Reader Enquiry Service

For further information on any of the products and services featured in this issue simply fill in the Reader Enquiry Service slip opposite and return to us FREEPOST (no stamp required):

Corrosion Management
FREEPOST
RSRB-JLHR-HYHX
SHEFFIELD
S1 4EL
UK

For further information on any of the items featured in this edition of Corrosion Management, please write the appropriate Reader Enquiry Service number(s) in the spaces below.

Name: __________________________ Position: __________________________
Company: __________________________
Address: __________________________
________________________________________
________________________________________
Tel: __________________________ Fax: __________________________
Email: __________________________
CONTENTS

Institute News

The President Writes 4
Midland Branch Event 4
Dr. Paul McIntyre Tribute 5-6
Professor David Scanterbury Tribute 6-7
Aberdeen Corrosion Awareness Day 8-9
Interviewing Corrosion Professionals 9-11
New Sustaining Members Profile 11
Focus On Specifiers 12-13

Technical Article

Micelle Detection for Optimising Corrosion Inhibitor Dose on an Offshore Platform 14-19

Company News

Winn & Coales (Denso) Ltd. 19-20

Sustaining Members 21-28

ICATS Registered Companies 29-31

Diary and Branch Contacts 32
The President Writes

It feels quite strange sitting here writing what will be my last “President Writes” it seems like only yesterday that I wrote my first one in a hurry after the AGM in November 2010. It has been a singular and totally unexpected honour to serve as President of ICorr and one that I have thoroughly enjoyed. As I said in that first edition, I was not up to date in the field of corrosion but I had other skills which I hoped I could contribute. I have not been called upon for much corrosion knowledge but have found that juggling (priorities) was the most important ability needed, that and remembering the copy deadline for these articles.

A lot of water has passed under the bridge in two years. The office has moved from Leighton Buzzard to Northampton, the staff are now directly employed by the Institute rather than through a management company with all that goes with that. Our accreditation to the Science Council has been re-invigorated and we now have around 30 Chartered Scientists and that number is growing. Midland Branch are now again a very energetic regional group and our AGM will be held at the end of a half day Midland Branch symposium in Birmingham on 22nd November. Plans to create some form of grouping of members in the Middle East are under consideration. We are in active discussion with other national corrosion societies about collaboration for our mutual benefit. There has been a lot of debate on the governance of the Institute and proposals will be tabled at the AGM to bring the structure of the Council up to date and streamline its operation.

ICorr training courses are very successful covering a variety of subjects delivered by CORREX, ARL and Corrodere. Work is in hand to expand the range and topics in our training portfolio. The Institutes finances are robust and we are looking to invest in the work of the Institute particularly training for the future benefit of members.

Needless to say I cannot claim responsibility for much of this. ICorr has long depended on the selfless contributions of its members to debate, discuss, create, implement and deliver and long may it remain so. Whether participating in symposia organised by the Branches and Divisions or contributing to the work of Council, PDTC, PAC or the other standing committees or the many other activities which go on almost unnoticed making up the life of ICorr. Without that contribution we are nothing. Once again I thank you for the opportunity to add to that contribution and for the friendships extended to me over the past two years.

I do not get to retire completely after the AGM I have a further two years as Immediate Past President when I shall support the new President however I can before I ride into the sunset or perhaps rust away permanently this time.

MIDLAND BRANCH ½ DAY EVENT
(PRECEDING THE ICORR AGM)
THE FUTURE OF GALVANIC ANODES?
Thursday 22nd November 2012 – 12.30 to 17.00 hrs
Followed at 17:30 by the ICorr AGM
Birmingham Council Chambers – Main Chamber – Birmingham B1 1BB
12.30 Lunch Served & Networking
13.25 Welcome
13.30 Presentation One: The Future for Sacrificial Anodes
Dr Bob Crundwell – Sacrificial Anodes have been in use since 1824 but what is the future for this form of Cathodic Protection? The paper reviews where the technology has come from and speculates on its future.
14.10 Presentation Two: The development and use of galvanic anodes for the protection of atmospherically exposed steel reinforced concrete
Dr George Sergei - The talk deals with the development of galvanic anodes over the last 15 years from the initial use for the enhancement of patch repairs to the more global protection of reinforced concrete suffering from steel corrosion and the future of this technology.
14.50 Interval
15.10 Presentation Three: Designing Retro-fit Anode Arrangements
Ross Fielding – The presentation will look at common mistakes made in the design of off-shore retro-fit anode arrangements and how to overcome them.
15.50 Presentation Four: Galvanic Anodes – The Way Forward
Winston Shepherd – With new and challenging environments and applications for galvanic anodes currently used alloy compositions, particularly Aluminium alloys as described in new international standards, are examined to determine whether further alloy development is possible or necessary. The impact of new standard specifications on anode and pipeline CP design is described and the impact that anode attachment and support methods may have on anode performance is examined. The lack of realistic performance test methods and the abuse of currently accepted QC testing methods is examined.
16.30 Panel Discussion
17.00 Refreshments
17.30 – 19:00 ICorr AGM

Please let Denise at ICorr (email: Denise@icorr.org) know if you will be attending

Institute of Corrosion

AGM
22nd November 2012
5.30pm start
Birmingham Council Chambers, Main Chamber, Birmingham B1 1BB

See enclosed leaflet for further information
TRIBUTE TO DR PAUL MCINTYRE (1945-2012)

The first part of this tribute is a somewhat edited version of the obituary that appeared in CEST 2012 Vol 47 No 6 and is reproduced here with permission of the author, Stuart Lyon and Maney, the publishers. The second part is some personal reminiscences from Douglas Mills.

Paul graduated from the University of Newcastle upon Tyne with a 1st class honours degree before undertaking postgraduate research also in Newcastle on the topic of “The hydrogen embrittlement of niobium and vanadium. This led to the award of a PhD degree in 1970. He spent his early career in the steel industry initially at BISRA and then moving to the British Steel Corporation in Rotherham as section leader researching environmental fracture and developing new steels with improved resistance to environmental cracking.

In 1978 he moved south and joined the Central Electricity Research Laboratories in Leatherhead as group leader of EAC studying stress corrosion, localised corrosion and corrosion fatigue in conventional and nuclear power plants. But after Privatisation of the electricity industry Paul remained with National Power as consultant in asset management and remaining life assessment of components including novel and early applications developing least cost remedial methodologies such as RAM (reliability, availability and maintainability) and RCM (reliability centred maintenance).

In 1996 Paul became an independent consultant with expertise in life assessment of materials and optimisation of maintenance methods while continuing his life long interests in environmentally assisted cracking phenomena.

For six years from about 2004 until 2010 he worked as a consultant in the electrochemistry and corrosion group at NPL responsible for running the Lifetime management of Materials i service. From 1996 until 2006 he was editor or the British Corrosion Journal steering it though challenging times and initiating a development strategy that included the change of name to CEST that has brought an almost doubling in the number of published issues annually.

His scientific insight and depth of engineering experience was critical to successful analysis of a wide range of failure investigations including fracture of wind turbine bolts, corrosion pitting in a desalination plant as well as providing informed corrosion control guidance to industry.

During his time in industry Paul wrote almost 60 published papers and over 20 internal reports, pioneering the application of fracture mechanics to hydrogen embrittlement and crack growth in steels.

In addition to his career in industry Paul had almost thirty years of participation in corrosion standardisation within BSI and ISO committees. These included being past chair of ISO/NFE B Corrosion of metals and alloys, and UK representative on the equivalent ISO committee TC 156 and within that being secretary of WG2 Stress Corrosion Cracking, and a member of WG 7 accelerated corrosion tests. He was chair of the Corrosion Coordination Group comprising The Institute of Corrosion (ICorr) and the Institute of Materials Minerals and Mining (IOM3). He made an immense contribution as Scientific Secretary of the EFC and during that period he was also secretary of the Federation of European Materials Societies. The success of many of these organisations owed much to Paul’s supreme dedication and commitment.

He was also on the council of the Institute of Corrosion from the early 2000s specialising in standards work and pan European activities. He was also committed to education and lectured on stress corrosion and corrosion fatigue on MSc courses at the Universities of Surrey, and Nottingham and at Imperial College.

Also he was on the steering committee for the MSc course at the University of Manchester (corrosion and protection centre).

In 2003 Paul was awarded the T B Marsden prize of IOM3 for his considerable achievements in promoting standards, education and publishing in corrosion and materials. The chair of ISO TC 156 stated at the award citation “Paul has provided more input into the development of ISO standards in the corrosion field than any other individual.”

In 2011 at the Eurocorr meeting in Stockholm, Paul received in person Honorary Life Membership of the EFC, a very rare honour as the EFC is a confederation of societies and does not normally offer membership to individuals and Paul was very proud to be recognised in this way.

Paul was invariably polite and accommodating to everybody. But he had core of steel and dry sense of humour. He will be sorely missed.

Paul McIntyre: a few personal memories

Although I had previously heard of Paul, I first met him to talk to when I joined the Board of BCJ some 22 years ago. I kept in touch with him in a minor way during my time in Fargo, USA and when I got back to UK in the mid 90s, and found myself without too much in the way of employment. Paul, knowing this, invited me to become involved in a successful standards meeting. This was in late 1995 and it led to the publication of a book on Corrosion Standards and International Developments with he and I as joint editors (this followed on from previous conference put together by Paul and Tony Mercer). This was a great honour for me as Paul’s reputation in the field was already very high and it boosted my confidence to the extent that not too long after that I was able to get back into proper work. We then got involved together in reporting in some detail the Eurocorr meetings with Paul helping me to get funding to attend these (typically 400 papers of which between us we might review about one hundred and fifty). For about eight or nine years we worked well as a team on these, as our corrosion interests complimented one another with Paul covering the sessions that he had particular expertise and knowledge of like SCC and high temperature and myself covering sessions like coatings and inhibitors.

Paul’s thorough approach was a good example continued
Continued from previous page

to me and I tried to emulate him (since Paul stepped down from doing this in about 2007 I have done it all on my own and I have to say it has never been quite the same). We also worked together on the EFC stand at various Eurocorr, I remember helping him in Trondheim to get unsold books back to the post office for return to UK. He also got me assisting with other European Federation of Corrosion duties eg on the financial side like sending out invoices and reminders to member organisations. This work was leavened with humour which we needed as the computer we used (Folly appropriately named) was primitive and had a tendency to "crash" such that we sometimes lost what we had been working on. We were fortified in these activities by visits to Mario’s (a small restaurant near IOM3’s base) for refreshment which Paul always insisted on paying for. I also had a brief spell as treasurer after Charles Booker’s retirement, a post that afforded me the chance to visit Paris and Frankfurt, together with Paul, for EFC meetings. These were generally enjoyable. But one day coming back from Paris our Eurostar train came to a halt just outside the channel tunnel. Paul rummaged in his briefcase and brought out a very large book. I asked him why he had got such a large book out. He said “when this train stops here it is always an hour and a half’s wait”. I was sceptical. But an hour and a half later almost to the minute the train started again! Since that initial standards meeting that later almost to the minute the train started I have come to know Paul and his wife Helen as a personal friend with a number of visits made to their beautifully situated home in the Surrey Hills. During these visits I met other members of the McIntyre Clan: his immediate family includes three children and four grandchildren and the importance of family to Paul (which I often met Paul usually in Europe working with CEN and ISO, notably the ISE/NFE/8 and ISO TC 156 corrosion committees.

Following a diagnosis of secondary cancer of the liver, Paul retired in 2010 just as he reached his 65th birthday. He had not planned to retire at 65, but sadly, he was left with little choice. Since then I have come to know Paul and his wife Helen as a personal friend with a number of visits made to their beautifully situated home in the Surrey Hills. During these visits I met other members of the McIntyre Clan: his immediate family includes three children and four grandchildren and the importance of family to Paul (which I had picked up from his frequent references to them while we had been working together at London ) was brought even more closely home to me. On a number of visits to see Paul he took me in his sports car for a pub lunch. Apparently Paul had always hankered after a sports car, and after the commencement of chemotherapy he was encouraged by his family to get the BMW Z3 that he had had his eye on. This timely diversion gave Paul a lot of pleasure over the following year or so. (See photo of Paul with Z3). On a more recent visit he wasn’t well enough to drive, but nonetheless he managed to enjoy a visit to the Watts Gallery near Guildford.

Earlier this year, on hearing that I had a student interested in solar energy, and having recently had solar panels installed on his own property, he was more than happy to provide some information and some data for her.

Paul was cared for at home throughout his illness and his son Henry took leave from work to support Helen and assist with caring for Paul during his final weeks. Paul was philosophical about his illness and remained stoical throughout his treatment. On that score, and on many others, he was a great example to the rest of us.

Finally I would say that I found Paul to be a man who was not only very clever and thorough but also was someone who very generous with his time both to me and to others. He made a really great contribution to the field of corrosion. Like me he did believe in family and the importance of family to Paul (which I had picked up from his frequent references to them while we had been working together at London ) was brought even more closely home to me.

Dear Sir,

It was with sadness that I read of the death of Paul McIntyre in June. During my time with Corus at Swinden Technology Centre in Rotherham, where Paul once worked in British Steel days, I became involved with several industry standards committees through which I often met Paul usually in Europe working with CEN and ISO, notably the ISE/NFE/8 and ISO TC 156 corrosion committees. Paul was always very helpful and could be relied upon for support and guiding information with the development of standards and was a great diplomat for the British delegations. Even through his busy workload as a technical editor, EFC Secretary and latterly consultant, Paul would find time to facilitate standards conferences, write papers and provide news for the Institute and its members in the pages of Corrosion Management.

