntarily to make it all work.

Mark Stone of Sonomatic Ltd then gave a presentation on the technology advancements in integrity management of storage tanks. The industry is well versed with non-intrusive inspection of vessels and pipework, but corrosion mapping of storage tanks has always relied on man entry and physical base plate inspection. However, the industry does not like working in confined spaces and there are moves towards zero-man entry over the lifetime of storage and process vessels. Mark explained that tank inspection plays a major role in effective integrity management of storage tanks, which historically has relied on emptying the tank and personnel entry for cleaning and inspection, and that the common method of using Magnetic Flux Leakage testing is not necessarily the most effective method of determining metal loss. Sonomatic have developed a range of methods for inspection of these tanks while in-service, which included the use of traditional shell wall inspection using crawlers, coupled with a new technology to determine metal loss of the tank shell using multi skip technology deployed around the outer chine of the tank.

The key element of this testing programme is the use of robotic cleaning and inspection of the floor - the tool is dropped through the tank fluids to the floor and remotely guided by use of sonar. Firstly the level of sludge is determined, and then the tool removes this and scans the base plates, the results of which are transmitted to a mobile unit outside the tank where a statistical analysis is carried out. The presentation included a case study of a field application.

This was an excellent presentation and there was a high level of discussion around the floor. The chairman’s opinion was that the real value of this testing procedure was that it was an ‘iterative process’, whereby a tank farm operator could screen all the tanks and identify which were detected as the worst. On opening the tank and carrying out full base plate inspection it would be possible to check the model to see how accurate it was, and by the time the third tank had completed its full inspection, the model would be pretty accurate, and could be used in future with more certainty.

BRANCH NEWS

The local branches allow members (and non-members) to meet and network with others in the industry. They are a good way of staying up to date and learning about the latest developments from experts. It should be remembered that attendance at all normal branch evening events is free and CPD Certification, which is a requirement for becoming a chartered engineer or scientist, is provided by some branches.

NEW SUSTAINING MEMBER

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Cescor UK, an independent specialist engineering company, delivers the full spectrum of materials and corrosion engineering, cathodic protection and integrity management services to the oil, gas, renewables, petrochemical and utilities industries globally, and provides clients and partners with right-first-time, cost-effective support for all their engineering design and operational asset care requirements. Their expertise encompasses structures, jetties, marine terminals, processing, production and storage facilities, high pressure, high temperature oil and gas pipelines both onshore and subsea, and they can help clients optimise lifecycle asset performance.

Cescor UK Limited builds on the heritage of its parent company, Cescor srl in Milan, who have an extensive project portfolio of long-standing and successful relationships developed over 25 years at the forefront of the Oil and Gas and Energy industries. As a successful, technically-focused and fully commercial business with close and enduring links to the science and research base, Cescor engineers are ideally paced to help business address the unmet needs and complex challenges associated with ensuring safe supply of the world’s energy.

Mark Stone of Sonomatic.

Cescor UK Ltd

www.icorr.org  March/April 2018    7
The branch kicked off 2018 with 3 well attended events with an average attendance of over 60 people, beginning with a special cathodic protection evening on the 30th of January. In the first of two presentations, Edgar Rodrigues of TAQA gave an excellent talk on “Impressed Current Cathodic Protection Retrofit Strategy in the North Sea”.

TAQA’s fixed drilling and production installation was installed in the North Sea in 1980 in 161 metres water depth approximately 110 miles north-east of Lerwick in the Shetlands. The platform jacket has 8 legs and was installed with traditional stand-off galvanic anodes, but its sacrificial CP System is now beyond its original design life. Surveys from 2010 to 2013 indicated a reduction in corrosion protection from the CP system, and plans were implemented to upgrade this. A remote impressed current CP (ICCP) anode sled system was selected, installed and commissioned in early 2016. This presentation discussed the CP design process and the many challenges in choosing what was at the time, the largest ever CP retrofit, both in terms of delivered current capacity offshore, and the CP current demand of the structure required to maintain external corrosion protection. All retrofit CP systems however require regular CP data to validate CP performance and this can often be erratic and costly to obtain, typically involving ROVs, as was discussed in the second presentation of the evening.

Andy Smerdon of Aquatec Group continued the evening with a very interesting and complimentary presentation on “Retrofit CP Monitoring to Reduce Inspection Frequency”. Aquatec was founded by the current managing director in 1990 as a specialist consultancy in oceanographic instrumentation design. This presentation described a CP toolbox within a UK North Sea case study, comprising monitoring and communications modules that were used to provide high quality CP potential and CP current data sets, accessed remotely from diving vessels and platforms. The cost of CP monitoring equipment when simultaneously installed with retrofit CP systems, is relatively low and normally recovered by dispensing with just one conventional subsea inspection campaign, in favour of remotely retrieved data.

The branch’s second event in January, took place at the School of Mechanical Engineering at Aberdeen University, where a Corrosion Awareness training session was held. In the packed two hour event, there were 6 presentations covering corrosion theory and failure mechanisms, principles of corrosion management, materials and coatings selection, risk based inspection, cathodic protection, chemical and corrosion monitoring, all of which prompted a number of interesting questions from the enthusiastic audience.

