Winn & Coales celebrates a remarkable year P16
Approved Courses

- Painting Inspector Levels 1, 2 & 3
- Pipeline Coatings Inspector Level 2
- Cathodic protection of re-inforced concrete structures Levels 1 & 2
- Insulation Inspector Level 2
- Hot Dip Galvanising Inspector
- Fire Proofing Inspector Level 2
- Cathodic protection of buried and submerged structures Levels 1 & 2

For further information or administrative details, costs and bookings for courses and examinations or detailed information packages free of charge, please contact:

Martin Dawson or David Betts on:
Tel: +44 (0)1709 560459 Fax: +44 (0)1709 557705
Email: enquiries@ruanetpo.com
Internet: http://www.ruanetpo.com

Technical and eligibility enquiries can be made direct to Dave Griffiths the ICorr Scheme Manager on:
Tel: +44 (0)1709 550999

Ruane & T P O’Neill Argyll-Ruane Ltd.
Meadowbank Road, Rotherham S61 2NE, United Kingdom

Reader Enquiry Service

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: __________________________
________________________ Postcode: __________________________
Tel: __________________________ Fax: __________________________
Email: __________________________
**CONTENTS**

**Institute News**
- The President Writes 4
- We are moving 4
- ICorr Annual General Meeting 5
- Obituary – Bob French 5
- Report on EuroCorr 2010 6-7
- Technical Topics 7
- Advances in corrosion protection by Organic Coatings 8
- Surface World Show 2011 9
- London Branch News 10
- ICorr Works visits Galvanizing Ltd 10
- New Sustaining Member: Torishima Service Solutions 11
- Letter to the Editor 11
- First ICorr CP Training Course in Korea 11

**Technical Article**
- Tubercles and localized corrosion on carbon steel 12-15

**Company News**
- Winn & Coales 16
- Specialised Coatings 17
- Members Upgrades 17
- Belzona 18
- Winn & Coales (Denso) Ltd 19
- Pyeroy 20
- Argyll-Ruane 20

**Sustaining Members** 21-28

**ICATS Registered Companies** 29-31

**Diary and Branch Contacts** 32
The President Writes

At the end of the Institute AGM after I had been elected and (then) Past President Paul Lambert had invested me with that beautiful chain of office he dropped the bombshell that the deadline for “The President Writes” in the next issue of Corrosion Management was the next day! So here goes.

Over the past year since I became re-involved with ICorr there have been several distinct reactions from members. “Bob Crundwell we thought that he had rusted away years ago”, “Bob Crundwell, I am sure that I have heard that name somewhere but can’t remember where” or “Bob Crundwell who the hell is he?” Time for me to (re-)introduce myself.

I studied Engineering Metallurgy at Sir John Cass College at the time that Lionel Shrier was head of department and stayed on to do a PhD in Corrosion working under Michael (Vulture) Clarke.

I joined ICorr in the early 1970’s when I was Chief Engineer of The Catholic Protection Co. Ltd., and NACE when I was Engineering Sales Manager of Morgan Berkeley & Co Ltd. In both cases encouraged by my respective employers. This really came together when at the end of the 1970’s, I moved to Impalloy and became involved with the Midland Branch of ICorr, particularly the two highly successful Catholic Protection Conferences, eventually becoming Chairman. I also contributed to the establishment of the CCEJV between ICorr and NACE becoming Technical Activities Chairman in the mid 1980’s. I was also a member of ICorr Council at that time when ICorr was based at IMF in Birmingham. My involvement with ICorr took a sharp break when I moved to Saudi Arabia to manage the Impalloy Joint Venture. On my return the Midland Branch was pretty well moribund, ICorr had moved south and I had my work cut out running Impalloy and subsequently the group of businesses which eventually became Trident Alloys when I lead a Management Buy-Out. I continued as a Fellow of ICorr, supported the organisation at conferences and in European Standards Committees but my involvement never grew back to its previous levels.

At the end of 1998 I decided that it was time to do something different and left the metallurgical and corrosion world. For a while I did all sorts of things; helped set up a virtual technology centre, ran the local Chamber of Commerce through a reorganisation, helped my son to renovate a Victorian house and then joined a government funded community regeneration project in Walsall as Economic Development Manager. My primary objective was getting unemployed people into work, often training was required and not a little liaison between local government and local employers. As a result I have developed a serious interest in “lifelong learning”. For most of the readers of this article this translates to Continuing Professional Development but for many who have not had the benefit of formal post school education or training this can be a frightening prospect getting back into an unfamiliar (or worse) environment which may have been a serious stumbling block in earlier life.

So what can I bring to ICorr during my Presidency? I am out of date on the latest corrosion technology but up to date on corporate governance particularly registered charities. I am passionate about education and training, which is a big opportunity for the Institute and I am keen to enhance the support that the Institute gives to its members to facilitate them in doing what they are so good at.

I am looking forward to working with you all over the next two years and to contributing to ICorr to the best of my ability.

WE ARE MOVING

Early in the New Year during the first week of January, ICorr and Correx Ltd will be moving from Leighton Buzzard to Northampton. We will close for business on the 23rd December 2010 and re-open in our new office on 10th January 2011. Our new abode will be in the Newton Building on the Avenue Campus of the University of Northampton.