I remember Paul as I knew him, a quietly spoken, kind and thoughtful gentleman who was a great credit to the corrosion world.

Roger Hudson, (retired Principal Corrosion Technologist, Corus Technology Centre)
PROFESSOR DAVID SCANTLEBURY (1943-2012)

David Scantlebury: teacher and researcher in corrosion science and engineering at UMIST then The University of Manchester; born 23rd October 1943, died 13th July 2012; survived by his wife Ilma and children, Michael, Liz and Andrew.

David was a larger-than-life character, who left an indelible mark on all those who met him. He was a raconteur, a bon-vivant, a sailor, a singer, a Cornishman, a scholar, a potter, a gentleman, a family man, but most of all he was a teacher. Born in Penzance in 1943 to an old Cornish family (the name Scantlebury is said to signify a craftsman), his father was headmaster of the local school that he attended. Some of that early environment must have rubbed off because education and teaching was in his bones while Cornwall was in his blood; his accent always returned either when he was reminiscing about his childhood or on the odd occasion when he was annoyed with you.

David attended Downing College, Cambridge and graduated in 1965 in Natural Sciences with his final year (Part II) in Metallurgy. His contemporaries in corrosion included: John Sykes, Chris Page, Douglas Mills, José Galvele, Eamonn Kinsella, Bob Cottis and Robin Procter while his undergraduate director of studies was T.P. “Sam” Hoar. He would have been taught by (or met) those that were then famous, or became famous, in the field: Cottrell, Hoar, Evans, Davies, Ralph, Kelly, Chilton, Mayne to name a few. He loved his time at Cambridge being a keen rower and singer, as well as meeting and marrying Ilma, and was encouraged to stay on to undertake his PhD by Jack Mayne studying “The Mechanism of Conduction in Pigmented Polymer Membranes”. Thus began his lifelong passion for paint.

After a short period as a post-doctoral researcher in Mayne’s group, David joined Portsmouth Polytechnic in 1970 as Lecturer and he helped establish the corrosion group there with Des Barker. However, the newly formed Corrosion and Protection Centre at UMIST proved a big attraction and he was appointed to a Lectureship by Graham Wood in 1974 and moved to Manchester with a remit to develop a research group in protective organic coatings. In recognition of the important work he did with industry, much in collaboration with Les Callow and Jane Lomas, he was appointed some ten years later to the International Paint plc Lectureship in 1984 with promotion through to Reader following several years later. After the merger between UMIST and The University of Manchester, he was promoted to a personal Chair in Corrosion Science and Engineering in 2006. After nominal retirement in 2009, rather than following the Emeritus Professor route, he continued to be actively involved in teaching and research.

Over the years David’s research interests expanded to include: paints and organic coatings for the protection of metals in a range of environments, cathodic protection, corrosion of reinforcing steel in concrete, marine corrosion and the development of calcareous films. During his long career, he pioneered novel tools for the measurement of interfacial properties between coatings and substrates including the accurate measurement of adhesion using the “blow-off” method. With colleagues at UMIST, he pioneered the application of electrochemical impedance spectroscopy to the measurement of organic coatings degradation. He made major steps in the elucidation of the mechanisms of underfilm corrosion and inhibition and developed detailed understanding of coating disbondment and filiform corrosion. He also undertook significant research on the cathodic protection of steel reinforcement in concrete particularly in the measurement of chloride ion migration using ion-selective electrodes. Latterly, after his retirement, he re-visited one of his first interests in the nucleation and growth of calcareous films on steel.

David liked to travel and greatly liked academic discourse and was never happier than when he managed to combine the two. He was particularly fond of the Far East and Australasia and at various times was a Visiting Professor in Xiamen University (China), Chulalonghorn University (Bangkok), Murdoch University (Western Australia) and the Science University of Tokyo as well as undertaking an extended period of sabbatical leave at Curtin University in Perth, Australia. He was a keynote speaker at many conferences, memorably twice for the Libyan Corrosion Society and three times at the Australasian Corrosion Association Congresses. Where he could not find an appropriate conference to attend, he organised one for himself as he put it: “to combine excellent discourse, good food and wine with Cambridge is the ideal package”.

Hence, in 1989, his quinquennial Christ’s College series on “Advances in Corrosion Protection by Organic Coatings” commenced, the most recent of which was held in 2009; the 2014 event, which he was planning before he died, will go ahead in his memory.

Overall, David successfully supervised 68 PhD students, published over 220 papers and was, in 2007, awarded the U.R. Evans award of the Institute of Corrosion for research excellence. However, notwithstanding these achievements it will probably be for his teaching that he will be most remembered. David never forgot that the primary aim of an academic at a University is to teach, and at that he excelled. David’s influence over 40 years of teaching corrosion science and engineering is unparalleled. At Manchester, he was MSc course leader and Chair of the Board of Examiners for over 20 years and admissions tutor for 8 years; he also organised the annual short course in Corrosion Control Technology for over 30 years. His annual teaching contact hours were commonly double those of his colleagues and he continued teaching almost at the same level right to the end. I remember visiting him in St. Ann’s Hospice in May this year where the first thing he did was to hand me his marked questions from the Spring semester examinations. Although by then no longer able to handle a pen, he had arranged for his family to read the scripts to him and to write in comments and the marks. He taught widely across the Faculty and was an exponent of traditional methods – death by Powerpoint was definitely not for David. One of his proudest moments came in 2001 when he was awarded the UMIST Millennium Prize for excellence in teaching with supporting comments such as:

Continued
Continued from previous page

“most enjoyable”, “refreshingly energetic”, “best lecturer we’ve ever had”, “inspiring and fun too”, “tremendous teaching skills”. It is not an exaggeration to say that David directly influenced an entire generation of corrosion engineers.

David’s passions were for education and for corrosion science, but he was also very much a renaissance man, excelling in many areas. He would have been at home in any century with his intelligent and inquisitive nature and outgoing personality and warmth. Beyond work, he loved that his family were of an artistic nature and he himself tried to match them by becoming a skilled potter, installing a kiln in the basement of his house. He also loved nature and owned an allotment on which he grew summer vegetables and fruit. As a Cornishman, the sea was particularly close to his heart. He became a Royal Yacht Association qualified sailboarding instructor and a PADI approved open water diver. Latterly, he bought a Cornish rigged gaff sloop, which he kept moored on a creek near Lytham St. Annes. He frequently asked me to crew for him and to my regret I was not always able to oblige. When I did the hospitality on his boat was exemplary – providing drink and snacks while the visit to the local fish and chip shop (“the best outside Cornwall”) on the way home was always memorable.

David had a remarkably open relationship with his illness, documenting his ups and downs in the “D6 News” blog (now sadly unavailable). First appearing as bowel cancer in the early 2000’s and requiring an operation to remove his large intestine, it re-occurred with increasing frequency over the years. Finally, a neck tumour was found to be causing increasing pain and immobility in his arms and left him fatally weakened. Although he was aware of his condition, he had the courage to not allow it to define him.

He leaves us all missing him terribly.

Stuart Lyon, Corrosion and Protection Centre, School of Materials, University of Manchester.

This obituary will be published in Corrosion Engineering Science & Technology 2012 Vol.47 No.7 and appears here with permission of Maney.

---

ABERDEEN BRANCH CORROSION AWARENESS DAY

On the 22nd of August, the ICorr Aberdeen branch hosted the 2012 Corrosion Awareness Day at the Palm Court Hotel. The event coordinator, Dr Abdulmotaleb Suleiman introduced the course stating that the objective was to provide a basic introduction to various aspects of corrosion and encouraged active participation from delegates.

Professor Paul Lambert started the day with an introduction to corrosion and corrosion mechanisms. He drew similarities of the corrosion process with the working process of a zinc carbon battery and identified the various components of a corrosion cell. He went on to give illustrative descriptions of anodic and cathodic reactions presenting the relevant electrochemical equations and explaining the thermodynamics of corrosion reactions. On either side of the first coffee break, Professor Lambert explained the various forms of corrosion and went into more details in explaining the underlying mechanism of each form of corrosion. He touched on the negative and positive effects of the marine environment on structural steel components explaining the relevance of steel in construction. Professor Lambert demonstrated with a video session the enormous cost of corrosion in terms of maintenance costs and loss of infrastructure. He followed this with an illustrative timeline reference description of history of corrosion and described the various techniques used in managing corrosion in practice.

Steve Tate of Stork followed with an overview of corrosion monitoring techniques and field applications. He explained areas of monitoring using various specialised techniques. He noted that the main reason for monitoring was to help identify corrosion and its underlying cause. Mr Tate focused on the working principles of intrusive monitoring techniques noting positioning, access and interpretation of data as common problems of using these devices. He distinguished between the mechanical and hydraulic fittings and emphasised the importance of safety. “The industry has moved away from single to double isolation valves to protect against pressure in the line” he observed. Steve finished his talk with an explanation of transmission, trending and usage of data from monitoring devices noting the benefits of these devices techniques as providing useful information on corrosion control.

After lunch, Simon Hurst of CAN Offshore covered the principles and main stages of integrity management. He started by presenting the various definitions of integrity management explaining the major role corrosion management played in the overall integrity management process. He pointed the audience in the direction of the Energy Institute Guidance Document on Corrosion Management [1], which he identified as a good reference document to corrosion management. He went on to explain the benefits of good integrity management describing the various stages with a series of illustrative flow charts. “Everyone involved in the integrity management process is important and it is essential for the team to maintain a good culture of effective two-way communication”, Simon Hurst noted as he explained the importance of having smart roles and responsibilities defined. Clear policies & objectives, risk assessment, implementation & analysis, complex interfaces, system performance review and importance of documentation at all stages were some of the other areas he covered.

Just after the coffee break, Paul Lambert presented some innovative developments in
the use of vapour phase corrosion inhibitors explaining different types of corrosion inhibitors used in corrosion control. He discussed the results from some laboratory and field tests. He also described the passive (sometimes beneficial) effects of these inhibitors on stress and friction on bridge cables. He mentioned that corrosion monitoring had also been used to confirm the effectiveness of these vapour phase corrosion inhibitors.

Alistair Seton of Subsea 7 covered various aspects of material selection for subsea pipelines and other assets. He started by identifying and explaining typical subsea facilities with a sample field layout. He presented the definition of material selection, explained the process and the considerations made during the process. He identified mechanical and corrosion resistance properties as important considerations outlining predictable and unpredictable failure mechanisms. He outlined various important design and operation parameters used in predicting material degradation, which he noted were essential to help the engineer select the right material for its intended service conditions and design life. Questions and discussions on various aspects of corrosion were held throughout the day.

The Aberdeen branch committee would like to thank all the institute sponsors for their continued support and encourage new sponsors. More information about the Aberdeen branch activities can be obtained from the ICorr Aberdeen branch committee secretary Muhammad Ejaz via ICorrABZ@gmail.com. Alternatively, 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.

Alan Foxton is self-employed, and currently providing welding and materials support to the SURF scope of the BP Quad 204 project. Alan has a unique extensive experience in the application of carbon steels, corrosion resistant alloys and welding techniques that stretches over four decades. ICorr Aberdeen branch committee members, Frances Blackburn and Eugene Ogosi met with Alan to unravel the secrets of metals, welding and corrosion control by material selection.

Q. Could you please tell us about your professional background?

A. I would describe myself as a jobbing metallurgist. Jack of all trades, but master of none. I’d like to think I can talk knowledgeably about most subjects, but I don’t think I’m a true expert in any area. That’s not to say I don’t have opinions though. I started in the steel industry in the early 1970’s, and learnt my trade in amongst the turmoil of strikes and redundancies. My time in the steel industry period culminated with several years in welding research, working as a practical metallurgist, trained in testing, reporting and many long hours of microscopy. Weld Heat Affected Zone (HAZ) microstructures were my specialist subject, and study of the weldability of new steels made by the Basic Oxygen process stood me in good stead for my future career. I knew none of this at the time though.

I managed a materials testing laboratory on Teesside, during the boom years of the oil and gas industry on Teesside, getting exposure to the commercial world, and making some great contacts. From here I joined Foster Wheeler, working in their power generation manufacturing plant, working on boilers for the electricity industry, and latterly managing a weld development laboratory for the nuclear industry. This experience was priceless, with nickel alloys and stainless steels becoming a routine part of my life. Development of Internal Bore Welding processes for the nuclear industry led to my award of a Fellowship of the Welding Institute, and I was also a chairman of the Teesside branch committee members.

I joined the offshore industry in the late 1980’s but I had a break from Oil and Gas to work in the rail industry, as welding engineer on the UK’s first Aluminium trains (closely associated with Friction Stir welding process development), but the endless approaches from agencies led me back to Aberdeen, and a career, which can be best, summarised as “things to do with pipes”.

Q. Was there any specific attraction to Materials and Corrosion as a discipline? Why did you choose it as your core discipline?

A. It sort of chose me. I left school disillusioned, with no career path and no great ambition or useful qualifications, and got a job in what was then British Steel as a Technical apprentice. That involved working in laboratories, and I always enjoyed my time in the metallurgy labs, eventually joining their metallurgy labs at Lackenby on Teesside assisting with failure investigations. British Steel later sponsored my degree in Metallurgy, and I joined their Welding Research laboratories working, as part of a team looking at the weldability of new pipeline steels amongst other things. I cannot imagine a better education in practical metallurgy was available, and coupled with my degree, set me up for my future career.