In recent years, ICORR Aberdeen has established a strong working relationship with the Aberdeen branch of IMECHE and in particularly its Young Engineer Panel, and a further more extensive Corrosion Awareness event will follow in August 2018, details will be announced in the May/June magazine, and on the branch website.
NACE Basic Corrosion Course, 21-25 May 2018

This starter course for anyone in the corrosion industry covers the causes of corrosion, as well as how to identify, monitor, and control it. Completing this course will show employers you have a strong understanding of the basics, and have taken the first step in working towards becoming NACE certified.

The course covers, economic, environmental, and safety impact; basic electrochemical terms and processes; forms and causes of corrosion and concepts; how to identify, inspect, monitor; and control; and types of metals, non-metals, composites, concrete, and ceramics.

The course will be held at INTECSEA - 102 Lower Guildford Road, Knaphill, Woking, UK.

A complete course description can be found at nace.org/courses, or contact, Tasos Kostrivas (tasos.kostrivas@intecsea.com) or Raju Narayan (rajunarayan@cathodicprotector.com).

Cementitious coating passes 29-year test

According to the company, Flexcrete’s Coating 851 has been confirmed by scientists at the Vinci Construction Technology Centre in Bedfordshire, as providing an effective barrier to chlorides for at least 29 years.

Chloride-affected concrete and a typical application for Cementitious Coating 851.

In 1988, a 2mm thick film of the coating was applied to a concrete sample and sealed in a chloride ion diffusion cell. Independent tests carried out by the Vinci lab show that the barrier properties had not changed after 29 years.

Vinci’s testing can determine a chloride ion diffusion coefficient from non-steady state conditions, and based on the total chloride quantity that has been determined to diffuse through the coating during 29 years on test, it has been calculated that this equates to a chloride ion diffusion coefficient of $1.23 \times 10^{-12} \text{ cm}^2/\text{s}$. By comparison for an uncoated reference concrete specimen, a chloride ion diffusion coefficient of $1.03 \times 10^{-8} \text{ cm}^2/\text{s}$ was calculated based on the total chloride quantity that had diffused in the first 98 days on test when steady state was achieved. In other words, it would have taken 271 years for the Cementitious Coating 851 to reach the same chloride concentration that the uncoated specimen reached in just 98 days.
Despite most traffic using the Queensferry Crossing, the older Forth Road Bridge, located on the Firth of Forth, will be getting its first full paint job since the span opened in 1964. Transport Scotland recently revealed that a trial was currently under development to paint the bridge’s main truss deck. The £65 M paint job is planned to take 10 years to complete.

“The main truss deck has never been painted since the time of its construction completion in 1964,” said Michelle Rennie, major transport infrastructure projects director at Transport Scotland. Even though there have been regular patch repairs, Rennie added that “an extensive program of major painting and steelwork repair and refurbishment works are required to the exposed areas of steel”.

As reported in the last issue of Corrosion Management, a contract has also been awarded to replace the bridge’s main expansion joints this year, with a completion date set for 2019. Other work will also include resurfacing and waterproofing.

The CROWN Project’s goals, funded by the British government entity Innovate UK, include demonstrating that a 25-year service life is still possible for wind turbines even with a TSA coating that has been mechanically damaged, and numerical design and TSA lifecycle cost modelling. According to TWI, the Institute has dedicated laboratories for electrochemical and direct exposure small scale tests, as well as larger facilities for testing specimens under load in sweet conditions and seawater, the latter of which includes cathodic protection. The key project outcomes were presented at the 4th International Conference on Corrosion Protection for Offshore Wind in Bremen in March.

New research out of the Netherlands indicates that the use of biodiesel as a component in diesel fuel blends could be leading to increased corrosion in underground storage tanks that hold the fuel.

A preliminary report from SIKB, a public-private organization that works on soil issues in the country, asserts that the addition of biodiesel (derived from plant and animal fats, such as recycled cooking oil) to traditional diesel, which became mandatory in the Netherlands in 2007, has led to increased corrosion rates in USTs.

According to SIKB, bacteria in the biodiesel is the likely cause leading to the increased corrosion rate, as sulphur in diesel fuel previously slowed bacteria growth, but more recently this has been removed, allowing for more microbial growth. The research involved a review of 1,400 tank inspection reports from previous years and SIKB intends to carry out 30 new tanks before issuing a final report on the matter later this year.

Increased corrosion in diesel USTs has been noted in the United States in recent years and EPA research has shown the vast majority of diesel USTs studied exhibited moderate to severe corrosion.

Authors wishing to present their scientific and technical results are asked to submit a one-page abstract by 13 April 2018 via file upload at www.dechema.de/efcws2018. Further information can be obtained from the organiser, Dr. Rolf Lenke, email: lenke@dechema.de

EFC Workshop, High temperature corrosion under complex conditions, deposits and salts: towards green energy. DECHHEMA Haus, Frankfurt, Germany, 26-28 September 2018.

The workshop aims to bring together experts and young scientists with research interests in the high temperature corrosion of metallic materials and coatings in existing and emerging applications for greener energy conversion and transportation. The topics for oral and poster presentations may address but are not limited to experimental evaluation of corrosion kinetics, mechanistic understanding and modelling of corrosion processes and related degradation of material microstructures, using advanced analytical techniques for elucidating the complex corrosion phenomena including those induced by deposits and salts.