The Newton Building (named after a village in Northamptonshire) started life in 1913 as Northampton School for Girls which closed after a merger. Purchased by the University in 2007 it has undergone a £11 million redevelopment into an innovative and progressive centre mainly for teaching and research however a small number of tenants are taking space in the building.

We shall have an office for the administrative staff, a meeting room which can be available to members for small meetings or as a place to work for a short while and a store for records.

In addition the building provides a plethora of other meeting facilities from a simple small room up to the former school hall mostly with up to date audio visual facilities and there are informal breakout spaces and a coffee shop which can also cater for meeting refreshments. The building, which houses the University’s School of Science & Technology, has state of the art ICT which we can link into, a fully staffed reception and plenty of parking. Fronting onto St Georges Avenue, across the road is a very large open space formally home to a racecourse, a cricket ground and the Balloon Festival.

Our new address will be:
The Institute of Corrosion or Correx Ltd
The Newton Building
St George’s Avenue
Northampton
NN2 6JD
Tel: 01604 893883
Fax: 01604 893878
e-mail remains the same: admin@icorr.org
ICORR ANNUAL GENERAL MEETING 11TH NOVEMBER 2010

The AGM was held at the Naval Club in Hill St, London before a London Branch regular meeting. Attended by more than 25 members with apologies recorded for a further 22 the meeting covered the agenda in three quarters of an hour. The minutes of the previous AGM had been available to members on the ICorr website for several weeks and were dealt with rapidly following which Prof Paul Lambert gave a review of his period as President the highlights of which were the celebration of the 50th Anniversary of ICorr and the MoU with BINDT. The accounts similarly had been posted on the ICorr website but were explained in some depth by the treasurer Dr A J Collins who highlighted a surplus for the year of £44k and one carried forward of £256k representing a healthy state of affairs for the Institute. When it came to elections there had been only one candidate proposed for each of the elected offices namely as President Bob Crundwell, as Vice President Trevor Osborne, as Treasurer Tony Collins, and as Hon Secretary Jane Lomas. Brian Wyatt proposed and Eric Martin seconded that they should all be elected and this found unanimous favour with the members. Paul Lambert invested Bob Crundwell with the Jewel of Office as President. Trevor Osborne being absent on business would be invested as Vice President at the next suitable occasion probably the London Branch Xmas Lunch.

ICorr AnnuAl GenerAl MeetInG 11th noveMber 2010

It is with great regret that we have learned of the recent death of Bob French who passed away on Thursday 11th Nov 2010. Bob became ill at the end of 2006 when he was diagnosed with an inoperable brain tumour. For the last 2 years he has been looked after by Jean his wife and the staff of the Sidcup Care and Nursing Home.

As many of you will know, Bob has been a long serving member of the ICorr and a stalwart of the London Branch after it’s revival in the early 1980’s. He was a member of the committee responsible for recruiting new members and worked closely with the first Membership Services Officer, Fred Palmer. The success of many of the early London Branch meetings at the Imperial Hotel, were down to Bob whipping people into the meetings.

Bob started his career in the paint industry with Crown Paints in the early 60’s after which time he moved to Blackburn, Lancs. and eventually to Das Island as a coatings inspector before returning to London in the mid 70’s where he started working for Hempel Paints.

He became a certified ICorr/NACE level 3 coating inspector, when ICorr and NACE had developed a joint qualification and training scheme, before returning to Saudi Arabia in 1986 for another 2 year contract. At the completion of the overseas contract he started work for Sigma Coatings in London, then in early 1990 he went to work for Kemira Coatings.

He was the first ICATS appointed coordinator, when the scheme was first launched by Correx, in 2004, a role which he undertook with tremendous enthusiasm and set the scene for this successful, national qualification for the UK’s painting industry. When the role with ICATS became too onerous, he then joined North Kent College in Tonbridge as a Lecturer on student applicator coating training.

Bob was always very keen on the social aspects of the paint industry, where entertaining was usually of the liquid kind, as I am sure many will remember the various whisky and wine tasting events, which were always well patronised and very enjoyable.

Bob leaves behind a widow, Jean, who is well known to many ICorr members and people in the paint industry, since she provided Bob with so much support during his career at both social and works events and was with him to the end. We all send Jean our deepest sympathy and our best wishes.
REPORT ON EUROCORR 2010
HELD IN MOSCOW 13TH-17TH SEPTEMBER