Q. What would a typical day at work be like?

A. I’m sure everyone says it, but there is no typical day. It is sometimes document production; sometime document review, and the inevitable meetings, with a sprinkling of travel. What is important though are the other people who are around me and form part of the team. As long as I have a decent project team around me (and coffee), the rest of the day is easy.

Q. How would you explain Material Selection as a technique for corrosion control to a non-specialist?

A. Understanding all the risks a particular component can encounter in its operating life, documenting this, and showing how these factors can be mitigated by a particular material. The job of the materials engineer in this context is to evaluate the costs and risks and offer the best compromise, always aware that there are other selections which offer different compromises.

Q. What are the main problems of getting Material Selection wrong during design and how can this be managed during operation?

A. Dead easy! Someone or something gets killed or injured. I’ve been involved in many failure investigations, and most had the potential to kill someone. Managing this is simply a matter of imagining family or favourite pet being in the vicinity of your material selection and all its inevitable compromises.

Q. What are the most important considerations when selecting a material for construction of any asset?

A. This varies for every application. It is essentially a consideration of various compromises such as cost and material properties. The factors, which can lead to failure, should be documented, and their consequences ranked specifically for that application.

Q. Your presentation during the joint ICorr/NACE Aberdeen branch meeting in May 2011 was well received by delegates and the title “Good Material Selection-Is this the death of the solid CRA?” was certainly thought provoking. Why do you think Cladding and Lined systems should receive more consideration by professionals during design?

A. Let’s start with a bit controversy. Corrosion engineers only have a job because the metallurgists are forced to consider the most cost effective solution to a materials selection. The metallurgist’s mistakes therefore become the corrosion engineer’s overtime. It would be easy to design facilities, which didn’t corrode, but unfortunately project managers have budgets. It’s separating the CAPEX (Capital Expenditure) budget from the OPEX (Operating Expenditure) budget and more importantly keeping them running that creates the compromises. Once we get to the point where total life cost gets its rightful acceptance, and then material selection will have less compromise.

So what we need in the pipeline world is a pipe, which is as cheap as possible, but offers resistance to the internal and external environments. That is the lined pipes, and the clad pipes. By putting a stainless steel or nickel alloy liner on a carbon steel pipe, we can get a product, which is far superior to
the sum of its parts. There are many stainless steel pipelines in service, in duplex steels and 13%Cr steels and yet why would anyone choose to put an alloy that is susceptible to chloride pitting into warm, oxygenated seawater? So we have to compromise on the external environment (pitting/embrittlement) to get a material suitable for the internal environment. Lined and clad pipes remove this compromise. Again to continue the controversy, lined and clad pipes should be the base case for transport of a corrosive fluid subsea, and only with a good reason should the solid alloys be considered.

Q. There are numerous nomenclatures used for specifying metals especially steel for construction? Is there any way to elucidate what is meant be all these number and alphabet combinations?

A. I guess this comes with experience. I know most of the national codes and standards applicable to my day-to-day work. If I changed to another industry (as I have several times) there is a shock factor that the pipes look identical, and come from the same place, but are manufactured to different codes and standards. This is compounded by the fact that there is a universal mis-trust of national standards, so most organisations have their own variant on any given national standard. I wouldn’t like to guess how many different grades of steel there are, but it’s in the tens of thousands, and there are hundreds of pipe specifications, all multiplied by end-user standards. That’s approaching one for every star in the galaxy. So you cannot expect any individual to know it all, and the only way to understand is to look at where you work, and what you do, and as a starting point understand this smaller pool of information. Then once you understand the “what” and “why” of your industry, you can talk with suppliers, and look for alternatives.

Q. With recent discoveries in oil and gas, there is an increasing requirement for materials that can survive even more demanding conditions? What do you think are the main challenges facing the material and corrosion engineer in the future?

A. Demonstration of the reliability of facilities. The challenges are pretty well understood, but the impact of any damage to the environment is assuming a greater importance on the materials that will be used. It is becoming more difficult to rely on a solution that requires intervention to control corrosion, e.g. a continuously pumped inhibitor, or regular operational pigging.

My view is that the calculations we use make too many assumptions, and if pushed to justify the assumptions, we would struggle. Any calculation which produces an answer to corrosion rates to 2 decimal places is wrong, and anyone who believes that Excel or Mathcad gives anything more than rough guidance to prediction of corrosion should question their confidence in the calculation before moving to the next step. That takes us to offering a material selection which is inherently corrosion resistant, supported by a testing regime.

Taking this step further, if we evaluate the cost of continuous inhibition and operational pigging, the cost differential between an actively controlled system over its design life, and a passively controlled, inherently corrosion resistant, system is significantly decreased. Add “cost of failure” into the equation, and carbon steel is not a viable solution to most subsea in-field hydrocarbon transport pipelines.

Q. Do you have any pet hates?

A. The words “Stainless Steel”. Okay, its pretty good at keeping its shine in the air, but it’s a long way from actually being stainless. In my early days as a test house manager I had an irate father as a client. He had bought his daughter some “Aircraft grade 304 Stainless Steel” stirrups for her show pony. She had sat up all night polishing them - and on the day, they went “rusty”. In my language, the young lady had spent the evening thinning the protective oxide coating that makes the steel “Stainless”, and then operated it in a hot chloride containing environment (a sweaty Pony). It was no use explaining to the man that it was his lack of a decent metallurgical education which had cost his daughter her Rosette. He just wanted his money back. So I would outlaw the use of the term “stainless steel”, unless the environment is defined fully!!

Q. Do you have any general advice for a professional starting out in material selection?

A. There is no right answer to any material selection. Whatever you recommend, someone else will have a different solution. Look at their solution. Think about it, understand it, else will have a different solution. Look at their solution. Think about it, understand it, but don’t assume they are right.

The members of the Aberdeen branch committee would like to thank Alan Foxton for his contribution to our interview series. We will also like to commend him for his commitment to development of materials & corrosion and his support for our branch activities. This interview has been conducted by the Institute of Corrosion (ICorr) Aberdeen branch committee. More information about the branch activities can be obtained from the ICorr Aberdeen branch committee ICorrABZ@gmail.com. Alternatively, 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

NEW SUSTAINING MEMBERS PROFILE:

**BEN FALLOWS PAINTING AND DECORATING LTD**

Ben Fallows Painting and Decorating Ltd are an expansive and forward thinking Industrial Protective Coatings Contractor based in East Anglia. Established in 1997 and operating throughout the UK we specialise in Abrasive Blast Cleaning, Steel Work Corrosion Control, Application of Protective Coatings, Intumescent coatings, Commercial and Industrial Painting and Decorating, UHP Water Jetting, Graffiti Removal and Graffiti Prevention Coatings.

Ben Fallows is a company member of the Industrial Coatings Applicator Scheme and has a staff of qualified ICATS applicators. As a company we are constantly looking to stay ahead of the competition resulting in the relevant members of our organisation working towards their ICORR level 3 Paint Inspectors qualification.

We are pleased to now be considered a sustaining member of the institute of Corrosion and have no doubt that this membership will aid the continuing growth of our company.

Please visit our website info@benfallowspaintingdecorating.co.uk for more information.
Introduction

The Forth Road Bridge (FRB) is a long span suspension bridge and was opened in September 1964. The Forth Estuary Transport Authority (FETA) is the body responsible for the management, maintenance and operation of the bridge. The bridge crosses the Firth of Forth some 15km west of Edinburgh and is a vital link in Scotland’s strategic road network.

The main towers of the bridge are of steel box construction rising some 156 metres above river level and are formed from three fabricated steel boxes that are joined by cover plates to provide a five cell structure in plan. The legs of each tower are connected by cross members at the top, and just below deck level, and by diagonal stiffened box bracing above and below the deck.

Survey

In 2001, FETA engaged the services of The Steel Protection Consultancy (SPC) to carry out a coating condition survey of the main towers, make recommendations, and provide a fit for purpose specification for a remedial coating system.

SPC concluded that overcoating of the existing paint on sound areas, which were in excess of 95% of the total, would maintain the integrity of the present coating system and prolong the paint life for a further 20 – 25 years, without removal of the existing paint and/or metal coating back to steel.

The towers had been completely repainted between 1991 and 1993 with a five coat MIO/oleo-resinous system. Tension splices, which were been added as part of the tower strengthening works in 1997, had been given a two-part epoxy aluminium and MIO Phenolic finish coat.

FETA had earlier carried out paint trials on the under deck stiffening truss steelwork and SPC had recommended that paints for the towers should be selected from those used in these feasibility trials. Further compatibility trials were carried out at the pier head level of the south tower to ensure that the selected system would not have any detrimental effect on the areas where the existing system was being overcoated.

Painting

Painting commenced below the deck in July 2003. Areas of localised corrosion and paint breakdown were prepared by abrading back to sound paint, sound metal coating or bright steel using hand and power-tool cleaning methods.

These areas were then feathered back to sound metal coating before wet cleaning down. Finally, prepared areas of exposed steel were overcoated with a single coat of HA 115 Aluminium epoxy primer, two coats of HA 116 two pack epoxy (one stripe coat) with one coat on the sound paint, followed by a modified (No...
provide a dropped object canopy (DOC) above the level of the carriageway. The design of this unique structure was carried out by WA Fairhurst & Partners. Additionally steel beams were designed by C Scott and partners to support the tower access platform. These were fabricated and installed by FRB staff in 2005.

The DOC was installed above the road deck at the south tower in early summer 2006. This allowed the tower access platform to be assembled on the canopy and then hoisted to the tower top and secured to the cross girder in October 2006.

Painting then commenced at the tower top and due to the amount of minor steel refurbishment work required at the cross girder and around the saddle area the platform was secured at the top during the winter of 2006/2007. In April 2007, the lowering of the platform in two metre increments commenced and continued until December of the same year by which time over 65% of the painting was complete. However following the Christmas break the bridge was hit by severe storms on 8th/9th of January 2008, with gusts reaching between 80 and 90mph. This caused severe damage to the platform which had to be lowered to the dropped object canopy once the winds subsided. It should be noted that the dropped object canopy successfully prevented any items from landing on the carriageway.

This incident severely affected progress and work did not recommence on the tower until August 2008. Coating application at the tower south was successfully completed in September of the same year.

In October of 2008, FETA asked SPC to carry out a survey of recoating carried out on the north and south towers. It was encouraging that the SPC report found the cohesion and inter-coat adhesion of the new and existing system to be very good. In addition, the report found that the workmanship in the areas examined was also very good as was the resultant properties of the freshly applied coatings and this replicated the findings of the trial areas in 2002.

Following completion of a contract to dismantle and re-erect the DOC at the north tower, the tower access platform, which had some significant design improvements to mitigate any potential problems with high winds, was assembled and lifted to the tower top in late summer of 2011. Work commenced and was completed at the cross girder and saddle areas prior to the platform being secured to the cross girder for the winter months.

The lowering of the platform and coating application commenced in April 2012 and is currently on programme to be complete by the end of October 2012.

Once all painting is completed, the painting platform can be removed and the DOC dismantled. The latter operation involves overnight carriageway and limited full bridge closures. All of the painting work and modifications to the platform and cross girder have been carried out by FETA staff. However, erection and dismantling of the DOC has been carried out by an external contractor.

The total project cost of painting the towers likely to be £ 4.1 million giving a high unit rate of £ 241 per square metre. Most of that cost is access and containment.

Acknowledgement

All permanent painters employed by FETA are registered industrial coating applicators under the ICATS scheme. FETA’s painting inspector is ICORR certified to Level 2. It is testament to their skill that this project has reached a successful conclusion.

Additionally, the installation and operation of the tower access cradle requires a large number of skilled people to work together effectively. This paper is dedicated to all those past and present who have been involved in this challenging project.
MICELLE DETECTION FOR OPTIMISING CORROSION INHIBITOR DOSE ON AN OFFSHORE PLATFORM

Cameron Mackenzie and Emma Perfect, LUX Assure, Edinburgh UK

ABSTRACT

This paper builds on the evidence for the optimum dose of organic film-forming corrosion inhibitor (FCCI) being at the critical micelle concentration (CMC) of the surfactant components, and the concept of micelle detection as a tool for understanding the effectiveness of the inhibitor dose in the field. It extends the underlying principles from laboratory testing, to the rapid analysis of field fluids and explores the different results available from alternative instrumentation.

An inhibitor optimisation trial was undertaken on an offshore oil production platform for protection of a subsea pipeline used to tie back wells 10 miles from the platform. Two micelle detection devices were used, both primarily using fluorescence detection—a simple handheld device for offshore testing and a more complex device used for testing shipped samples in an onshore lab (CoMic™). Electrochemical corrosion monitoring was also used to analyse the produced fluids as the inhibitor dose was varied from zero to 200% of the estimated optimum dose. Results were clouded by operational issues outside the control of the experiment but interpretation of the whole suggested that the offshore portable micelle analysis was overcome by large quantities of dispersed oil, which masked the optical process. However, the lab CoMic™ testing gave some promising results, demonstrating a correlation between increased micelle levels and high inhibitor dose and suggesting that the original dose was sub-optimal.

A further experiment was conducted on samples arriving at a receiving terminal via an offshore transportation pipeline. Water samples were analysed as they arrived at the facility and CoMic™ analysis confirmed optimum inhibition with only slight variability observed over the duration of the trial. Analysis of water associated with pigging revealed a high micelle population, suggesting that the action of the pigs strips the corrosion inhibitor film from the pipeline walls.