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

This comprehensive handbook by Hans-Joachim Streitberger and Artur Goldschmidt, is now available in its 3rd edition. The BASF Handbook covers the entire spectrum from coatings formulation and relevant production processes through to practical application aspects. It covers the industry's various sectors, placing special emphasis on automotive coating and industrial coating in general. This new edition has been completely updated, and features new sections on nano-products, low-emissions, bio-based materials, wind turbine coatings, and smart coatings.


The NACE Protective Coating User’s Handbook explains the selection and use of protective coatings in both new construction and maintenance to meet the everyday needs of demands of engineers, sales executives and contractors involved with protective coatings. The book’s author, Louis Vincent, uses everyday language rather than complex chemical terms and is intended to be a practical presentation of the basics of corrosion prevention through the use of protective coatings. The author’s research into 84 failure cases provides extensive information about the causes of coating failures — from blister failures to solvent entrapment and discontinuities in coating films. The book also contains historical data and case studies from research involving coating and lining failures, materials selection and application methods for protective coatings.

Vincent has had a five-decade-long protective coatings career which has included work in manufacturing, sales, technical service and failure analysis. He is a NACE past president and has held executive positions with several international coatings manufacturers.

The Protective Coating User's Handbook is available in paperback or as a downloadable e-book from, nace.org/store.

This specifies laboratory test methods and test conditions for the assessment of paint systems for the corrosion protection of carbon steel structures. The test results are intended to be considered as an aid in the selection of suitable paint systems and not as exact information for determining durability. The standard covers protective paint systems designed for application to uncoated steel, hot dip galvanized steel and steel surfaces with thermal-sprayed metallic coating.

EN ISO 12944-9:2018 Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures. This covers the performance requirements for protective paint systems for offshore and related structures (i.e. those exposed to the marine atmosphere, as well as those immersed in sea or brackish water). Such structures are exposed to environments of corrosivity category CX (offshore) and immersion category Im4. The standard describes paint systems for high durability but is not applicable to surfaces under insulation or concrete.

EN ISO 2819:2018 Metallic coatings on metallic substrates - Electrodeposited and chemically deposited coatings - Review of methods available for testing adhesion. The standard specifies methods of checking the adhesion of electrodeposited and chemically deposited coatings. It is limited to tests of a qualitative nature.

Continued from page 11

products to conditions of condensation in accordance with the requirements of coating or product specifications. The method is applicable to coatings, both on porous substrates such as wood, plaster and plasterboard and on non-porous substrates such as metal. It provides an indication of the performance likely to be obtained under severe conditions of exposure where continuous condensation occurs on the surface. The procedure can reveal failures of the coating (including blistering, staining, softening, wrinkling and embrittlement) and deterioration of the substrate. Supersedes the 2001 standard


The standard specifies the general conditions and procedures which need to be observed when testing coated test specimens in constant condensation/water atmospheres or in alternating condensation/water atmospheres, in order to ensure that the results of tests carried out in different laboratories are reproducible. Supersedes the 2005 standard

SSPC

The new SSPC-Guide 24 describes soluble salt testing procedures for new and shop-coated steel. It covers testing frequency and locations on new steel surface and offers guidance on where and how frequently to test for salts on steel that has been either previously uncoated or was shop-coated, and requires further coating in the field. The new guide is meant to help owners, specifiers, inspectors and contractors determine logical locations for testing such steel surfaces.

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For more information contact Jonathan Phillips on 0114 273 0132 or email jonathan@squareone.co.uk
Stress Concentration Tomography. A new tool to remotely monitor pipeline wall condition, depth of cover and stress, concurrently

Hamed Habibi, Speir Hunter, UK.

For many years, integrity solutions were based on the geometry of defects, as almost all conventional methods of inspection were only able to measure the size of the defect. There were also different techniques developed for each defect category. What causes the problem for the integrity managers is, however, stress in a part that reaches its maximum material strength and then fails. Many experiments and studies have been carried out to take the size, type, and position of defects, operating condition of the part, and many other factors into account, when an integrity decision has to be made. These techniques are normally very conservative and therefore not very efficient, even if only one inspection method can cover all types of defects. Speir Hunter has focused on an innovate approach to directly assess the integrity condition of pipelines, regardless of any other factors, including type of defect and operating condition. This method of inspection is now known internationally as Stress Concentration Tomography (SCT), and this article describes the principles in more detail, and gives some examples of its use.

Background
The science of stress-magnetisation, which is also known as Inverse-Magnetostriction, in steel was little known until Speir Hunter initiated and funded a research project jointly conducted with the University of Leeds. National Grid also invested in latter phases of the project. Magnetostriction was
Characteristics of Stress Concentration Tomography

The other terms used for SCT are, Large Standoff Magnetometry (LSM), or more generally Remote Magnetometry. Advantages of SCT as an inspection tool are: it is a remote inspection technology that requires no contact with the target, nor the input of energy into it. It can detect a phenomenon that is occurring naturally and therefore detects all causes of increased localisation stress from corrosion, cracks, lack of penetration in welds, stress corrosion cracking through to twisting and bending caused by earth movement. Because it is a remote inspection technique, there are no limitations due to the pipeline build configurations, no required change in operational conditions, and therefore no hidden costs.