by Technical Secretary, Douglas J Mills

This year’s Eurocorr was held at the Congress Centre of World Trade Center (WTC) in central Moscow. The title was “From the Earth’s Depths to Space Heights” and it ran from 13th (a Tuesday!) to 17th September (Friday). In terms of talks that lived up to the title, certainly there were plenty about getting oil and gas out of the depths of the earth. But space ones were a bit harder to find although I did attend an interesting presentation (Exposure of silver to atomic oxygen) about a metal corroding in the stratosphere given by A De Rooij from the European Space Agency Noordwick, NL. The number of delegates topped the 600 mark which considering the rather far away (and expensive) location was a good number. Moscow is a challenging place to get around particularly if you have not mastered the Cyrillic alphabet (as your correspondent hadn’t). The Metro is the key though - I was lucky enough to sort that out on the first evening which gave me a way of getting around inexpensively (my hotel was an hour from the conference centre!). There were 22 sessions, 19 run by working parties and 3 work shops with over 300 oral presentations and over 200 posters. Up to 10 sessions took place simultaneously. And there were even additional sessions at other venues like the Workshop on Standards and Regulations in Corrosion Protection of oil and gas production equipment and pipelines held at GAZPROM Vinigaz. There was a good sized exhibition area, and near to this the posters were displayed and coffee and lunches were served. The latter were a bit basic, essentially a packed lunch. The usual EFC working party meetings took place. Your correspondent attended the General Assembly (GA) on behalf of ICorr. The President is still Philippe Marcus. The resignation of our own Paul McIntyre as Scientific Secretary due to ill health was accepted with regret. Much appreciation was expressed to Paul for the sterling work he had done in that role over the last thirteen years. Apart from the GA your correspondent also attended, as the UK delegate, the EFC Coatings Working party (14) meeting. In the absence of Joerg Vogelsang (the chair of WG29), he gave a report on the activities of a standard’s group ISO TC35 SC9 WG 29 which is working to “standardize” electrochemical techniques for assessment of organic coatings. Social events included a welcome reception on the Monday evening, a whistle stop night time bus tour to the sights of Moscow (Red Square, Victory Park etc) and the conference dinner Unfortunately the cost (some £80!) and other commitments prevented your correspondent from attending this. However a friend (Kristof Wolski) told me it was enjoyable and exceeded his expectations! A couple of pictures taken by Wolski are in this set. The technical part of the conference opened on the Tuesday with a welcome address from A Muradov. This was followed by the presentation of the Cavallaro medal to Michael Schutze who gave a good talk summarising his activities in the field of high temperature corrosion. This was followed by a plenary talk (in Russian) by a gentleman from Oao Gazprom who gave a good talk summarising his activities in the field of high temperature corrosion. This was followed by a plenary talk (in Russian) by a gentleman from Oao Gazprom (the slides were in English and there was simultaneous translation although those who used it claimed it was not working all that well!) This was followed by an Invited plenary lecture
by Y Yuznetsov (in English) entitled Progress in Corrosion Inhibition and Modification of Protective Nanolayers on Metals. There were also plenaries at the start of the other three days. On Wednesday Y Zuo from Beijing University of Chemical Technology, gave a Study of Current Fluctuations during the Early Stages of Pitting Corrosion; on Thursday came the Effects of Air Pollution and Climate on Materials including Cultural Heritage by A Tidblat from Swerea KimabAB, Sweden and on Friday, Composite Polymer Protective Coatings for Use in Aggressive Media by V A Golovin from the AM Frumkin Institute, Moscow (the latter talk was of particular interest to this correspondent as it highlighted the inherent inhomogeneous nature of polymers and, in a nutshell, theoretically justified the use of multi-coats). The special workshops included Corrosion in Natural Environments, Corrosion and Corrosion Protection in the Aerospace Industry and Nanotechnologies and a joint workshops EFC-CEOCOR Materials and Diseinfection run by WP 19 (polymer materials) WP20 (drinking water systems) and CeoCor Section B. The papers from all these sessions will appear on the ROM available from Dechema. So overall this was, as Edinburgh had been two years ago and as Nice was last year, a very good conference. The Eurocorr conference next year is in Stockholm (4-8 Sept 2011). Hope to see as many as possible of you there!

Technical Topics No 28: DEALING WITH TECHNICAL ENQUIRIES
by Technical Secretary, Douglas J Mills

I’ve not received much correspondence relating to recent TT’s. So I am going to make this one a bit shorter without any scary pictures of corrosion! Actually I have got two other contributions in this edition of CM: both conference reports. So I was thinking maybe a TT as well might be over-egging it! But I could not resist writing something so that when the 100th edition of Corrosion Management comes out in March/April 2011, it will correspond with the 30th edition of Technical Topics! In the 30th TT I intend to provide an index to the preceding twenty nine and do a general review of my column over the last five years. Anyway back to this one, I thought I’d say something about how I deal with technical enquiries. Most of these come from companies (sometimes from individuals) and most are NOT members of the institute (as an interesting aside almost 100% of enquirers are male!). They tend to arrive as e-mails to me from Head Office, many originally posted on the website although some are addressed specifically. When an enquiry comes in an area that I feel I know something about (I guess about 70%), I am prepared to give an “off the top of my head” opinion. What I don’t have time to do is search the web or search through books to give an answer. However even when I try to answer it myself, I like to give enquirers other sources of information. The most popular is the Institute’s own website - I direct people to the group of sustaining member companies: or I may refer them to books that I am familiar with: and occasionally to individuals. Most of my replies are by e-mail and I copy these to Head Office who record them on a spreadsheet with topic, date, company, and I then went on to suggest that if possible the actual components should be tested in the likely worst case environment and that electrochemical techniques (potential measurement, LPR, EIS, Noise) could be used to tell the likelihood of a major problem relatively quickly without having to run the test for months or even years. Another group of enquiries are failures (why did it go wrong?). These tend to be easier to deal with although sometimes I get “stumped”. If I cannot answer it then I may try to refer the enquiry to somebody that I know has done work in that particular area. If I cannot think of anybody, or if it is fairly general enquiry, then I will refer the person to the list of companies on our web site and let him/her make the choice as to whom to approach. If anyone wants to comment on this approach, feel free to contact me at the usual address: Douglas@harrbridge.freeserve.co.uk

Corrosion Engineering Division (CED) Working Day/Seminar - Novel Corrosion Prevention Technologies

The next Corrosion Engineering Division (CED) Working Day/Seminar will be held on 19th May 2011 at NPL Teddington. We are looking for offers of lectures within that field, please contact Nick Smart nick.smart@serco.com or Douglas Mills douglas@harrbridge.freeserve.co.uk.