These experiments supported the need to use the more complex instrument to be able to detect micelles in very impure systems. Field deployment of the CoMic™ technology is now underway.

BACKGROUND

The large network of metallic infrastructure, often in extreme environments, creates a significant challenge in maintaining asset integrity in oilfield production systems. Internal corrosion in pipelines and vessels can often be controlled by the use of chemical inhibitor additives which must be replenished regularly during continual flow (Energy Institute, 2008). In general terms there must be a certain concentration of inhibitor in the bulk fluid in order to maintain a fully protective film on the target surface. It is therefore important to ensure that an adequate bulk inhibitor concentration exists, but it should also be ensured that the concentration is not higher than required as the chemicals are often toxic and have unwanted side-effects. Ideally the inhibitor dose is kept within a narrow concentration range where it will offer adequate corrosion inhibition without being significantly overdosed.

Accurate measurement and control of inhibitor dose is challenging (Son, 2007). Production systems are fundamentally dynamic in nature with too many variables to reliably predict, therefore regular measurements are required. Inhibitors are a complex blend of multiple components, each reacting differently to the changing conditions, so traditional analytical chemistry techniques which target a single chemical component are deficient when considering the whole (Achour et al., 2008). The concentration at which the inhibitor forms a fully saturated film is also dependant on several external factors such as metallurgy, fluid chemistry, flow rates, PVT, etc.

CoMic™

We have previously introduced (Mackenzie et al., 2008) a novel concept for corrosion inhibitor monitoring which builds upon historic literature reports (Dupin et al., 1981) that the film-forming components are at their optimum protective strength at a specific concentration termed the Critical Micelle Concentration (CMC). As the name suggests this is the concentration at which discrete inhibitor molecules tend to spontaneously aggregate into ordered structure called micelles. The concept described here uses micelle detection as a basis for interrogating a test solution for presence of an optimal concentration of inhibitor.

Corrosion inhibitors applied in oilfield production systems function by coating the fixed internal surfaces with a barrier layer of film. This is achieved by formulating active ingredients which are attracted to the surfaces (surfactants) with solubilising agents, synergists, diluents and other production chemicals in to an inhibitor package. The basis for these inhibitors is the surfactant which is typically a familial mix of batch reaction products with hydrocarbon “tails” in the C10-C16 range. Usually the “head” group has cationic character with quaternary nitrogen often being present. This structure provides the molecule with an amphipathic character which drives function whereby the ionic structure adsors to the surfaces in need of protection and form a uniform new surface, usually with oil-wetting nature (Kellend, 2009).

Due to the unusual distribution of charge density across surfactant molecules, they have highly unusual properties both at interfaces (where they are typically functional) and in the bulk phase (Myers, 2005). In many fluid environments the surfactant molecules are in equilibrium between the interface and the bulk phases, governed by kinetics of adsorption and desorption and so there is a fundamental relationship between the two. In the bulk solvents at least part of the molecule suffers energetic repulsions; whether it’s the polar “head” or the apolar “tail” depends on the relative polarity of the solvent. This is part of the reason why surfactants are driven to...
interfaces where repulsions are minimised, but such interfaces are not always available and molecules exist in the bulk. When these molecules exist above a certain concentration and their local number and proximity is enough, they spontaneously form aggregated structures to avoid the repulsive forces experienced in the bulk. In polar solvents such as water or brine, the structure is called a micelle and the concentration is the CMC.

The CMC is dependent on the chemical in question and also the environment in which it is located, and is an important consideration in the measurable effect of the surfactant on a system. For example, when measuring interfacial tension or conductivity it is typically observed that these variables show a proportional relationship with surfactant concentration below the CMC and a different relationship above it, where there is very often no change at all. In the case of corrosion inhibitors, this can be considered in terms of adding surfactant-based CI to a pipeline fluid where it migrates to a pipe wall and has the measurable effect of reducing corrosion rate due to the presence of the protective barrier. The film saturation and therefore the corrosion protection is proportional to inhibitor concentration at low concentrations but at the CMC, the film is saturated and the bulk concentration is such that molecular density allows micelles to form in solution (Malik et al., 2011). In a static system, further addition of inhibitor only creates further micelles rather than having any effect of the surface film and corrosion protection. Whilst it has been shown that concentration at the CMC provide the optimal corrosion protection in laboratory tests (John et al., 2006), it is hypothesised that in the dynamic environment found in the oilfield, the flow rates, flow properties, fluid properties and persistency of the inhibitor (rate of desorption) will complicate this theory. In very mild corrosive conditions a dose below the CMC of a high-performance inhibitor might be sub-optimal but might be acceptable as an unsaturated film might be sufficient to confer adequate protection, and in harsh conditions concentrations significantly above the CMC might be required to increase the effective replacement rate of film as it is stripped from the pipe wall. In either case, rapid measurement of the micellar properties of the fluids, along with operator knowledge of the pipeline conditions, has the potential to provide a powerful additional tool to a corrosion management programme, spanning the gap between inhibitor dosage predictions and corrosion rate measurements, and providing functional concentrations relating to the combination of active surfactants rather than chemical concentrations of a particular component.

Micelles are neutral buoyancy droplets with dimensions typically ranging from 10 to 300 nm and so they are very difficult to detect using conventional direct methods. Our previous publications have reported progress made in micelle detection using instrumentation which might be used in the field (Mackenzie et al., 2011). The most promising techniques use indirect micelle detection from fluorescent reporter additives which can be added to test solutions in low concentrations to locate within micelles and produce a measurable and proportional fluorescent response. Such techniques are used widely in research and diagnostic testing in the life sciences. It has been shown that many oilfield corrosion inhibitors behave as typical surfactants, with defined CMC’s and a proportional relationship between numbers of micelles and fluorescence intensity and peak emission wavelength. This has previously been shown to allow the use of a portable handheld fluorescence reader to allow for simple measurements in the field (Mackenzie et al., 2011). For such a device to function, visible light must be able to pass in and out of the analyte solution without being impeded and, knowing the turbid nature of many oilfield samples, alternatives instruments have been investigated. Of the two devices described in this paper, one is a simple handheld fluorometer which was used on the offshore platform and one was a laboratory-based instrument which used hydrodynamic focusing to analyse a very fine stream of particles and therefore negates the need for a transparent solution.

In this paper we report an expansion of the promising laboratory data to field testing:

1. At an offshore production installation. Two different analytical techniques were used independently to monitor the effect of changeable inhibitor input dose on the micellar properties of the fluids and online electrochemical corrosion rate monitoring was used to investigate the link between micelles and corrosion rates.

2. On an onshore oil receiving terminal where the more comprehensive analytical system (CoMic™) was used to analyse produced water over a number of days, to determine the presence and variability of an effective inhibitor dose.

EQUIPMENT AND PROCESSES

Field 1:

The corrosion inhibitor was continuously injected via umbilical at the well approximately 10 miles away from the platform which it was tied back to. Estimated fluid transit time from well to platform was approximately 12 hours. The produced fluids had a water cut of approximately 20% and were processed independently of other production wells using a test separator which was brought online for the duration of the trial. The purpose of the trial was to optimise the corrosion inhibitor dose rate as subsea corrosion monitoring data suggested a recent increase in corrosion rate. The corrosion inhibitor application rate was altered during the study using the volumetric calibration cylinder on the injection pump. A highly sensitive electrical resistance corrosion probe based on a ratiometric principle was installed on the water-leg of the test separator by a third party service company for continual monitoring, and spot-samples were regularly taken from a similar location for the micelle detection experiments.

The intended schedule for the trial was as follows:

- Day 0 – equilibrate systems at existing dose rate (100%), then switch pump off (0%)
- Day 1 – increase pump dose rate (190%)
- Day 2 – return pump dose rate to initial setting (100%)

However, an unrelated production issue resulted in an unexpected shut-in after day 1 of the trial. Instead, the schedule was as follows:

- Day 0 – system equilibrated at 100%
- Day 1 – pump switched off (0%)
- Day 2 – pump restarted at 140% of original dose
- Day 3 – production halted
- Day 4 – production restarted, test separator taken back online with chemical injection at 100% of original dose, increased to 190% after eight hours
- Day 5 – pump dose rate decreased to initial 100% level

Samples were analysed in triplicate offshore for micelle presence by adding 1% (by volume) of LUX Marker™ fluorescent solution to 3 mL of test samples shortly after the source 250 ml samples were taken. The subsamples were taken from the predominantly aqueous phase where possible. They were then probed for fluorescence intensity using an optical filter-based fluorometer (Turner Designs, Sunnyvale, CA) and the intensity was recorded. Many of the samples were extremely turbid with oil content over 90% observed in some cases, so the remainder of the samples were left on the laboratory bench to separate further before being tested the
next day. At the end of the trial, sub-samples were taken from each sample and shipped to the onshore laboratory for micelle testing with the CoMic™ instrumentation.

Onshore laboratory testing took place approximately ten days after the trial commenced. After being static for this period, samples were noticeably more separated and the aqueous samples were much clearer than when they were initially tested. Samples were prepared for analysis in the same way as the offshore testing using 1% LUX Marker™ to reveal micelles. It was then sampled and analysed automatically by the CoMic™ instrument. Each sample was analysed in triplicate at a flow rate of 500 mL/s, and a 60 s experiment time. The system was set up to trigger a particle being detected by applying a pre-determined threshold fluorescence value and for each particle detected, three fluorescence intensities (at differing wavelengths determined by bandpass filters) and two light scattering intensities (at differing geometry to the flow cell) were recorded. The data was then analysed using a proprietary clustering algorithm designed to ensure that all five data parameters met the expected criteria of a micelle (from previous experiments) and that all data was available for analysis. The data was then filtered to remove background noise and then re-started at an elevated level. The exact transit fluids time and inhibitor persistency was known so the results were made much more difficult to interpret with confidence. The real-time corrosion rate data was made available to the authors as part of the trial, although it was carried out and interpreted entirely by the third party service company. It is understood that some localised issues with gas alarms further impacted the system was being under-dosed, which was the hypothesis of the operator. Towards the end of the trial, and is shown in figure 2, expressed as an average rate during periods where the rate was observed to remain approximately constant.

There is no clear increase in corrosion rate which might be attributed to the halting of inhibitor injection although there was a period of severe corrosion observed near the end of the trial which occurred for a very short period. The lack of a longer period of high corrosion is most likely due to the persistency of the inhibitor ensuring that the system remained protected throughout the approximately 30 hour period of production without inhibitor. Alternatively, it may be that there was an increased corrosion rate during the static period where production was halted and no measurements were taken. There were some periods during which inhibition appeared to be more effective, specifically at the start of days 2, 4 and 5 when almost complete inhibition was observed. The periods on days 2, 4 and 5 correlates well with the increased inhibitor doses of 140 and 190% feeding through to the detection site but there is no clear reason for the reduction observed on day 2 following a period of uninhibited production.

The results from the fluorescence testing using the handheld device were equally variable (figure 3), thought to be due to the high background oil content. Further experiments after completion of the trial have suggested that passing the samples through a wide mesh filter is a convenient and effective means of reducing this, but such filters were not available during the trial. One sample tested was found to produce significantly more intense fluorescence than the others (start of day 2) and this was re-analysed to ensure that it was not an anomaly due to background contamination but the signal was consistently higher than the others. This elevated result does correspond to a period of very low corrosion rate being measured by the metal-loss probe and so it is possible that there was an increased corrosion inhibitor micelle population at the time, although this does not correspond to any increased dose in inhibitor pump rate.

Figure 4 shows the results from sample analysis using the optical flow analyser for measuring micelle-like particles, and they are much more promising than the initial fluorescence results. Baseline 100% dose rate showed very few micelles in solution, indicating that the system was being under-dosed, which was the hypothesis of the operator. Towards the end of day 1 and the start of day 2, the samples appeared to have a slightly elevated micelle level. This correlates with the increased fluorescence and a decreased corrosion rate observed using the other techniques and supports the theory of an increased level of active inhibitor species in the fluid at this time. The reason for this remains unclear, especially given that the inhibitor pump had been switched off for a full day when this was
observed. One possible explanation might be the concerted desorption of inhibitor from the interfaces triggered by a sudden reduction in the bulk concentration and restoration of the bulk-surface equilibrium. There is not enough other evidence to support this theory and other more simple explanations relating to flow regimes may be more plausible but it is an interesting phenomenon in any case.

Towards the end of day 4 and start of day 5, during which time the increased inhibitor dose would be expected to have emerged at the receiving platform, the measured micelle levels were much higher than the baseline measurements. This corresponds with a surplus of active inhibitor in the bulk fluid and therefore the optimum dose being exceeded. It is understood that these findings are in agreement with predictions by the operator, that the established dose was too low and that the increase of 190% would produce a surplus of inhibitor in solution. It was also found that oil and water separation efficiency decreased during this period with the appearance of an apparent oil-in-water emulsion in the water leg of the test separator.

The operator assumed a twelve hour transit time for the pipeline, so this information could be used to predict a transit-time adjusted dosage of inhibitor to compare with the analytical results (figure 5). The results confirm the presence of elevated micelles when the dosage rate was predicted to be high.

Field 2:

As a comparison to field results, figure 6 demonstrates the results of micelle detection as a function of inhibitor concentration in a laboratory simulation carried out prior to field analysis. Such tests are useful to confirm the expected behaviour of the chemical, but they do not provide a quantitative calibration curve because the conditions experienced by the chemical are critical in how it behaves. The behaviour of this chemical was typical, showing very few micelles until the CMC was reached and then a roughly linear increase.