Detecting magnetic signatures was one of the main challenges, but understanding them was even more challenging when developing SCT. In the absence of scientific papers acknowledging the existence of, and documenting the behaviour of stress magnetisation, a means of detecting and storing magnetic signals generated by defects needed to be designed, and then the data collected had to be understood and interpreted. Speir Hunter and their team have been successful in both challenges. To collect the data, a tool consisting of a scanner bar and a survey-grade positioning system was designed which is capable of stamping accurate geo-coordinates onto recorded magnetic and other sensor’s data.

Knowing the mathematical relationship between magnetic signatures and their source, the existence and position of pipe wall defects to centimetre accuracy can be predicted. The magnitude of localised stress within the defect can be estimated to 25MPa accuracy regardless of its source, thus a stress profile of the pipeline wall can be produced. SCT can also detect and identify the location of girth welds, beginning and end of casings, wall thickness changes, diameter changes and wrinkle bends, again all to centimetre accuracy. It can also detect the location of stuck inspection pigs, but perhaps its most unique capability is the 3-dimensional mapping of a pipeline route using magnetic data that includes depth of cover, terrain altitude and accurate pipeline route.

In the following sections, some field verifications of SCT results are presented. They are examples of a few of the types of defects among the many, that have been successfully detected by SCT.

Corrosion and Metal Loss

Metal Loss is the most common defect causing problems for pipelines, and corrosion is known to be the source of many of them (metal loss could also happen due to mechanical damages or construction issues). A reduction in pipeline wall thickness will increase the density of stress flow lines around the area and cause stress concentration. For a pipe under operating pressure, circumferential stress is normally the most dominant stress and the stress concentration is more likely to increase in the same direction.

In this example, a pipeline that had been inspected in 2009 and its several defects repaired, was selected as a trial. The inspection was repeated in 2015 by the Magnetic Flux Leakage (MFL) method focusing on metal loss types of defect by an In-Line-Inspection (ILI) tool, and two spots were identified for individual costly repairs based on having lost around 20% of wall thickness.

An SCT scan was carried out following the repeated ILI run in 2015 on a 500m stretch of the line without knowing the location of these defects. One of the defects matched the defect reported by SCT to have the highest stress level along the survey length, while the other one was estimated to have a much lower stress level, despite having a similar pit depth to the first one. The SCT indication was only 15cm away from the actual defect and Figure 2 shows the actual defect exposed in 2015. The SCT report in 2015 showed that the worst defect had a stress level of 67% of the Specific Minimum Yield Strength (SMYS) of the material, while ILI reported a 26% wall thickness loss.

The second defect was reported by ILI to have lost 19% of wall thickness, while SCT reported a much lower localised stress of 30% of SMYS. After an expensive excavation to expose the
second spot, it was found that it had been repaired following the 2009 inspection by blasting and smoothing the surface, because it had just below 20% wall thickness loss which was the threshold then for taking action for repair. Although the depth of metal loss was still at 19% of wall thickness, smoothing the surface had relieved the localised stress and SCT could see a much lower stress level compared to the first one. A stress monitoring approach could have saved the budget of the second excavation by enhancing the conventional criteria which were based on defect geometry alone.

Verifying the accuracy of a reported stress level is hard to achieve in real world conditions, but after exposure of the defects, their dimensions could be precisely recorded and a three dimensional geometry model was developed based on that to calculate the localised stress at the defects under the same operating condition at the time of inspection. Calculations were carried out using Finite Element Analysis and the derived results closely matched the stress levels reported by SCT.

Cracks and Stress Corrosion Cracking

A further unique feature of SCT is its ability to detect cracks at even the micro-crack stage prior to serious damage being caused to the pipeline. In this example the cracks detected were shallow and the pipeline was repaired simply by grinding out the cracks before any serious damage had occurred. Two exposed defects were within 100m of one another. One at micro-crack stage with the maximum length of 10mm and the other had some longitudinal long cracking of around 140mm. SCT reported SCZs at these two points to have around 68% of SMYS. These two defects can be seen in Figures 3 and 4.

External Loads

Another advantage of monitoring stress in pipe walls instead of geometry change is that any external load that exerts localised stress on the pipe could be detected (however, SCT cannot identify the source of stress concentration). Another capability of this technique becomes beneficial in this situation. For example, accurate pipeline route and measurement of depth of cover reported by SCT scan helped to see a deflection in a pipeline route from a straight line and local change in depth of cover, that suggested the pipe had suffered from a landslip and upward buckling in the same area that SCT reported a few SCZs with noticeably higher stress levels. Figure 5 illustrates a top view of this lateral deflection.

Defects at Welds

SCT is also capable of not only identifying the location of girth welds but also of detecting if there are weld defects and/or corrosion close to, or on the weld. In this example, a mis-match at the weld caused a leakage of water under the coating resulting in an area of external corrosion pitting of 638mm by 180mm, with a maximum depth of 8% of wall thickness. The wall thickness change was along the girth weld and caused denting at the
other side of the pipe in order to force the alignment. Figure 6 shows the mis-match at a 12 o’clock position while Figure 7 shows the dent at about the 10 o’clock position. The mis-match and the dent, led to water getting under the coating and causing the pitting.