Full details for this event will be in the next issue of Corrosion Management magazine.
Although it is now some time since this important, mainly academic but with some good practical papers as well, coatings conference took place, it was felt that CM readers might be interested in reading a report about it. Further details (and also information about the preceding conferences) are available from the Technical Secretary.

This conference was the 5th quinquennial conference (the series commenced in 1989) that has been run by David Scantlebury at Christ’s College on Advances in Corrosion Protection by Organic Coatings. Martin Kendig helped secure publication of the conference proceedings as a special proceedings volumes of the Electrochemical Society (see below). There were around 45 delegates. Many of those who came gave papers. A notable feature about this particular conference was that it was held in the year of the 100th anniversary of the birth of Dr J E O (Jack) Mayne. Jack attended the first two conferences (and presented papers at them although he was in his 80s on both occasions) and was the doyen of this field, with the work in his laboratory in Cambridge, particularly during the period from around 1955 to 1980, putting the whole subject on a sound scientific footing. Anyway at this conference around thirty papers were delivered. The style of these conferences is nice and relaxed so there is plenty of time for discussion. The conference started as usual with a welcome reception in Christ’s. Social activities included a buffet in the Hall accompanied by wonderful a capello music by the St Johns Singers and punting activities on the river Cam. Also there was a very good banquet on the Thursday evening which Jack and Margaret Mayne’s son Philip and daughter Anne in attendance. Onto the papers. A very brief synopsis of the topic areas with the names and authors of the main papers within each area is given below:

Anti-corrosive pigments (Novel anti-corrosion calcium magnesium phosphate pigment from David Scantlebury, Evaluation of corrosion-inhibiting pigments by Martin Kendig, Mg-rich primers for aluminum from Gordon Bierwagen); Adhesion (Aminobutylphosphonic acid as adhesion promoter for epoxy on carbon steel from Stuart Lyon and Do conversion layers improved adhesion? by David Scantlebury); Accelerated testing/electrochemical evaluation (Prediction of long-term coating performance from short-term electrochemical data by Ray Taylor, Developments in novel methods of making electrochemical measurements on coated substrates from Douglas Mills and Electrochemical processes beneath paint using a potentiostatic pulse method by John Sykes. Also within this topic area was Predicting coating failure using the central limit theorem and physical modelling by Stuart Kroll). Other topics were: Pretreatments (Tailored sol-gel coatings as environmentally friendly pretreatments for corrosion protection by Violeta Barranco and Corrosion protection by conducting polymers; how to get it working from Michael Rohwerder); Effect of strain (Mg-rich primer performance under mechanical strain by Kerry Allahar); Filiform corrosion (Ion exchange pigments and filiform corrosion from Geraint Williams) and incompatibility issues (Why the painting of aluminium metal spray coatings with epoxy doesn’t work from Stuart Lyon). Overall this was a very successful conference - let us look forward to the next one in 2014!

* Publication details of submitted papers: Fifth International Symposium on Advances in Corrosion Protection by Organic Coatings. ECS Transactions, Volume: 24 No 1 published by The Electrochemical Society 2010
Surface World 2011 will run alongside Correx - the national corrosion conference and exhibition.

Correx 2011 will be a major event in the UK corrosion industry - aimed at everyone interested in coatings and cathodic protection: engineers, specifiers and practitioners.

Conferences, workshops, courses and seminars will run in tandem with the exhibitions.

It’s the finish that helps sell your product - come and see the UK’s only international showcase for the product finishing, surface engineering and for the first time the corrosion control markets. All the leading surface finishing suppliers all under one roof over 3 days.

All this will ensure that Surface World 2011 with Correx 2011 will be the biggest event in the surface treatment, coatings and finishing industry for many years.

For more information contact Nigel Bean on:
Tel: +44 (0)1442 826826
E-mail: nigelbean1@aol.com
or visit the website at:
www.surfaceworldshow.com

FREE ENTRY
www.surfaceworldshow.com
ICORR WORKS VISIT TO EAST ANGLIAN GALVANIZING LTD

A few members of ICORR enjoyed a visit to East Anglian Galvanizing Ltd on Wednesday, 29 September 2010. The morning started with presentation by Steve Milnes, Eastern Regional Director, followed by Questions & Answers. After a Safety brief/issue of PPE, there followed a tour of the plant, followed by another opportunity for Q&A’s and lunch. With more than 150 years of history, Wedge Group Galvanizing is one of UK’s largest hot-dip galvanizing organizations.