Field samples showed results above baseline, suggesting that the active inhibitor was present above the CMC in all cases, and the inhibitor was therefore adequately dosed. Figure 7 shows the initial samples analysed, and demonstrates that the pig water samples contained very much higher numbers of micelles than the general pipeline water. The scraper pig had a significantly higher micelle content than the intelligent pig water suggesting that the micelle content was increased due to the scraping of the
inhibitor film from the pipe surface. Although the pipeline water in the sphere sample appears to be virtually zero, this is due to the scale of the chart and in figure 8 it can be seen that the pipeline water samples had a micelle content above baseline. This figure also demonstrates that the micelle level is not constant in the pipeline and does fluctuate slightly. This would be expected as the various production facilities fluctuate in their production and contribution to the pipeline product.

CONCLUSIONS

Despite the field 1 study being hampered by a number of operational difficulties the results were both interesting and promising. The halt in production during the analysis, particularly during a period of changing inhibitor dose, introduced a number of unknown effects in to the system including prolonged residency in the pipeline and local flushing procedures upon restart. Together with the variable and unreliable results from the corrosion monitoring probe due to compatibility problems and separation issues on the test separator, overall results were clouded, reducing confidence in some of the conclusions. However these two broad conclusions could be drawn:

• The handheld fluorescence technique was overwhelmed by high levels of background oil. This is to be expected when using simple optical analysis on turbid solutions. Testing suggested that wide mesh filters performed well and will be used for future experiments.

• The CoMic™ instrument produced much more promising results in the laboratory testing, correlating reasonably well with inhibitor dose, predicted optimum levels and field observations.

This was reinforced by the testing at field 2, where the CoMic™ instrument was taken to the site for rapid diagnosis of the inhibitor dosage. The pipeline was found to be dosed appropriately with a small but significant presence of corrosion inhibitor micelles in the pipeline water. Further, the detrimental effect of pipeline pigging on the inhibitor film could be inferred by observing high content of active inhibitor in the pig waters, and the relative fluctuations of micelle content in the pipeline water over the duration of the trial emphasised the dynamic nature of the system and the usefulness of regular testing.

The CoMic™ technique offered a rapid analysis of impure solutions and provided data
which could easily be converted to relevant information about the protection of the system. As well as showing overall trends in available inhibitor, the information might also be used to infer knowledge of other events in the system which are less clearly related. For example, in field 1 tested here the established dose appears to have been sufficient until the water production recently increased and the data reported here appears to confirm that it is no longer sufficient. These measurements might provide a less expensive way of establishing this than direct measurements such as subsea corrosion probes and a more timely measurement than metal coupons, but are likely to be most effective when used in combination with these other technologies as a useful new tool in a corrosion management programme.

ACKNOWLEDGMENTS

The authors wish to thank the U.K. Technology Strategy Board for financial support of this project.

REFERENCES


NEW FILM ON WINN & COALES’ PRODUCTS APPLICATIONS

A new film featuring the wide range of applications of their Denso, Archco-Rigidon, Densostrip, SeaShield and Syylglas products has just been released by specialist anti-corrosion and sealing products manufacturer Winn & Coales (Denso) Ltd.

A free DVD of the film is available upon request but the film can also be seen on the company website, www.denso.net. The full version of the film is approximately 15 minutes long but for those in a hurry or with a specific problem area to deal with, it is also available online in segments, each one lasting just a couple of minutes.

The film covers most aspects of the company’s product range and being easily accessible on their website, illustrates perfectly the diversity of their products and the simplicity of the relevant applications to a much wider audience and ever growing customer base.

For more information contact Winn & Coales (Denso) Ltd or view the film at www.denso.net

For further information contact: Winn & Coales (Denso) Ltd., Chapel Road, London SE27 OTETel: 0208 6707511. Fax: 0208 7612456

e-mail: mail@denso.net. Web: www.denso.net
DENSO SUPPORTS THE PROSTATE CANCER CHARITY

Winn & Coales (Denso) Ltd, who specialise in the manufacture of Denso anti-corrosion and sealing products, joined several other companies in sponsoring Keyline’s Charity event in aid of Prostate Cancer. A shocking one in nine men will get prostate cancer; The Prostate Cancer Charity fights to help more men survive and enjoy a better quality of life.

Members from across the Keyline group – one of the largest suppliers to UK building and construction industries – embarked on a 96 hour return trip rally from Northfleet, Kent, to Blofeld’s secret allergy research centre in the Swiss Alps. With a 007 theme, the sponsored car was a BMW Z3, a car from the James Bond movie Goldeneye.

Winn & Coales (Denso) Ltd, originally established in 1883, are well known for the reliability, efficiency and longevity of their products and have built an excellent reputation based on problem solving for their customers. Apart from the UK, they also have subsidiaries in America, Canada, Australia and South Africa as well as a global network of over 70 agents making their products available virtually anywhere in the world.

For further information contact: Winn & Coales (Denso) Ltd., Chapel Road, London SE27 0TR Tel: 0208 6707511. Fax: 0208 7612456 e-mail: mail@denso.net. Web: www.denso.net

SPECIALIST SEALANT FOR SERVICE DUCTS AT NEW CO-OP HQ

BAM Construction Ltd NW has designed and nearing contract completion of the new prestigious headquarters for the Co-operative Group in Manchester. The Headquarters is Phase 1 of the £800m NOMA scheme in Manchester City Centre demonstrating the Co-operative Groups commitment to the City of Manchester.

BAM Construction Ltd NW specified Winn & Coales (Denso) Ltd’s specialist Densoseal 16A for sealing all electrical service cables ducts, with diameters of up to 300mm, in the external basement and lower ground floor walls.

Densoseal 16A is a non-setting, self-supporting mastic which may be applied to wet surfaces and will seal ducts and conduits against ingress of water and gas. It complies with British Telecom Specification M212C. It is suitable for sealing cable ducts, conduits and service entry pipes or sleeves, particularly below ground level, to prevent entry of water or gas into buildings. It may also be used for profiling mechanical joints on hot pipes to allow application of tapes.

For further information contact: Winn & Coales (Denso) Ltd., Chapel Road, London SE27 0TR Tel: 0208 6707511. Fax: 0208 7612456 e-mail: mail@denso.net. Web: www.denso.net
**CATHODIC PROTECTION CONSULTANCY SERVICES**

**BEASY**
Ashurst Lodge, Ashurst, Southampton, Hants, SO40 7AA
Tel. 02380 293223 Fax: 02380 292853
e: t.froome@beasy.com www.beasy.com

**CORROSION CONTROL**
3 Ivy Court, Acton Trussell, Staffordshire ST17 0SN
Tel: 01785 711560 Fax: 01785 711156
Email: brianwyatt@controlcorrosion.co.uk
www.controlcorrosion.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**
76A Gardner Road, Formby, Merseyside L37 8DQ
Tel: 07717 487632 Fax: 01704 380194
Email: pmsmith@protechcp.com
www.protechcp.com

**CATHODIC PROTECTION AND MONITORING**

**ADVANCED TECHNICAL ENGINEERING SERVICES**
Room 811, Tsimshatsui Center (East Wing)
66 Mody Road, Kowloon, SAR Hong Kong
Tel: 852-23693399
Email: ates1003@yahoo.com.hk

**3C CORROSION CONTROL COMPANY**
Box 72, Billberga, Sweden 268 03
Tel: +46 418 411 900
Email: ino@3ccc.se
Website: www.3ccc.se

**BAC CORROSION CONTROL LTD**
CATHODIC PROTECTION AND PIN BRAZING PRODUCTS & SERVICES
Stafford Park 11, Telford, Shropshire, TF3 3AY UK
sales@bacgroup.com www.bacgroup.com
Tel: +44 (0) 1952 290321 Fax: +44 (0) 1952 290325

**CATHODIC PROTECTION CO LIMITED**
55 YEARS OF EXCELLENCE
- Transformer Rectifiers, CP Materials & Design
- "ELGARD" MMO mesh anode licensed supplier,
  "CUPRION" Marine Anti Fouling
"THE ONE STOP CP SHOP"
Venture Way, Clactham, Lincolnshire NG31 7HS
Tel: +44 (0) 1476 590666 Fax: +44 (0) 1476 570605
Email: cpc@cathodic.co.uk www.cathodic.co.uk

**CATHELCO**
Marine House, Dunston Road, Chesterfield S41 8NY
Tel: +44 (0) 1246 457900 Fax: +44 (0) 1246 457901
Email: sales@cathelco.com www.cathelco.com

**CORROCELL LIMITED**
17 South Meadow, Maghull, Liverpool L31 8EG
Tel: 0151 249 8461 Fax: 087087 92585
Email: dp@corrocell.co.uk

**Corrosion Control Services Ltd.**
SPECIALISTS IN CATHODIC PROTECTION
Innovation House, Euston Way,
Town Centre, Telford TF3 4LT
Tel: 01952 230900 Fax: 01952 230906
www.corrosioncontrolservices.co.uk

**CORRPRO COMPANIES EUROPE LTD**
Corrosion Engineering, Cathodic Protection,
Corrosion Monitoring
Cathodic Protection House, 4 Mill Court,
The Sawmills, Durley, Southampton SO32 2EJ
Tel: +44 (0) 1489 861980 Fax: +44 (0) 1489 861981
Email: ccel@corrpro.co.uk

**DEEPWATER**
Offshore corrosion control
Deepwater EU Ltd,
Oak House, Tanshire Park, Shackleford Road,
Elstead, Surrey, GU8 6LB
Tel: +44 (0) 1483 600482
www.stoprust.co.uk
SUSTAINING MEMBERS

COATING APPLICATORS

ALFRED BAGNALL & SONS LTD
6 Manor Lane, Shipley, W.Yorks BD18 3RD
Tel: 01274 714800 Fax: 01274 530171
Email: info@bagnalls.co.uk www.bagnalls.co.uk

APB CONSTRUCTION (UK) LTD
Unit 3 Bramley Way, Hellaby Industrial Estate
Hellaby, Rotherham South Yorkshire S66 8Q8
Tel: 01709 541000 Fax: 01709 541411
Email: gary.bentham@apbcon.co.uk

APB GROUP LIMITED
Ryandra House, Ryandra Business Park, Brookhouse Way, Cheadle, Stoke on Trent ST10 1SR
Tel: 01538 755377 Fax: 01538 755010

BEN FALLOWS PAINTING & DECORATING LTD
72 Broadgate lane, Deeping St. James, Peterborough PE6 8NN
Tel: 01778 343391
Email: ben@benfallowspaintingdecorating.co.uk
www.benfallowspaintingdecorating.co.uk

COASTAL PRESERVATION SERVICES LTD
Unit 15 Nanesden, racecourse, walsops wood
Sheardley Lane, Droxford, Hampshire SO32 3QY
Tel: 01489 878845 Fax: 01489 878846
Email: coastal.preservation@btinternet.com
www.coastalpreservation.com

COATING APPLICATORS

F A CLOVER & SON LTD
INDUSTRIAL PAINTING CONTRACTORS SINCE 1917
Tel: 020 89486321 Fax: 020 89487307
Email: ian@cloverpainting.com

FAIRHURST WARD ABBOTS LTD
225 London Road, Greemhithe, Kent DA9 9RR
Tel: +44 (0)1322 387 000 Fax: +44 (0)1322 370235
Email: works@fwadart.co.uk Website: fwagroup.co.uk

GABRE (UK) LTD
9 Holme Road, Curraghmulkin, Dromore, Tyrone BT78 3BX
Tel: 02882897950 Fax: 02882898303
Email: info@galcosteel.ie

GEMINI CORROSION SERVICES LTD
Brent Avenue, Forties Road, Montrose, Angus, DD10 9PB
Tel: 01674 672 678 Fax: 01674 672 1111

GPL SPECIAL PROJECTS LTD
PO Box 516, Salford, M5 0BJ
Tel: 0161 745 7888 Email: ben@gplcivils.co.uk

HALLKINSON PAINTING GROUP Blasting & Protective Coatings Division

- Blasting
- Scaffolding and encapsulation
- ISO9001 and NHSS19A accredited
- ISO14001 accredited
- Award winning safety and training standards
- National coverage

HERRINGTON INDUSTRIAL SERVICES LTD
GRITBLASTING, METAL SPRAYING & APPLICATIONS OF SPECIALISED COATINGS
Crown Works, Crown Road, Low Southwick, Sunderland, Tyne & Wear, SR5 2BS
Tel: 0191 516 0634 Fax: 0191 548 1553
e: herringtonltd@gmail.com Website: www.herringtonltd.co.uk

Reader Enquiry: CM015

DRH Coatings Ltd
Suite 5, 3 Shawcross Industrial Estate,
Hilsea, Portsmouth, PO3 5JP
Tel: 0239 2666165
Email: garydeeks@drhcoatings.co.uk

DYER & BUTLER LTD
Mead House, Station Road, Nursling, Southampton, Hampshire SO16 0AH
Tel: 02380 742222 Fax: 02380 742200
Email: enquiries@dyerandbutler.co.uk
Website: www.dyerandbutler.co.uk

HERRINGTON INDUSTRIAL SERVICES LTD
GRITBLASTING, METAL SPRAYING & APPLICATIONS OF SPECIALISED COATINGS
Crown Works, Crown Road, Low Southwick, Sunderland, Tyne & Wear, SR5 2BS
Tel: 0191 516 0634 Fax: 0191 548 1553
e: herringtonltd@gmail.com Website: www.herringtonltd.co.uk
**COATING APPLICATORS**

**IMPACT**

**INDUSTRIAL SUPPORT SERVICES LTD**
Specialists in Abrasive Blast Cleaning, UHP Water Blasting, Coating Application, Hydro Demolition, Project Management.
Building S146, South Yard, HMMNB Devonport, Plymouth PL2 2BG
Tel: 01752 552515 Fax: 01752 554607 Mobile: 07979 516427

**H & P PAINTING CONTRACTORS LTD**
4 Hamilton Gardens, Mutley, Plymouth, PL4 6PQ
Tel/Fax: 07837 382619

**ICS Industrial Coating Services**
Are expanding rapidly...
We have an excellent well trained, motivated and highly accredited workforce. Delivering high quality projects. Completed within time frames and on budget.