**Conclusion**

Monitoring stress has many advantages over conventional and traditional methods of inspecting defects. It can lead to a more accurate assessment of the defect in terms of severity. The existence and location of these defects can now be identified through an automated algorithmic analysis of magnetic data collected by using UNISCAN™ patented hardware. Some examples of the defects that have been successfully detected by this technique have been discussed. It has taken 6 years to reach this stage of development and SCT is now being deployed commercially as a complementary tool to DCVG, as an additional tool in the external corrosion direct assessment armoury, as a screening tool to guide the deployment of established high resolution tools, to guide excavation teams to accurate dig locations and as a stand alone tool to detect stuck inspection pigs. It can also be used to map pipeline routes and features e.g. casings, wall thickness changes, and to assess potential threats to pipelines in geohazardous locations. It can also be deployed as a tool to monitor depth of cover trends in areas of known soil erosion. The need for taking a conservative statistical approach to estimate the degree of danger of defects under operating conditions can be eliminated by using SCT, which directly assesses stress levels. In situations where no single conventional method can measure the geometry of a defect, such as when there is a combination of cracking and corrosion, the advantages of this technique become clear.

There are still further steps left to produce an international recommended code of practice for the use of SCT results directly in integrity programmes. Until then, companies can set their own rules by trialing this technique, or by utilising SCT as a complementary tool to prioritise their maintenance schedule, or increase the effectiveness of their maintenance budget.

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Choosing the right solution for offshore windfarms

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With traditional onshore wind markets facing challenging times, it is encouraging to learn that there are now 92 offshore wind farms (including sites that are partially grid-connected) in 11 European countries. 2017 saw a record 3,150 Megawatt (MW) of net additional capacity installed in Europe alone, corresponding to 560 new offshore wind turbines across 17 farms.

This positive growth in the European offshore sector has been driven by falling costs alongside advancements and innovation in cost-out measures - achieved through a greater understanding of the key risks in offshore wind tower construction, larger projects leading to greater economies of scale and an oversupply in the wind turbine market. Offshore wind energy is projected to become Europe’s fastest growing renewable source.

The rise in offshore wind energy has spurred a similar growth in related protective coatings. Although the offshore wind industry is known to be generally conservative, its search for cost savings has encouraged a coatings manufacturer to research and develop new and innovative coatings that can be applied more quickly, and which offer optimum protection.

Above and below the waterline coatings

Offshore wind farms undoubtedly face some of the most severe operational and environmental conditions on our planet, constantly exposed to a corrosive marine atmosphere. Due to their location, these structures are often hard to access and so maintenance and re-coating a structure in situ can be extremely challenging and costly. Therefore it is vital to select the optimum coating first time.

Having worked with the wind energy industry since its early development, we at Hempel understand that asset owners want to invest in a coating that reduces both risk and total cost of ownership (lower cost per kilowatt hour), and which ensures prolonged service life with little or no maintenance.
Experience shows that to achieve maximum protection, wind farm tower foundations have been coated with a heavy-duty epoxy paint system, and the tower structure itself with a zinc-epoxy three-coat system.

A recent inspection was carried out of the Thunoe Knob wind farm offshore Aarhus in Denmark, one of the world's longest serving installations. Four of the ten turbines were chosen at random and evaluated through visual examination, photographic documentation and dry film measurement. Despite being more than 20 years old, the inspection found that both the interior and exterior coating systems were in good condition and could be expected to remain so for at least another 10 years, demonstrating a practical coating lifetime of more than 30 years. In the same year, the Horns Rev 1 wind farm, located in the North Sea off the Danish city of Esbjerg, was also inspected. In this hostile area, the environment has been classified, under the ISO 12044-part 2 standard, as C5M – a very highly corrosive marine environment with high salinity. Once again four wind turbines were chosen at random and evaluated. The exterior and interior coated surfaces again were found to be in prime condition, and from the overall results it was estimated that the coating system would have a service life of at least 27 years in this environment.

Typical 3-coat systems to deliver protection in the tough environment of offshore wind farms encompass a zinc rich epoxy primer at 60-80 micron dft, a two-component polyamide adduct cured, high solids, high build epoxy intermediate at 140-180 micron dft, followed by a two-component acrylic polyurethane topcoat, cured with aliphatic isocyanate at at 60-80 micron dft. This is solid way to protect a wind tower, and has been tried and trusted method for many decades.

This article describes an innovative technology that has been developed to deliver improved corrosion resistance throughout the total lifetime of a turbine tower and meeting the operator’s precise requirements.

Innovative technology
Zinc-rich primers have been used for many years, and are an established method of corrosion protection for steel.
These systems use high levels of zinc dust as a pigment in an organic binder (epoxy) or inorganic binder (silicates) to create a galvanic effect that protects the underlying steel substrate from corrosion. The zinc particles are more active than steel and act as ‘anodes’ in the coating and corrode instead of the steel when exposed to water, oxygen, and/or chlorides.

As described above, zinc-rich based coatings systems are ideal for protecting wind towers, and organic zinc-rich primers are often preferred over inorganic zinc-rich primers, as they are less sensitive to surface preparation, over application, and humidity, making application easier.