The process involves the work being given an initial hot caustic dip at 45-50°C, followed by a rinse. Then the work is pickled in 12 - 14% hydrochloric acid. After another rinse, it is placed in a flux tank at 65 - 75°C, containing a proprietary mixture of ammonium chloride, zinc chloride and potassium chloride. After passing through a hot-air dryer, the work is then immersed in the molten zinc at 450°C for several minutes. Intermetallic compounds are formed at the metal-coating interface with the object so that an alloyed layer is produced in this region. Finally, the work is quenched in a chromate passivating tank to ensure a bright finish. The shortest bath size is 4.5 m; the longest being 22 m (with a double dip capability of 29 m), the maximum vertical dip being 3.2 m and a maximum lifting capacity of 16 tonnes. All processes carried out at the plant are conform to all environmental regulations with respect to land, air and water, e.g. hot air re-circulation from the zinc kettle and collection of rainwater and re-circulation of rinse/pickle and quenching waters - in fact a good role model for any modern industrial plant.

The benefits of galvanizing include: speed of application compared to paint, long life expectancy (typically 20 years industrial/marine and up to 50+ years in rural environments), all-over coverage and low lifetime cost.

The company has a wide spread of markets, with some 2500 customers. With 800 employees based at 14 sites, the company remains family-owned. The Company is a Sustaining Member of ICORR, EGCA and BCSA. It has recently become global - with plants in the USA, Germany, Italy and a joint venture in India.

The members attending thanked their hosts for an enjoyable and instructive visit.

Additional information: Wedge Group Galvanizing Ltd, Stafford Street, Willenhall, West Midlands, WV13 1RZ. Tel: 0845 271 6090. www.wedgegalv.co.uk
NEW SUSTAINING MEMBERS PROFILE

TORISHIMA SERVICE SOLUTIONS

Torishima Service Solution’s Surface Technology division has been developed to provide the market with innovative, cost-effective engineering remediation solutions to corrosion-related problems and reduced efficiency within our customer’s plant and equipment.

Our Surface Technology division has a range of specialist products that have been designed specifically to meet the demands of very arduous environments and conditions.

Our customers have the option to purchase a coating system designed specifically to meet their needs or alternatively have it applied by our skilled site preparation and coatings team. From our large product portfolio comprising of polyester, vinyl ester, and other high quality resins a range of systems can be designed for use in high temperature and highly corrosive environments. The extent of this range also includes our innovative range of solvent-free epoxy systems compliant with current environmental legislation. The systems have been designed to provide moisture-tolerant benefits ideally suited to all coating substrates.

Whatever the corrosion or containment problems encountered, our customer’s can be assured that Torishima can provide a solution to their specific problems.

Torishima’s range of products have been subjected to a programme of stringent industry tests by independent NAMAS approved laboratories to provide assurance to our customer’s of the quality and performance characteristics of our coatings products. This can be useful when the product has not been applied in a particular environment or application.

The products and services from Torishima Services Surface Technology offer complete confidence and reliability within the world’s most demanding industries such as Oil & Gas, Petrochemical, Marine and Power Generation markets.

For further information from:
TORISHIMA EUROPE LIMITED
Sunnychide Works, Gartsherrrie Rd Coatbridge, Scotland ML5 2DL
Tel: 44-1236 443951 Fax: 44-1236 702875 www.torishima.eu

LETTER TO THE EDITOR

Dear Dr. Akid,

I read the article in ‘Corrosion Management’ The Institute of Corrosion and the British Institute of NDT take their relationship to the next stage by signing am MoU.’, (September/October 2010, p.4, No 97) and wish to congratulate all concerned with this initiative and negotiations.

It brings to mind my change in activity in 1967 when, as a member of the Corrosion Section at AERE, Harwell, I was asked to join the NDT Centre at Harwell (headed by the late Roy Sharpe) which had been set up following the initiative to assist industry and, more importantly, try to earn some money outside the nuclear budget. As a chemist, I thought to myself, ‘What can I do with all those physicists?’ As it happened, it turned out very well as I decided to take an interest in all the ways that corrosion could be both monitored and inspected. This led to a trial programme of electrochemical methods for corrosion monitoring in multishell desalination plants.

The synergism of NDT and ‘corrosion monitoring’ has now taken place over the last decades as exemplified by the joint developments of multiprobe online ultrasonics, field signature systems and intelligent vehicles for inline pipeline inspection.

May I wish all concerned with the discussions every success in their future discussions.

Yours sincerely,

Colin Britton
C.F.BRITTON, FICorr, MRSC

FIRST ICORR CP TRAINING COURSE IN KOREA

Recently, the first ICorr Cathodic protection training and certification course was presented at Busan, Korea.

This was the first event in a collaborative initiative between Pusan National University (PNU), The Corrosion Science Society of Korea (CSSK) and the Institute of Corrosion, UK.

The course was arranged by the Institute’s world-wide scheme provider, Argyll-Ruane, and was conducted by Rob Kean, Senior CP tutor.

The course, which was the BS EN 15257 Cathodic Protection of Buried and Submerged Structures Level 1, was presented over five days.

The event marked the first time that training and certification to the recently introduced international CP Standard was available in Korea.

Several local organisations took advantage of the opportunity of having staff trained to the increasingly recognised standard and the event was deemed to have been entirely successful.

Dr. Jong-Jip Kim, the Vice President of CSSK said “it is very good for Korean industry that CorRel Technology and Korea Gas Corporation (KOGAS) have developed this opportunity for us to take advantage of the advanced training opportunities available through the Institute of Corrosion”.