**Training**
- Confined space
- PTS/D555
- ICATE
- ICOM Paint Inspector
- S Gulf 102
- First Aid – 4 day
- SMSTS
- ISSS
- PASMA
- IPAF
- NEBOSH

**Accreditations**
- UVDB
- PAS 19A
- Constructionline
- ISO 9001
- Link-up
- CHAS 18001

**Services**
- Surface preparation
- Protective Coating Application
- Scaffold and Encapsulation
- Graffiti removal / anti-graffiti coating
- High pressure water jetting

**JPV LTD**
Over 30 years experience of Preparation & Coating Abrasive Blasting, Specialist Coating Applications, High Pressure Water Jetting.
Tel: 01277 201515 Fax: 01277 201616 E: paul.jpv@btopenworld.com

**KUE Group Limited**
Birsksland Street, Bradford BD3 9SU
Tel: +44 (0)1274 721188 Fax: +44 (0)1274 720088 Website: www.kuegroup.com

**MABEY BRIDGE LIMITED**
Station Road, Chepstow, Monmouthshire NP16 5YL
Tel: +44 (0)1291 623801 Fax: +44 (0)1291 625453 Email: mail@mabeybridge.co.uk

**MARK SMITH INSPECTION SERVICES LTD**
14 Seabank Close, South Shields, Tyne & Wear NE34 7ER
Tel: 07760 175446 Email: mark@marksmitinspectionservices.com

**MCL COATINGS LTD**
Pickerings Road, Halebank Industrial Estate
Widnes, Cheshire WA8 8XW
Tel: 0151 423 6166 Fax: 0151 495 1437 Email: info@mcl.eu.com Website: www.mcl.eu.com

**MONA LIFTING LTD**
Unit 5 Parc Byn Cefni, Llangefni, Anglesey LL77 7XA
Tel: 01248 751300 Email: info@monalifting.co.uk Website: www.monalifting.com

**MPM NORTH WEST LTD**
Marine Road, Maryport, Cumbria CA15 8AY
Tel: 01900 810299 Email: mikej@mpmmarine.co.uk Website: www.mpmmarine.co.uk

**NORTHERN PROTECTIVE COATINGS LTD**
16 High Reach, Fairfield Industrial Estate, Bill Quay, Gateshead, Tyne & Wear NE10 0UR
Tel: 0191 438 5555 Fax: 0191 438 3082 Email: jack.welsh@npcoatings.co.uk Website: www.npcoatings.co.uk

**NUSTEEL STRUCTURES**
Unit 3, Ringside Business Park, Heol-Y-Rhosog, Cardiff CF3 2EW
Tel: 029 2077 7070 Fax: 029 2036 3023 Email: port.painters@talk21.com

**ORRMAC COATINGS LTD**
Marine Road, Maryport, Cumbria CA15 8AY
Tel: 0191 438 5555 Fax: 0191 438 3082 Email: jack.welsh@npcoatings.co.uk Website: www.npcoatings.co.uk

**OPUS INDUSTRIAL SERVICES LIMITED**
Ethan House, Royce Avenue, Cowpen Lane Industrial Estate,Billingham TS23 4BX
Tel: 01642 371850 Fax: 01642 562971 Website: www.opus-services.com

**PIPELINE INDUCTION HEAT LTD**
The Pipeline Centre
Farrington Road, Rossendale Road Industrial Estate
Burnley, Lancs BB11 5SW
Tel: 01254 215323 Fax: 01254 215326 Email: Sales@pih.co.uk Website: www.pih.co.uk

**PIPERCREST LTD**
T/A Halls Specialised Services
Brooklyn Farm, North Hill, Norden on the Hill, Essex SS17 8QA
Tel: 01375 361408 Fax: 01375 361448 Email: halls@btconnect.com

**PORT PAINTERS LTD**
Unit 3, Ringside Business Park, Heol-Y-Rhosog, Cardiff CF3 2EW
Tel: 029 2077 7070 Fax: 029 2036 3023 Email: port.painters@talk21.com
CARBOLINE
Offshore and Onshore protection, Waste water treatment plants, Specialist pipeline treatments, Environmentally friendly products
Tel: 07712 768411 Fax: 01475 529893 www.carboline-europe.com

CHEMCO INTERNATIONAL LTD.
INNOVATIVE RUST & WET-TOLERANT, SOLVENT-FREE COATINGS
East Shawhead Industrial Estate, Coatbridge, Scotland, UK
Tel: 01236 606060 Fax: 01236 606070 Email: sales@chemcoint.com www.chemcoint.com

CORROCOAT CORROSIONEERING
• Extensive range of high technology coating systems and composites
• Specific range of coating systems
• Focus on R&D and technical support
• Low VOC levels with little or no solvent content for reduced atmospheric pollution
• Effective single coat solutions available
• Increasingly specified as the industry standard

COUNTER CORROSION LTD
Formulators and Applicators of Customised Protective Coating and Lining Systems for Steel and Concrete
Tel: 01924 468559/380002 Fax: 01924 458019

HEMPEL PAINTS LTD
Llantarnam Industrial Park
CWMBRAN
Gwent NP44 3XF
Tel: 01633 874024 Fax: 01633 489012 Email: sales@hempel.co.uk www.hempel.com

INDEPENDENT PROTECTIVE COATINGS SERVICES LTD
IPCS House, 32 Daryngton Avenue, Birchington, Kent, CT7 9PS
Tel: 01843 845472 Fax: 01843 847722

INTERNATIONAL PAINT LIMITED
Stoneygate Lane, Felling, Gateshead, Tyne & Wear NE10 0JY
Tel: 0191 469 6111 Fax: 0191 496 0676 Email: simon.daly@internationalpaint.com Website: www.international-pc.com

JOTUN PAINTS (EUROPE) LTD.
Stather Road, Flixborough, Scunthorpe, North Lincolnshire DN15 8RR
Tel: 01724 400 125 Fax: 01724 400 100 Email: decpaints@jotun.co.uk www.jotun.co.uk

LEIGHS PAINTS
NOW A PART OF THE SHERWIN-WILLIAMS COMPANY
Tower Works, Kestor Street, Bolton BL2 2AL
Tel: 01204 521771 Fax: 01204 382115 www.leighspaints.com

PPG PROTECTIVE & MARINE COATINGS
Unit 3 Maises Way, The Village, Carter Lane, South Normanton, Derbyshire DE55 2DS
Tel: +44 (0) 1773 814520 Fax: +44 (0) 1773 814521 Web: www.ppgpmc.com

SPENCER COATINGS LTD
Froghall Terrace, Aberdeen, AB24 3JN
Tel: 01224 788400 Fax: 01224 648116 Website: www.spencercoatings.co.uk

SPECIALTY POLYMER COATINGS INC
64 Tudor Avenue
Worcester Park
Surrey KT4 8TX
Tel: 020 8337 4953 Fax: 020 8337 4953 Website: www.spc-net.com

STORK TECHNICAL SERVICES (RGB LTD)
Norfolk House, Pitmedden Road, Dyce, Aberdeen AB21 0EW
Tel: 01224 722888 Fax: 01224 723406 Email: Fraser.coull@rgb.com Website: www.rgbtltd.com

TINSLEY SPECIAL COATINGS
Enterprise House, Durham Lane, Eaglescliffe TS16 0PS
Tel: 01642 784279 Fax: 01642 782891 Email: enquiries@tinsleyspecialproducts.com
External Corrosion Management Ltd, suites 5 & 6, 221-229 Union street, Aberdeen AB10 6BQ
Tel: 01224 621915 (ext119)   Fax: 01224 621215
Website: www.metacor.co.uk

DOORBOS EQUIPMENT
Tel: 01642 673931   Fax: 01642 673210
Email: sales@doorbosenquipment.co.uk
Website: www.doornbosequipment.co.uk

FERNOX
MAKES WATER WORK
Cookson Electronics, Forsyth Rd, Woking, Surrey GU21 5RZ
Tel: 01483 793200   Fax: 01483 793201   www.fernox.com

FM CONWAY LTD
Conway House, Rochester Way, Dartford, Kent DA1 3QY
Tel: 0208 6368822   Fax: 0208 6368827
Email: sharon.howlett@fmconway.co.uk

GMA GARNET (EUROPE) GMBH
PO Box 9, Middlewich, Cheshire, CW10 9FD
Tel: 01606 836233   Fax: 01606 836610
www.gmagarnet.co.uk

INTERTEK COMMERCIAL MICROBIOLOGY LTD
Tel: 01224 706062   Fax: 01224 706012
Email: cmlenquiries@intertek.com
Website: www.intertek.com

JETCHEM SYSTEMS LIMITED
Cuba Industrial Estate, Stubbins, Ramsbottom, Lancashire BL0 0NE
Tel: 01706 828 888   Fax: 01706 828 000
Email: sales@jetchem.com   Website: www.jetchem.com

METACOR
External Corrosion Management Ltd, Suites 5 & 6, 221-229 Union Street, Aberdeen AB10 6BQ
Tel: 00 44 1224 621915 (ext119)   Fax: 00 44 1224 621215
www.metacor.co.uk

ROLLED ALLOYS LTD
Park Works, Newton Heath, Manchester M40 2BA
Tel: 0161 9544213   Fax: 0161 2054739

SCANGRIT
Eastfield Road, South Killingholme, Immingholme, Immingham, North Lincs DN40 3NF
Tel: 01469 574715   Fax: 01469 571644
Email: sales@scangrit.co.uk   Website: www.scangrit.co.uk

STORK TECHNICAL SERVICES UK LTD
1 Minto Place, Altens Industrial Estate, Aberdeen, AB12 3SN
Tel: 01224 898282   Fax: 01224 898202
Email: info@stork.com   www.storktechnicalservices.com

ELSEVIER SCIENCE LTD
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GD
Tel: 01865 843000   Fax: 01865 843010

INSTITUTE OF METAL FINISHING
Exeter House, 48 Holloway Head, Birmingham B1 1NQ
Tel: 0121 6227387   Fax: 0121 6666316
Email: exeterhouse@instituteofmetalfinishing.org
www.uk-finishing.org.uk

MPI GROUP
Peel House, Upper South View, Farnham, Surrey GU9 7JN
Tel: 01252 732220   Fax: 01252 732221
www.protectivecoatingseurope.com

ARGYLL-RUANE LTD
Meadowbank Rd, Rotherham, South Yorkshire S61 2NF UK
Tel: +44 (0)1709 560459   Fax: +44 (0)1709 557705
E-mail: enquiries@ruanetpo.com
Website: www.argyllruanne.com

GMA GARNET (EUROPE) GMBH
PO Box 9, Middlewich, Cheshire, CW10 9FD
Tel: 01606 836233   Fax: 01606 836610
www.gmagarnet.co.uk

INTERTEK COMMERCIAL MICROBIOLOGY LTD
Tel: 01224 706062   Fax: 01224 706012
Email: cmlenquiries@intertek.com
Website: www.intertek.com

JETCHEM SYSTEMS LIMITED
Cuba Industrial Estate, Stubbins, Ramsbottom, Lancashire BL0 0NE
Tel: 01706 828 888   Fax: 01706 828 000
Email: sales@jetchem.com   Website: www.jetchem.com

METACOR
External Corrosion Management Ltd, Suites 5 & 6, 221-229 Union Street, Aberdeen AB10 6BQ
Tel: 00 44 1224 621915 (ext119)   Fax: 00 44 1224 621215
www.metacor.co.uk

ROLLED ALLOYS LTD
Park Works, Newton Heath, Manchester M40 2BA
Tel: 0161 9544213   Fax: 0161 2054739

SCANGRIT
Eastfield Road, South Killingholme, Immingholme, Immingham, North Lincs DN40 3NF
Tel: 01469 574715   Fax: 01469 571644
Email: sales@scangrit.co.uk   Website: www.scangrit.co.uk

STORK TECHNICAL SERVICES UK LTD
1 Minto Place, Altens Industrial Estate, Aberdeen, AB12 3SN
Tel: 01224 898282   Fax: 01224 898202
Email: info@stork.com   www.storktechnicalservices.com

ELSEVIER SCIENCE LTD
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GD
Tel: 01865 843000   Fax: 01865 843010

INSTITUTE OF METAL FINISHING
Exeter House, 48 Holloway Head, Birmingham B1 1NQ
Tel: 0121 6227387   Fax: 0121 6666316
Email: exeterhouse@instituteofmetalfinishing.org
www.uk-finishing.org.uk

MPI GROUP
Peel House, Upper South View, Farnham, Surrey GU9 7JN
Tel: 01252 732220   Fax: 01252 732221
www.protectivecoatingseurope.com