Research started in 2007 to examine ways to improve the effectiveness of conventional zinc-rich epoxy coatings, made an important discovery. While a typical conventional organic zinc-rich epoxy coating contains ~80 wt per cent...
zinc, just one-third of the zinc actually contributes to corrosion protection. The research showed that only the zinc located in the 20 to 30 μm closest to the steel was consumed by the galvanic reaction in a zinc-rich coating with a dry film thickness (DFT) of 60 to 80 μm. Hence about 60 per cent of the zinc added to the primer was not used in the galvanic reaction. This led to the development of the activated zinc-rich epoxy primer coating technology– that incorporated tiny hollow glass spheres (~40 µm in size) and a special proprietary additive – an “activator”. Because of the synergy of these components, the coating delivers three methods of corrosion protection: a galvanic effect, a barrier effect, and an inhibitor effect.

For galvanic protection, the activator increases the zinc’s ability to carry the corrosion current throughout the coating even if the zinc particles are not in direct contact with each other; which greatly improves the cathodic protection (CP) of the steel. The corrosion product of the zinc delivers the coating’s barrier properties and self-healing characteristics. Typically the corrosion product of a zinc-rich primer is zinc oxide. In the activated zinc-rich primer the corrosion product created a more insoluble salt - zinc chloride hydroxide hydrate. This insoluble salt forms a uniform protective layer on the surface of the primer, which acts as a barrier that blocks water, oxygen, and chlorides from reaching the steel surface. Additionally, by-products from the rapidly corroding activated zinc fill any cracks caused by mechanical damage in the coating, essentially enabling the coating to heal itself.

The addition of the hollow glass spheres enhances the coating’s physical properties. The spheres improve the film's crack resistance by blocking the propagation of micro-cracks, they also contribute to the coating’s low permeability. Additionally, the glass spheres are important contributors to the coating’s inhibitor effect. An accumulation of insoluble complexes of zinc, oxygen, and chlorides on the surface of the glass spheres become part of the coating instead of reaching the steel substrate. The zinc corrosion product created during galvanic corrosion also acts as an environmental scavenger by capturing chloride ions as they diffuse into the coating from the environment. This is the inhibitor effect, the third type of protection offered by the innovative coating.

The superior anti-corrosion performance, compared to conventional zinc epoxies, can be seen in figure 1 after salt spray testing (ISO 12944-6), as well as reduced rust creep and better protection in cyclic corrosion testing (ISO 20340) and NORSOK M501 Revision 6 (figure 2).

The innovative epoxy technology has been designed to release the internal stresses of continual expansion and contraction of the metal surface and the coating. This low cracking tendency can be seen from the results of the NACE cracking test and our in-house welding test at various film thicknesses (figure 3).

**Beyond science – efficiency gains**

Together with the need for superior protection, wind farm operators are increasingly demanding more efficient coating systems that are easy to apply, saving time and money. This innovative zinc-rich based coating, for example, may be applied at high temperatures and humidity levels without blistering, and with a re-coat interval of one hour at 20°C it is 50 per cent quicker to dry than most zinc rich epoxy primers at similar temperatures. Its high dry film thickness also means that it is less susceptible to cracking.

**Conclusion**

As can be seen, the right choice of coating for a wind tower is a high performing coating that can protect the structure for its entire service life, with minimal or zero maintenance. New and innovative paint technologies, are able to deliver on this requirement, and it is essential that operators take the time to invest in reliable and robust protection for their assets.
Internal Corrosion Protection for Oil Field Process Vessels

Crude oil processing vessels can experience severe corrosion risks from the liquid and gas components of the oil produced. This can include produced water, H₂S, CO₂, high temperatures and pressures and scouring from entrained solids. These vessels are traditionally made from mild steel, and must be protected internally with a corrosion resistant liner. The water co-produced with the crude oil must be separated out then treated before disposal, the costs for which are increasing due to more stringent environmental regulations. To increase production from mature oil fields, water is re-injected into the well (Enhanced Oil Recovery), and a more economical way of disposing of the produced water is to use this for the re-injection, although some treatment must still take place.

The 5th largest oilfield globally (and No.1 in Iraq), located in Southern Iraq near the Kuwaiti border, is a mature field where the operators wanted to increase production by end of 2019, and therefore started a produced water re-injection project in 2011. This consisted of pump stations and a processing complex, which comprises the gas/oil/condensate/water separation facilities and also the water re-injection treatment plant. A total of 40 new process vessels (10 desalters, 10 dehydrators and 20 degassers) were required. These were to be produced from carbon steel and initially a nickel/chromium/molybdenum alloy (625) cladding was considered for internal corrosion protection, which is a common solution to the problem. However the owners wanted to reduce the capital investment expenditure, but not compromise on quality, and sought a reliable vessel lining solution, which could be delivered anywhere in the world (the vessels were being manufactured in China).

After considering the various options available including looking at the protection of existing vessels, linings from Belzona were selected as being a cost effective solution. These linings have been used in more than 1000 newbuild process vessels globally, including 143 vessels operating in oil and gas fields off the north east coast of Qatar. Based on the operating temperature and pressure of 100 °C and 15 bar, and the preferred method of application (hand apply), a 2-part ceramic filled epoxy coating, Belzona 1391T, was chosen. This solvent-free system can be applied using simple hand tools and provides erosion and corrosion resistance to high temperature equipment operating under immersion up to 130 °C. It also offers excellent resistance to a wide range of aqueous solutions, hydrocarbons and process chemicals. In addition, inserts manufactured from Belzona 111 (Super Metal) were custom-made for protection of small bore nozzles on the vessels. This solvent-free epoxy resin reinforced with silicon steel alloy does not corrode and resists a wide range of chemicals and can be machined using conventional tools.