More from Dave Griffiths, ICorr Scheme Manager dave.griffiths@argyllruane.com.
Corrosion Management | November/December 2010

**TUBERCLES AND LOCALIZED CORROSION ON CARBON STEEL**

B.J. Little, R.J. Ray and J.S. Lee Naval Research Laboratory, Stennis Space Center, MS 39529–5004, USA, blittle@nrlssc.navy.mil, Fax: 228-688-4149. T.L. Gerke Department of Geology, University of Cincinnati, Cincinnati, OH, USA, 45221.

**Summary**

The chemistry, mineralogy and microbiology of tubercles on cast iron and carbon steel were investigated. Tubercles, from diverse fresh water environments and of varying ages, consistently had an outer crust of goethite and lepidocrocite and an inner shell of magnetite. Core regions differed in structure, composition and chemistry. The presence of tubercles on carbon steel and cast iron cannot be used to conclude localized corrosion directly under the tubercles or a role for bacteria in their formation.

**Introduction**

It is well established that tubercles formed on austenitic 300 series (304 or 316) stainless steel in untreated well water (200-300 ppm Cl-) and chlorinated drinking water produce O₂ concentration cells and under-deposit corrosion. In an oxygenated environment, the area under the tubercle, deprived of O₂, becomes a relatively small anode compared to the large surrounding oxygenated cathode ([1-4]). Metal is oxidized at the anode creating a pit and pH decreases. The pH in the pit depends on the alloying elements. Cl⁻ migrates from the electrolyte to the anode to neutralize charge, forming heavy metal chlorides that are extremely corrosive. Pitting involves the conventional features of differential aeration, a large cathode: anode surface area and the accumulation of bound oxidized iron. Under these circumstances, the deposit or tubercle initiates the pitting and propagation is a function of alloy and environment (e.g., Cl⁻). Tubercle formation on stainless steels is frequently attributed to iron-oxidizing bacteria (IOB), e.g., Gallionella and Leptothrix, and the accumulation of bound oxidized iron. In summary, tubercles cause corrosion. In contrast, tubercle formation on cast iron and carbon steel can be the result of corrosion, i.e., corrosion causes tubercles [5]. Throughout this paper the term “cast iron” specifically refers to unlined cast iron. Several authors have indicated a role for microorganisms in tubercle formation on cast iron and carbon steels, especially IOB [6]. However, the relationships between tubercle formation, microorganisms and corrosion of cast iron and carbon steel in fresh water have not been established. In the following sections we present morphology, mineralogical, chemical and microbiological data for tubercles from three sources – Duluth-Superior Harbor (DSH), a fresh water estuary; a drinking water distribution system (DWDS) in the midwestern portion of the United States and a high-pressure industrial water system (HPIW) from a U.S. government facility located near the Gulf of Mexico.

**Methods and Materials**

Details related to collection, embedding and imaging iron corrosion products have been reported elsewhere [7]. Operating conditions for the environmental scanning electron microscope (ESEM) and energy-dispersive spectroscopy (EDS) were described in the same publication [7]. The mineralogy of the tubercles was analyzed using a Siemens D-500 automated diffractometer system using a Cu Kα radiation at 30 mA and 40 kV. The 2θ ranged from 5° to 60°, with a 0.02° step, and a second count time at each step. Crystalline phase identifications were made on the basis of peak position and peak intensities using the American Mineralogist Crystal Structure Database, the Mineral Database, and the International Center for Diffraction Data (http://rruff.geo.arizona.edu/AMS/amcsd.php, http://webmineral.com/). Approximately ten tubercles from each location were examined.

**Results**

Tubercles from untreated fresh water in DSH

The water chemistry in DSH is as follows (concentrations in mg L⁻¹): pH, 7.8–9.4; DO, 4.4–11.7 (near saturation); sulfate (SO₄²⁻), 4–30 and chloride (Cl⁻), 10. DSH is icebound from mid-December to mid-April and during that time has a durable, well-defined ice cover. Freeze ice thicknesses in DSH range from 0.5 to 1.4 meters in addition to snow ice, stack ice, and ice from wave and splash action along harbor walls. Ice scour breaks and removes the tops of tubercles each year and tubercles reform within a few months. DSH tubercles ranged in size from 2 x 3 cm after 1 year to 6 x 10 cm after 3 years. Tubercle height remained constant over the three-year period at about 2-5 mm. The general internal morphology of DSH tubercles consisted of a surface layer, overlying a hard shell layer that typically enclosed a core region (Figure 1). The surface layer of the DSH tubercles was made up of a reddish brown material composed of Fe(III) oxyhydroxides, primarily goethite with trace amounts of lepidocrocite. A black hard shell that had both metallic and non-metallic luster was under the surface layer and was composed predominantly of magnetite with trace amounts of goethite and lepidocrocite. The core region, yellowish-brown in color and composed of goethite and lepidocrocite,

![Figure 1. Diagram of DSH tubercle.](image-url)
All DSH tubercles were associated with localized corrosion, i.e., pitting (Figure 3). Pit volume, i.e., mass loss (depth x area) increased with time over a 3-year period. By year-3, the distribution of pit depths had increased (70-630 µm) with a metal loss of 215.25 mm³ over 625 mm². Increase in pit depth with time was not linear.