ARGYLL-RUANE LTD
Meadowbank Rd, Rotherham, South Yorkshire S61 2NF UK
Tel: +44 (0)1709 560459   Fax: +44 (0)1709 557705
E-mail: enquiries@ruanetpo.com
Website: www.argyllruanne.com
### ICATS REGISTERED COMPANIES WITH QUALIFIED APPLICATORS

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alltask Limited</td>
<td>Alltask House, Commissioners Road, Strood, Kent, ME2 4EJ</td>
<td>01634 298000</td>
</tr>
<tr>
<td>Alfred Bagnall &amp; Sons</td>
<td>6 Manor Lane, Shipley, West Yorkshire, BD18 3RD</td>
<td>01302 853259</td>
</tr>
<tr>
<td>APB Construction (UK)</td>
<td>Unit 3, Bramley Way, Hellaby Industrial Estate, Hellaby, Rotherham, S. Yorkshire, S66 8QB</td>
<td>01709 541000</td>
</tr>
<tr>
<td>APB Group Limited</td>
<td>Ryandra House, Ryandra Business Park, Brookhouse Way, Cheadle, Staffs, ST10 1SR</td>
<td>01538 755377</td>
</tr>
<tr>
<td>Armourcote Surface Technology Plc</td>
<td>15/17 Colvilles Place, Kelvin Industrial Estate, East Kilbride, Scotland, G75 0PZ</td>
<td>01355 248223</td>
</tr>
<tr>
<td>Austin Hayes Ltd</td>
<td>Carlton Works, Cemetry Road, Yeadon, Leeds, LS19 7BD, UK</td>
<td>0113 250 2255</td>
</tr>
<tr>
<td>B&amp;A Contracts Ltd</td>
<td>Dale Road, Hubberston, Milford Haven, Pembrokeshire SA73 3PR</td>
<td>01646 693489</td>
</tr>
<tr>
<td>BAE Systems Surface Ships Support Ltd</td>
<td>Room 213, Naval Base Headquarters, Building 1/100, PP127, Portsmouth, PO1 3LS</td>
<td>01132857279</td>
</tr>
<tr>
<td>Barrier Ltd</td>
<td>Stephenson Street, WallSEND, Tyne &amp; Wear, NE28 6UE, UK</td>
<td>0191 262 0510</td>
</tr>
<tr>
<td>Beever Limited</td>
<td>Little Coldharbour farm, Tong Lane, Lamberhurst, Kent, TN3 8AD, UK</td>
<td>01892 890045</td>
</tr>
<tr>
<td>Ben Fallows Painting &amp; Decorating Ltd</td>
<td>72 Broadgate Lane, Deeping St James, Peterborough, PE6 8NN</td>
<td>01778 343391</td>
</tr>
<tr>
<td>Briton Fabricators Ltd</td>
<td>Watnall Road, Hucknall, Notts, NG15 6EP</td>
<td>0115 963 2901</td>
</tr>
<tr>
<td>Cape Industrial Services</td>
<td>Cape House, 3 Red Hall Avenue, Paragon Business Village, Wakefield, WF1 2UL</td>
<td>01224 215800</td>
</tr>
<tr>
<td>Carrodus Contractors Ltd</td>
<td>Unit 134, Medway Enterprise Centre, Enterprise Close, Strood, Kent, ME2 4SY</td>
<td>01634 271786</td>
</tr>
<tr>
<td>Cleveland Bridge UK Ltd</td>
<td>Cleveland House, Yarm Road, Darlington, DL1 4DE</td>
<td>01325 502345</td>
</tr>
<tr>
<td>Coating Services Ltd</td>
<td>Partington Street, Mumps Bridge, Oldham, OL1 3RU, UK</td>
<td>0161 665 1998</td>
</tr>
<tr>
<td>Collis Engineering Railway Contracts</td>
<td>Salcombe Road, Meadow Lane Industrial Estate, Alfreton, Derbyshire, DE55 7RG</td>
<td>01773 833255</td>
</tr>
<tr>
<td>Community Clean</td>
<td>11 Old Forge Road, Ferndown Industrial Estate, Ferndown, Wimborne, Dorset, BH21 7RR, UK</td>
<td>0845 6850133</td>
</tr>
<tr>
<td>Corrocoat</td>
<td>Forster Street, Leeds, LS10 1PW</td>
<td>01132760760</td>
</tr>
<tr>
<td>Denholm Industrial</td>
<td>21 Boden Street, Glasgow, G40 3PU</td>
<td>0141 445 3939</td>
</tr>
<tr>
<td>DRH Coatings Ltd</td>
<td>Suite S, 3 Shawcross Industrial Estate, Ackworth Road, PONTHOM PO3 5JP</td>
<td>023 9266 6165</td>
</tr>
<tr>
<td>Dyer &amp; Butler Ltd (Rail)</td>
<td>Mead House, Station Road, Nursling, Southampton, SO16 0AH, UK</td>
<td>02380 667549</td>
</tr>
<tr>
<td>ENC (Yorkshire) Ltd</td>
<td>Unit 3B Rotherham Road, Dinnington Sheffield, S25 3RF</td>
<td>01909 567860</td>
</tr>
<tr>
<td>E P Painting Ltd</td>
<td>Rossfield Road, Rossfield Trading Estate Elesmere Port, Cheshire CH65 3AW</td>
<td>0151 355 8141</td>
</tr>
<tr>
<td>F A Clover &amp; Son</td>
<td>Bardolph Road, Richmond, Surrey, TW2 2LH</td>
<td>0208 948 6321</td>
</tr>
<tr>
<td>Ferrous Protection Ltd</td>
<td>Hanson House, Grains Road, Delph, Oldham OL3 5RN</td>
<td>01457 873419</td>
</tr>
<tr>
<td>Forth Estuary Transport Authority</td>
<td>Forth Road Bridge, Administration Office South Queensferry, EH30 9SF</td>
<td>0131 319 1699</td>
</tr>
<tr>
<td>GABRE (UK) LTD</td>
<td>9 Holme Road, Dromore, Omagh Co Tyrone, BT78 3BX</td>
<td>02882 897950</td>
</tr>
<tr>
<td>GPL Special Projects Ltd</td>
<td>PO Box 516, Salford, M5 0BJ</td>
<td>0161 7457888</td>
</tr>
<tr>
<td>H&amp;H Painting Contractors Ltd</td>
<td>4 Hamilton Gardens, Mutley, Plymouth, PL4 6PQ</td>
<td>07837 382619</td>
</tr>
<tr>
<td>Harsco Infrastructure Services Ltd</td>
<td>Unit 3 Manby Road, South Killingholme, Immingham, North Lincolnshire, DN40 3DX</td>
<td>01469 553800</td>
</tr>
<tr>
<td>Harrisons Engineering Lancashire Ltd</td>
<td>Judge Wilmey Mill, Longworth Road Billington, Clitheroe, Lancashire, BB7 9TP</td>
<td>01254 823993</td>
</tr>
<tr>
<td>HBS Protective Coatings Ltd</td>
<td>40 Manse Road, Belfast BT8 6SA</td>
<td>028 90708280</td>
</tr>
<tr>
<td>Herrington Industrial Services Ltd</td>
<td>Crown Works, Crown Road, Low Southwick, Sunderland SR5 2BS</td>
<td>0191 5160634</td>
</tr>
<tr>
<td>Hi-Tech Surface Treatment Ltd</td>
<td>Unit B, Deacon Trading Estate, Chickenhall Lane, Eastleigh, Hants SO50 6RP</td>
<td>023 80611789</td>
</tr>
</tbody>
</table>
Hyspec Services Ltd
Unit 3 Meadowfield Industrial Estate, Cowdenbeath Road, Burntisland, Fife, KY3 0LH
T: 01592 874661

Industrial Coating Services
5 Danesbury Crescent, SandBeds Trading Estate, Dewsbury Road, Ossett, WF5 5ND
T: 01924 272606

International Energy Services Ltd
94 Awolowo, Ikoyi, Lagos State, Nigeria
T: 014615636

Interserve Industrial
Unit 2 Olympic Park, Poole Hall Road, Ellesmere Port, Cheshire, CH66 1ST
T: 0151 3737660

J Murphy & Sons Ltd
Hiview House, Bells Gate, London NW5 1TN
T: 020 7267 4366

Jack Tighe Coatings
Sandall Lane, Kirk Sandall, Doncaster, DN3 1QR
T: 01302 880360

Jack Tighe Ltd
Redbourne Mere, Kirton Lindsey, Gainsborough, Lincs, DN21 4NW, UK
T: 01652 640003

JVP (Painters) Ltd
Unit 8 Prospect Way, Hutton Industrial Estate, Brentwood, Essex, CM13 1XA, UK
T: 01277 201515

Lanarkshire Welding Co.
82 John Street, Wishaw, Lanarkshire, ML2 7TQ
T: 01698 264271

Mabez Bridge Ltd
Station Road, Chepstow, Monmouthshire NP16 5YI
T: 01291 623801

Maclean & Speirs Blasting Ltd
Unit D, East Fulton Farm, Darlitho Road, Linwood, Paisley PA3 3TP
T: 01505 324777

MCL Coatings Ltd
Pickerings Road, Halebank Industrial Estate, Widnes, Cheshire, WA8 8XW
T: 0151 423 6166

NSG UK Ltd
Fourth Avenue, Deeside Industrial Park, Deeside, Flintshire CH5 2NR
T: 01244 833138

Northen Protective
16 High Reach, Fairfield Industrial Estate, Bill Quay, Gateshead, Tyne & Wear, NE10 0UR
T: 0191 438 5555

Nusteel Structures
Lympe Industrial Estate, Lympe, Hythe, Kent, CT21 1LR
T: 01303 268112

Offshore Marine Services Ltd
Brumby House, Jalan Bahasa, PO Box 80148, 87011 Lubuan F.T. Malaysia
T: +356214244410

Opus Industrial Services
Ethan House, Roys Lane, Cowpen Industrial Estate, Billingham, TS23 4BX, UK
T: 01642 371850

Orrmarc Coatings Ltd
Newton Chambers Road, Thornecliffe Park Estate, Chapeltown, Sheffield, S25 2PH
T: 0114 246 1237

Paintel Ltd
Trianon, Westover, Ivybridge, Devon, PL21 9JH
T: 01752 719 701

PCM Nigeria Plc
99 Rivoc Road Trans Amadi, Port Harcourt, Rivers State, Nigeria
T: +2348035297928

PH Shotblasting & Spraying Services
43a Drumraine Road, Castlecumfield, Dungannon, Co Tyrone, BT70 3NY
T: 028 8776 7772

Port Painters Limited
Unit 3, Ringside Business, Hoel-Y-Rhosog Cardiff, CF3 2EWX
T: 02920 777070

Pyeroy Limited
Kirkstone House, St Omeres Road, Western Riverside Route, Gateshead, Wear, NE11 9EZ
T: 0191 4932600

Roy Hankinson Limited
Alexander House, Monks Ferry, Birkenhead Wirral, CH41 5LH
T: 0870 7892020

Rhinoceros Limited
Huntingdon Works, East Finchley, London, N2 9DX
T: 0208 444 6165

Rowecord Engineering
Neptune Works, Usk Way, Newport, South Wales NP20 2SS
T: 01633 250511

Shutdown Maintenance Services Ltd
Kingsnorth Industrial, Hoo, Rochester, Kent, ME3 9ND
T: 01634 256969

Solent Protective Coatings Ltd
Tredgar Wharf, Marine Parade, Southhampton, Hants, SO14 3JF
T: 02380 221480

South Staffs Protective Coatings Ltd
Bloomfield Road, Tipton, West Midlands, DY4 9EE
T: 0121 522 2373

Standish Metal
Potter Place, West Pimbo, Skelmersdale, Lancs, WN8 9PW, UK
T: 01695 455977

Stobbarts Ltd
Tarn Howe, Lakes Road, Derwent Howe Industrial Estate, Workington, Cumbria CA14 3YP
T: 01900 870780

Supablack (1984) Ltd
Jubilee Estate, Gorseby Lane, Coleshill, Birmingham, B46 1JU
T: 01675 464446

T I Protective Coatings
Unit 6, Lodge Bank, Crown Lane, Horwich, Bolton, Lancs, BL6 5HU
T: 01204 468080

TEMA Engineering Ltd
5-6 Curran Road, Cardiff, CF10 5DF, UK
T: 020920 344556

TEM Engineering Ltd
5-6 Curran Road, Cardiff, CF10 5DF, UK
T: 020920 344556

 Vale Protective Coatings Ltd
Building 152 - Langar North Industrial Estate, Harby Road, Langar, NG13 9HY
T: 01949 869784