A large project like this is a big challenge to an oil producing company, to a fabrication yard, and also to the lining manufacturer; and in this case, Belzona were selected to supply the linings due to their experience of providing turn-key solutions within the industry. They also supplied engineering knowhow and worked with the project planner to ensure the lining schedule fitted into the vessel fabrication schedule and matched the project overall delivery schedule, before the client issued the contract.

The new expanded oil processing trains were designed in 2013 and put out to bidding and commercial agreement in 2015. The first vessel was fabricated in China in September 2016 and was lined one week after the vessel completed hydrostatic testing. All the vessels were completed by end of March, 2017, shipped to Iraq arriving in May and installed on site ready for operation by end of 2017.

First the internal surfaces of the vessels were prepared by grit blasting, to Sa 3 standard (before blasting, the media to be used was checked, as were the environmental conditions). Two coats of the ceramic filled epoxy were then applied at 450-550 micron each, by trowel. Eight hours were left between coats to ensure adequate adhesion. Holiday detection was carried out on each coat and any defects repaired. Inspection was carried out at the fabrication yard by Belzona-certified NACE inspectors.

According to the supplier, the use of the epoxy coating instead of the 625 alloy helped save the client 70% of their investment costs on this project phase. In total, 25 tonnes of the ceramic.
Internal Pipeline Coating

For decades, finding a suitable solution to the difficult application of coatings to the internal surfaces of large diameter pipelines has proven to be a major problem for many contractors. Using the traditional method of surface preparation by abrasive blasting is expensive, and can have major environmental and health & safety risks. Furthermore, the application of conventional solvent-based paint systems, especially in these confined spaces with little ventilation, is an extremely hazardous process.

So when the internal surfaces of the 42” penstock serving the Storr Lochs Hydro Power Station on the Isle of Skye needed refurbishment, the owners looked for an environmentally friendly, safe and economical solution. The refurbishment project was put out to tender, and the successful contractor proposed a system from Chemco, based on the use of water jetting as an alternative surface preparation method and a solvent-free, wet & rust tolerant coating system. By using this solution, the maintenance and repair work could be undertaken in the most convenient, environmentally friendly, and safe manner, and substantial time and cost savings should also be achieved.

The Solution in Practice

The internal surface of the 770 metre long pipeline (with a total surface area of 2560 m²) needed to be refurbished as the existing bitumen coating was suffering from extensive breakdown and abrasion damage, with corrosion of the underlying steel pipeline surfaces present. There were only manholes at the end of long sections of the pipeline which could provide access and ventilation control, and one section of the pipeline was situated on a steep downward incline which added a further difficulty with access and application of the coating system. A double winch trolley system was therefore installed to support the applicator on the gradient sections of the pipeline.

High Pressure Water Jetting to WJ-3 standard was used as the surface preparation method as grit blasting was judged to be too expensive and impractical. The first sections of the pipeline (from the top loch) were done from the adjacent access road, and the inclined sections were done from a nailed bogey winched up and down the pipe. The used water was recovered from inside the pipes by gravity, and fed into filtered waste bags. The debris collected was then sent for proper disposal. The substrate was dry before the paint application, and one stripe coat of the solvent-free epoxy primer was applied to welds and areas of deep pitting followed by one coat of the primer (Epo-chem RS™ 500P) applied by airless spray, brush and roller, to 100 micron dft. A further stripe coat of the solvent-free glass flake epoxy topcoat (Epo-chem RA™ 500M) was applied followed by one full coat of the topcoat applied by airless spray after 24-48 hours to a dft of 250 micron.

According to the supplier, the applicators confirmed that substantial time and cost savings were achieved by using this solution, compared to the more conventional approach. It was also reported that the applicators were extremely satisfied working with the solvent-free coating system which had provided a safer working environment in the confined space with significantly reduced H&S and fire hazards. They added that the solution adopted had met their client’s requirements for an environmentally friendly and cost effective process.

The products applied have been successfully used for over 15 years to protect tanks and vessel internals giving maintenance-free coating performance, and up to 15-20 years guarantee depending on the application. So far there has been no evidence of any breakdown of the coating which is expected to last more than 20 years (the original bitumen coating had performed well for about 60 years).
Innovative Products

New cargo tank coating for the offshore oil & gas industry

Hempel has launched a high performance, chemical resistant, two component epoxy coating, Hempadur 15600, for the offshore industry. According to the company, this has been specifically designed for Floating Production Storage and Offloading (FPSO) cargo tank protection, and is IMO Performance Standard for Protective Coatings (PSPC) cargo oil tank compliant, and provides excellent resistance to continuous immersion in hydrocarbons, including crude oil up to 90°C.

Maurice Steijger, Group Offshore Manager, Hempel A/S, said that the coating offers the ease of application of a pure epoxy coating with the corrosion protection and temperature resistance of an epoxy phenolic coating. It is mechanically robust and can be applied in just two coats to achieve the required dry film thickness (DFT) for most cargo oil tank specifications. This enhanced performance is due to a proprietary high cross-link density technology which gives added chemical and corrosion resistance and a hard, glossy surface for easy cleaning. Application costs and risks are reduced, and the coating offers resistance to hydrocarbons, including crude oil, at temperatures up to 90°C.