**Tubercles from chlorinated DWDS**

Tubercles removed from a 90 year-old cast iron pipe DWDS developed in water with the following composition (concentrations in mg L⁻¹): pH, 8.6, low to moderate hardness; alkalinity, 68; SO₄²⁻, 98; free chlorine, 0.97 and phosphate, 0.083. The bulk water is oxygenated to saturation levels. Tubercles from the DWDS ranged in size from a few to 10’s of cm in length and in some locations had coalesced and were up to 100 cm long. An average tubercle was approximately 10 cm long and 5 cm high. The DWDS tubercles were not associated with localized corrosion (Figure 4). The general internal morphology of all tubercles examined from this DWDS consisted of a core region overlain by a hard shell and surface layer. Magnetite, lepidocrocite and goethite were the predominant iron minerals identified for the tubercles, but in different proportions. Based on the different proportions of the iron phases in the core, tubercles were classified into three groups: Group 1a (goethite), Group 1b (lepidocrocite), and Group 2 (magnetite) [8]. The predominant group, Group 1a, had core material that was yellowish- to reddish-brown in color and composed of goethite and trace amounts of lepidocrocite. This region was overlain by a black hard shell layer that has a metallic luster and was composed of magnetite with minor amounts of goethite and the surface layer was reddish in colored material composed primarily of goethite with minor amounts of lepidocrocite and magnetite. Magnetite veins were also present within the core regions of all tubercles in Groups 1a and 1b producing a marbled appearance and some contain subregions of filamentous textures. IOB could not be located within the core regions of tubercles from the DWDS. Concentrations of phosphorus, calcium, lead, nickel, copper and zinc were detected by EDS throughout the core regions. Specific elements and concentrations of elements varied among tubercles from the same location and within a given region. In general the concentrations of calcium, copper, manganese, nickel, phosphorus, and zinc increased from the core to the surface layer. Aluminum concentrations were similar in the core and shell but increased in the surface layer. The highest concentrations of lead were localized in the surface layer and were lowest in the shell. Significant pitting was typically not associated with these tubercles (Figure 4).

**Tubercles from high-pressure industrial water (HPIW)**

The HPIW system is forty-three years old and the most recent water quality indicates the following (concentrations in mg L⁻¹): pH, 7.0, low to moderate hardness; SO₄²⁻, 12.2; chloride, 0.0. Tubercles were typically 5-10 cm long (developed along the axis of flow), 3-5 cm wide and 1-2 cm high. There were accumulations of lead within core regions. Tubercles from the HPIW had crusts of goethite and lepidocrocite and shells of magnetite. The core region contained biomineralized bacterial stalks (Figure 5). The tubercles were not associated with significant pitting.

One representative tubercle was examined in detail. Based on its internal morphology it is similar to Group 1a discussed above. It had yellowish-brown colored core material composed of goethite and moderate amounts of lepidocrocite and veinlets composed of hard black non-metallic magnetite (Figure 6). This region was overlain by a black hard shell layer that has a metallic luster and was composed of magnetite with minor amounts of goethite and lepidocrocite. A very thin (less than 0.5 mm) surface layer overlies all and was reddish in colored material. Because this layer was so thin the mineralogy and chemistry could not be examined. Concentrations of elements varied between the core and the hard shell layer of the representative tubercle. In general, concentrations of silica, aluminum and sodium increased from the core to the hard shell layer and there was a slight increase...
from the core to the hard shell layer in calcium magnesium, and lead concentrations. The core had higher concentrations of iron and slightly higher phosphorous concentrations.

**Discussion**

Angell [5] described abiotic and biotic mechanisms for tubercle formation on carbon steel and cast iron, i.e., mounds of corrosion products deposited above areas of "localized electrochemical corrosion” and deposition of insoluble iron by IOB. Menzies [9] described abiotic tubercle formation at breaks or discontinuities in an oxide scale exposed in an oxygenated environment.

"Anodic dissolution takes place and as metal ions concentrate in the solution the solubility product of the solid hydroxide is exceeded locally and hydroxide precipitates out as a hemispherical membrane which surrounds and covers the original discontinuity. This results in effective screening of the anodic area from available oxygen and the metal at the discontinuity remains anodic."

Herro [10] working with tubercles in cooling waters concluded that differential aeration cells caused tuberculation, suggesting that oxygen deficient regions below the accumulated corrosion products were anodic sites, while surrounding areas were cathodic. He indicated that tubercles grew as a result of both internal (anodic) and external (cathodic) reactions, i.e., anodic dissolution of metal resulted in the accumulation of Fe(II) (ferrous) and Fe(III) (ferric) ions and cathodic reactions outside the tubercle increased the pH and caused the precipitation of carbonate and other species whose solubility decreases with increasing pH.

Several investigators have demonstrated bacteria within tubercles [7, 11, 12]. Tuovinen and Hsu [13] suggested that there were zones within some tubercles that contained enough organic carbon and other nutrients to support the growth of microorganisms and microcosms with symbiotic relationships and nutrient cycling. Miller and Tiller [14] indicated, "iron bacteria, which, together with the ferric hydroxide they produce can form extensive deposits called tubercles on the inside of water pipes." Tiller [12] suggested that iron-oxidizing bacteria "encouraged" the formation of tubercles.