Walker Construction (UK) Ltd
Park Farm Road, Folkestone, Kent, CT19 5DY
T: 01303 851111
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wardle Painters Ltd</td>
<td>Unit 5, Wimborne Building, Atlantic Way, Barry Docks, Glamorgan, CF63 3RA, UK</td>
<td>T: 01446 748620</td>
</tr>
<tr>
<td>W G Beaumont &amp; Son</td>
<td>Beaumont House, 8 Bernard Road, Romford RM7 0HX</td>
<td>T: 01708 749202</td>
</tr>
<tr>
<td>William Hare Ltd</td>
<td>Brandleholme House, Brandleholme Road, Barry Docks, Glamorgan, BL8 1JJ, UK</td>
<td>T: 0161 609 0000</td>
</tr>
<tr>
<td>Xervon Palmers Ltd</td>
<td>331 Charles Street, Royston, Glasgow G21 2QA</td>
<td>T: 01451 534040</td>
</tr>
<tr>
<td>ICATS REGISTERED COMPANIES WITH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPICATORS IN TRAINING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D&amp;D Rail Ltd</td>
<td>Time House, Time Square, Basildon Essex SS14 1DJ</td>
<td>T: 01268 250000</td>
</tr>
<tr>
<td>Donyal Engineering Ltd</td>
<td>Hobson Industrial Estate, Burnopfield, Newcastle Upon Tyne NE16 6EA</td>
<td>T: 01207 270909</td>
</tr>
<tr>
<td>E G Lewis &amp; Company Ltd</td>
<td>Suite 3, 3 Shawcross Industrial Estate, Ackworth Road, Portsmouth PO3 5JP</td>
<td>T: 01792 323288</td>
</tr>
<tr>
<td>Gemini Corrosion Services</td>
<td>Brent Avenue, Forties Road, Montrose, Angus, DD10 9NB</td>
<td>T: 01674 672 678</td>
</tr>
<tr>
<td>Over Rail Services Ltd</td>
<td>Unit 10 Millhead Way, Purdys Industrial Estate, Rochford, Essex, SS4 1ND</td>
<td>T: 07976372866</td>
</tr>
<tr>
<td>Severn River Crossing Plc</td>
<td>Bridge Access Road, Aust, South Gloucestershire, BS35 4BD</td>
<td>T: 01454 633351</td>
</tr>
<tr>
<td>Specialist Blasting Services Ltd</td>
<td>Smiths Quay, Hazel Road, Woolston, SO19 7GB</td>
<td>T: 023 80438901</td>
</tr>
<tr>
<td>Tees Valley Coatings</td>
<td>Riverside Park Road, Middlesbrough, Cleveland TS2 1UT</td>
<td>T: 01642 228141</td>
</tr>
<tr>
<td>ICATS REGISTERED COMPANIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbey Gritblasting Services</td>
<td>Unit 13, Clifton Commercial Park, Clifton, Woodbridge, Suffolk, IP12 3TP</td>
<td>T: 0191 262 0510</td>
</tr>
<tr>
<td>Advanced Construction and</td>
<td>First Floor, Regus House, Herons Way, Chester Business Park, Chester CH4 9QR</td>
<td>T: 01244 893113</td>
</tr>
<tr>
<td>BAM Nuttall Ltd</td>
<td>St James House, Knoll Road, Camberley GU13 3XW</td>
<td>T: 0782 5798440</td>
</tr>
<tr>
<td>Celtic Specialist Treatments Ltd</td>
<td>Rosedale, Carelliken Lane, Langstone Newport, Gwent, NP18 2JZ</td>
<td>T: 01633 400194</td>
</tr>
<tr>
<td>Centrereat Engineering Ltd</td>
<td>11/12 Wyndham Close, Brackla, Brackla Industrial Estate, Bridgend, CF31 2AD</td>
<td>T: 01656 650481</td>
</tr>
<tr>
<td>Coastground Ltd</td>
<td>Morton Peto Road, Capton Hall Industrial Estate, Great Yarmouth, Norfolk, NR31 0LT</td>
<td>T: 01493 650455</td>
</tr>
<tr>
<td>Excel Contractors Ltd</td>
<td>11a West End Road, Bitteme, Southampton SO18 6TE</td>
<td>T: 02380 444420</td>
</tr>
<tr>
<td>Forward Protective</td>
<td>Vernon Street, Shirebrook, Mansfield Notts, NG20 8SS</td>
<td>T: 01623 748323</td>
</tr>
<tr>
<td>Gallidris Construction Ltd</td>
<td>Gallidris House, Pavillion Business Centre, Kinetic Crescent, Innova Science Park, Enfield BN3 7FJ</td>
<td>T: 01992 763000</td>
</tr>
<tr>
<td>G W Burton Ltd</td>
<td>New Court, Wooddalling, Norwich, Norfolk, NR11 6SA</td>
<td>T: 01263 584203</td>
</tr>
<tr>
<td>Hempeil UK Ltd</td>
<td>Llantarnam Park, Cwmbran, Gwent, NP44 3XS</td>
<td>T: 01633 874024</td>
</tr>
<tr>
<td>IDL Fabrications Limited</td>
<td>Crabtree Lane, Clayton, Manchester, M11 4GJ</td>
<td>T: 0161 2306666</td>
</tr>
<tr>
<td>Interkey Services Ltd</td>
<td>2 Princewood Road, Corby, Northamptonshire, NN17 4AP</td>
<td>T: 01536 266607</td>
</tr>
<tr>
<td>Leigths Paints</td>
<td>Tower Works, Kestor Street, Bolton, Lancs. BL2 2AL</td>
<td>T: 0161 2306666</td>
</tr>
<tr>
<td>Livis Ltd</td>
<td>Livis House, 50 Victoria Park Dartford, Kent, DA1 5AJ</td>
<td>T: 01322 220058</td>
</tr>
<tr>
<td>Malakoff Limited</td>
<td>North Ness, Lerwick, Shetland, ZE1 OLZ, UK</td>
<td>T: 01595 695544</td>
</tr>
<tr>
<td>Matthew James Services</td>
<td>Unit 4, Shidon Business, Cowen Road Blaydon, Newcastle-Upon-Tyne, NE21 5TX</td>
<td>T: 0191 414 5700</td>
</tr>
<tr>
<td>Moore Steel Developments Ltd</td>
<td>Station Road, Thorne, Peterborough PE6 OQE</td>
<td>T: 01733 270729</td>
</tr>
<tr>
<td>Paint Inspection Ltd</td>
<td>Trafalgar House, 223 Southampton Road, Portchester, PO6 4PY</td>
<td>T: 0845 4638680</td>
</tr>
<tr>
<td>Possilpark Shotblasting Co Ltd</td>
<td>Dalmanock Works, F3 Dunn Street, Glasgow, G40 3PE</td>
<td>T: 0141 556 6221</td>
</tr>
<tr>
<td>Radleigh Metal Coatings Ltd</td>
<td>Unit 30 Central Trading Estate, Cable Street, Wolverhampton, WV2 2HX</td>
<td>T: 01902 870606</td>
</tr>
<tr>
<td>R.L.P. Painting</td>
<td>Heathfield House, Old Bawtry Road, Finningley, Doncaster, DN9 3DD, UK</td>
<td>T: 01302 772222</td>
</tr>
<tr>
<td>Taylor Engineering (UK) Ltd</td>
<td>Unit 7 &amp; B Curran Buildings, Curran Road, Cardiff CF10 5NE</td>
<td>T: 02920 371959</td>
</tr>
<tr>
<td>Tinsley Special Products</td>
<td>Enterprise House, Durham Lane, Eaglescliffe, Stockton-on-Tees TS16 0PS</td>
<td>T: 01642 784279</td>
</tr>
</tbody>
</table>
London Branch publish a monthly Newsletter. Details of all Branch activities, dates and venues can be found at www.icorr.org

**DIARY DATES 2012/2013**

**22nd - 26th October 2012**

**Basic Corrosion Course, Aberdeen**

The course provides a basic but thorough review of causes of corrosion and the methods by which it can be identified, monitored, and controlled. Active participation is encouraged through hands-on experiments and case studies, as well as an open discussion format.

All enquiries to Dr Paulette Sidky, CMC Ltd, p sidky@cmc.ltd.uk. Tel. 020-7460 9408

**24th October – 3rd November 2012**

**Cathodic Protection CP3**

The CP3 Cathodic Protection Technologist Course is an intensive 6-day course that presents CP technology to prepare students for the NACE Cathodic Protection Technologist Certification Examination.

All enquiries to Dr Paulette Sidky, CMC Ltd, p sidky@cmc.ltd.uk. Tel. 020-7460 9408

**TBC – November 2012**

**Corrosion of Infrastructure ‘Present Knowledge and Future Solutions’**

Venue: Institute of Materials, Minerals and Mining 1 Carlton House Terrace, London SW1Y 5DB.

Further information along with a registration form is available to download at www.icorr.org in the conferences and events section. You can also contact Prof. Robert Akid, robert.akid@manchester.ac.uk or Prof. Paul Lambert, paul.lambert@mottram.ac.uk.

**5th - 9th November 2012**

**Designing for Corrosion Control, London**

Parallel Path to certification for senior corrosion Technologist – The Designing for Corrosion Control course reviews the principles of corrosion and corrosion control and provides a systematic method for applying the technology of corrosion prevention to the design process. All enquiries to Dr Paulette Sidky, p sidky@cmc.ltd.uk. Tel. 020-7460 9408

**5th - 9th November 2012**

**Corrosion Control in the Refining Industry Course**

Four and a half day Classroom Course including quizzes and discussion. The purpose of Corrosion Control in the Refining Industry is to provide you with an overview of refinery process units, specific process descriptions, and the opportunity to identify and examine corrosion and metallurgical problems that may occur in process units. You will also examine techniques and practices that may be used to control corrosion in refineries. No examination.

All enquiries to Dr Paulette Sidky, CMC Ltd, p sidky@cmc.ltd.uk. Tel. 020-7460 9408

**8th November 2012**

**London Branch Joint meeting with W&JS**


**22nd November 2012**

**Midland Branch ½ Day Meeting**

Birmingham Council Chambers, Birmingham, B1 1BB.

The Future of Galvanic Anodes 12:30 – 17:00 (followed by the iCorr AGM).

**26th-28th November 2012**

**Corrosion Control in the Oil & Gas Industry**

Venue: Amsterdam

For further details please contact Colin Britton on Tel. 01480 860943 or email cbrit79727@aol.com

**13th December 2012**

**London Branch Annual Christmas Luncheon**

Venue: Royal Overseas League, Park Place, St James’s Street, London SW1A.

Contact: Mike Allen, mike.aller9@btinternet.com

**10th January 2013**

**London Branch Meeting**

A panel discussion and debate on CUI and the need for coatings at temperatures above 12°C. 17.30 for 18.15 start. Venue: The Naval Club, 38 Hill Street, Mayfair, London, W1.

**7th February 2013**

**Midland Branch Evening Meeting**

Nottingham University Presentation (tbc) and branch AGM. 18:00 for 18:30 start.

**14th February 2013**

**London Branch Meeting**


**13-14th June 2013**

**London Branch Offshore Cathodic Protection Conference**

At the Royal Overseas League in London there will be a two day Offshore Cathodic Protection conference, at this conference industry leaders will present papers on leading edge issues in this important area of corrosion control technology; this will be a must attended event. Please register your interest and to receive the early conference program at: admin@icorr.org

---

**EVENTS**

**September/October 2012 No. 109**

**London Branch Meeting**

‘Glassflake for material performance improvements’. 17.30 for 18.15 start.

Venue: The Naval Club, 38 Hill Street, Mayfair, London W1.

**13th December 2012**

**London Branch Annual Christmas Luncheon**

Venue: Royal Overseas League, Park Place, St James’s Street, London SW1A.

Contact: Mike Allen, mike.aller9@btinternet.com

**10th January 2013**

**London Branch Meeting**

A panel discussion and debate on CUI and the need for coatings at temperatures above 12°C. 17.30 for 18.15 start. Venue: The Naval Club, 38 Hill Street, Mayfair, London W1.

**7th February 2013**

**Midland Branch Evening Meeting**

Nottingham University Presentation (tbc) and branch AGM. 18:00 for 18:30 start.

**14th February 2013**

**London Branch Meeting**


**13-14th June 2013**

**London Branch Offshore Cathodic Protection Conference**

At the Royal Overseas League in London there will be a two day Offshore Cathodic Protection conference, at this conference industry leaders will present papers on leading edge issues in this important area of corrosion control technology; this will be a must attended event. Please register your interest and to receive the early conference program at: admin@icorr.org

---

**BRANCH CONTACT DIRECTORY**

**ABERDEEN:**

Frances Blackburn (Secretary)
Tel: 01224 243360
Email: ICorrABZ@gmail.com

**DUBLIN:**

Martha Hidalgo (Secretary)
Tel: +353 1 4027945

**Terry Hinds (Chairman)**
Tel: 0145 066 71 Fax: 0145 662 13
Email: info@galcosteel.ie

**NORTH EAST:**

Brendan Fitzsimons
Tel: 0191 493 2600

**NORTH WEST:**

Brenda Peters, Analysis Scientific
Tel: 01706 871700
Email: brenda.peters@analysis-scientific.co.uk

**LONDON:**

Andy Taylor (Chairman)
Tel: 0771 7205406 (UK)
Tel: +994773251548 (Azerbaijan)
Email: aetaylor12@yahoo.com

**Geoff White (Secretary)**
Tel: 01728 602289
Email: geoff.white237@btinternet.com

**CSD Division: Nick Stevens**
Tel: 0161 3063621
Email: nick@specialisedcoatings.co.uk

**CSD Division: Nick Stevens**
Tel: 0161 3063621
Email: nick@specialisedcoatings.co.uk

**YORKSHIRE:**

Nigel Peterson-White
Tel: 01422 356752
Email: nigel@specialisedcoatings.co.uk

Young ICorr Chairman: Oliver Lewis
Email: oliver.lewis@shu.ac.uk

**CED Division:**

Nick Smart
Tel: 01635 280385

**Young ICorr Chairman:**

Oliver Lewis
Email: oliver.lewis@shu.ac.uk

**CSD Division:**

Nick Stevens
Tel: 0161 3063621
Email: nick@specialisedcoatings.co.uk