Additionally, this high temperature resistance ensures excellent performance at temperatures where conventional pure and modified epoxy universal primers can display limited resistance. For shipyards, the coating offers fast drying and curing properties resulting in a hard, smooth and easy clean surface which is re-coatable after six hours, saving further time and costs during dry-docking and maintenance. It can be applied at temperatures as low as -5°C, offering more flexibility during winter working conditions, and to assist with the necessary tank inspections, the coating is available in multiple shades including light colours which are highly resilient to oil staining, permitting easier inspection and identification of defects following immersion service, concluded the company.

New high build glass flake epoxy in line with new ISO 12944 standard

AkzoNobel has launched a new high build epoxy coating containing a high level of lamellar glass flake for enhanced abrasion and corrosion protection. According to the company, Interzone 954GF extends their range of protective coatings targeted at areas including the offshore oil & gas and wind industries. It is fully approved in accordance with offshore corrosion standard NORSOK M501 Ed.6 Systems 1, 4, 7A and 7B, and meets the performance requirements of the revision of ISO 12944, which covers performance testing of Cx offshore environments. The performance testing in both these standards is currently based on the cyclic corrosion methods used of ISO 20340.

Ian Fletcher, Europe Regional Marketing Manager, said that unlike typical high build glass flake epoxy coatings, this new product utilizes high aspect ratio lamellar glass flake for extended asset lifetimes and reduced total cost of ownership.

New coating thickness gauge

Helmut Fischer GmbH has launched a new coating thickness gauge, Phascope® Paint, with a smartphone app, to complement its comprehensive range of handheld coating thickness gauges. This device will be available in the UK in the next few weeks through subsidiary company Fischer Instrumentation (GB) Ltd.

According to the supplier, the new gauge is used in conjunction with a smartphone, where an easy to use app leads the user through the calibration before analysing and displaying the data and setting tolerance limits. Data analysis is possible on the move and reports can be generated quickly and simply without the need to transfer to a computer. A photo and a description of a measured spot can be added to the report, with reports formatted as a pdf for sharing by email directly from the smartphone.

The design resembles a slim torch, the tip of which is the probe. Using the phase sensitive eddy current method, the device measures coatings on iron and non-ferrous metals at a frequency of 40 kHz. It has other characteristics such as a wide measuring range (0-3000µm), a scanning mode of up to 70 measurements per minute and coloured LEDs to show when tolerance limits are breached. The robust design has been tested with water and dust and is IP65 rated.
New Drone Thickness Gauge

Dorchester based Tritex NDT have launched a new ultrasonic metal thickness gauge specifically designed for mounting onto drones for high level inspections. According to the company, the gauge uses multiple echo to completely ignore coatings up to 20mm thick, and the single crystal probe ensures accurate readings on curved surfaces, such as storage tanks and pipelines. Remaining metal thickness and corrosion levels can be quickly and more easily checked without the need for scaffolding or rope access.

The Multigauge 6000 Drone Thickness Gauge OEM transmits real time measurements wirelessly up to a distance of 500 metres using its integrated RF transmitter. The readings are displayed and stored on dedicated Communicator software within templates in a grid or string format. The probe has Intelligent Probe Recognition (IPR), which automatically adjusts settings in the gauge when connected, resulting in a perfectly matched probe and gauge for enhanced performance. Also, the Automatic Measurement Verification System (AMVS) used with multiple echo, ensures only true measurements are displayed, even on the most heavily corroded metals, concluded the company.

New cleaner to combat winter and conditions

Cortec® Corporation has launched FlashCorr VpCI®, a highly effective, non-toxic, environmentally safe cleaner that removes and neutralizes salt build-up from any metal surface. According to the supplier, the product will greatly reduce application costs and improve adhesion thus allowing effective and long term performance of protective coating systems. The product is a blend of surfactants, chelating agents, and corrosion inhibitors, and used for removing salts from commercial and marine equipment. It contains inhibitors to protect metal parts from corrosion after cleaning salt deposits remain, and provides protection of metal surfaces from corrosion. It is non-flammable, nitrite-free, nontoxic, and does not cause disposal problems. The cleaner can be applied to abrasive blasted, water blasted, and wire brushed surfaces in order to stabilize and protect against flash-rust before application of protective coatings.
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BRANCH DATES

12th April 2018
London Branch Meeting
6:00 pm - 8:30 pm
Venue: Imperial College, Skempton Building, London SW7 2BB

24th April 2018
2018 CED Working Day Meeting
The 2018 CED working day meeting will be held at the Birchwood Park Conference Centre, Warrington, on Tuesday 24 April 2018 on the subject of ‘Atmospheric Corrosion in Industrial Applications’. An information and registration leaflet is included in this issue of Corrosion Management. For further details, see website or email admin@icorr.org

24th April 2018
Aberdeen Branch Joint meeting with MCF (Evening Session)
6:00 pm - 9:00 pm
Palm Court Hotel, 81 Seaford Road
Aberdeen, AB15 7YX, United Kingdom
Joint Meeting with MCF.
George Gair of Subsea 7: Subsea Inspection - The Future.

29th May 2018
Aberdeen Branch – Joint meeting with NACE; Industrial Visit
Industrial Visit to Sonomatic.
Presentations and Showcasing Kit and Facilities on Overcoming and Identifying Corrosion/Integrity Challenges. Visit to start from 6.30pm
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