Several authors have described the internal morphologies of tubercles [8, 10, 15]. Herro [10] indicated that tubercles should contain the following structural features: outer crust (hematite, carbonate, silicates), inner shell (magnetite), core material (ferrous hydroxide, siderite, phosphates), fluid cavity and corroding floor. Sarin et al. [15, 16] noted that the majority of core material was Fe(III), either goethite or lepidocrocite, and Herro [10] described cores of Fe(II) hydroxide, siderite and phosphates. The cores from the tubercles in this study consistently contained a predominance of Fe(III) minerals, i.e., goethite and lepidocrocite.

In the present study, stalks produced by IOB and biomineralized deposits were located in tubercles from two locations – DSH and HPIW (Figures 2 and 5). Extracellular iron biomineralization has been studied extensively in fresh water [17-20]. Some IOB extrude polymeric structures upon which they deposit the ferric iron derived from their metabolism. Chan et al. [21] concluded that polymer directed iron hydroxide mineralization is a general phenomenon that can occur in any system containing acidic polysaccharides and iron. Banfield et al. [22] suggested that negatively charged polymers (e.g., Gallionella stalks) served as templates for aggregates of enzymatically produced iron oxides. Ghiorse and Ehrlich [23] suggested that microbial mineral formation can take place in intimate association with cells forming mineralized structures. They further concluded that the resulting structures could be used to identify a biological role in the formation in the absence of viable cells. Working with hyphal budding bacteria, Ghiorse and Hirsch [24] described the accumulation of positively charged iron hydroxides on negatively charged bacterial polymers. Once deposited, the iron oxides carried negative charges so that such a process could continue indefinitely without any biological activity. The only required biological input is the initial production of a negatively charged polymer. Sogaard et al. [25] described a similar process for biological iron precipitation by *Gallionella* in a polluted ground water (pH 5). Iron precipitated on the surface of the stalks until the negative charge effect was eliminated. The colloidal iron was condensed and the result was a dense deposit. Mirot et al. [26] demonstrated precipitation of goethite on polymeric fibers extending from the cells of an iron-oxidizing bacterium. They also demonstrated a redox gradient, with the...
propion of Fe(III) highest near the cells and the proportion of Fe(II) increasing at distance from the cell. Bacteriogenic iron oxides, formed in response to chemical or bacterial oxidation of Fe(II) to Fe(III), are made up of intact and/or partly degraded remains of bacterial cells mixed with amorphous hydrous Fe(III) oxides [27]. Bacteriogenic iron oxides have reactive surfaces and act as sorbents of dissolved metal ions and enrichments of lead, cadmium, aluminum, chromium, zinc, manganese, and strontium, in addition to copper, have been reported [28, 29]. Sarin [15] reported the absorption of copper in iron corrosion scales. Gerke et al. [8] demonstrated that heavy metals, including copper, were either trapped within the structure or sorbed onto regions of the tubercles. There were differences in the heavy metals associated with the cores varied with location and within locations. In the present study, heavy metals were co-located with bacteriogenic iron oxides in two locations (DHS and HPIW). Bacterial stalks were not identified in the fibrous core of DWDS tubercles but heavy metals were concentrated in the core regions of DSH tubercles. A feature common to all DSH tubercles was a well-defined stratum of copper at the base of the tubercles. Concentrations of phosphorus, calcium, lead, nickel, copper and zinc were detected throughout core regions of DWDS tubercles. There were accumulations of lead within core regions of HPIW tubercles. Specific elements and concentrations of elements varied among tubercles from the same location. These differences may reflect differences in heavy metal concentrations in the fresh water in which the tubercle develops. Because of the limited water quality data available from the locations examined in this study it is impossible to relate differences in core chemistry to water chemistry.

The Herro [10] and Sarin [15, 16] models specifically describe tubercles associated with corrosion. Gerke et al. [8] described similar morphology, mineralogy and chemistry for tubercles developed in a DWDS, however, tubercles in the DWDS were not associated with localized corrosion. Angell [5] reported that the base of the tubercle was the source of “almost all of the iron that compromises the tubercle.” Herro and Port [30] estimated that tubercle height was 5 to 30 times as high remained the same over a three-year period, despite the deepening pit beneath them. Tubercles in the DWDS and HPIW were not associated with localized metal loss. The cores of DSH tubercles extended into the pits and were exact replicas of the pit interior. Ray et al. [7] demonstrated that corrosion of platings in DSH was due to a galvanic couple established between the copper layer and the iron substrate. The reducing conditions beneath the tubercles caused copper dissolved in the water to precipitate.

Data presented in this paper do not clarify the role of IOB in tubercle formation. Are IOB involved in tubercle formation or do tubercles in some environments provide conditions for IOB growth and biomineralization? Angell [5] suggested that tubercles provided anerobic niches for sulfate reducing bacteria (SRB) and some circumstances SRB could accelerate corrosion associated with tubercles. In an independent study, Lytle et al. [31] determined that some tubercles from the same DWDS examined in this study contained SRB.

5. Conclusions

The term “tubercle” does not describe a single morphology for corrosion products on carbon steel. The presence of tubercles on carbon steel cannot be used to conclude localized corrosion directly under the tubercles or a role for bacteria in their formation. The tubercles examined in this study did have features in common – a crust of lepidocrocite and goethite and a shell of magnetite. All tubercles had a core region, but the structure and chemistry of the cores differed. Stalks produced by iron bacteria were located in tubercles from two locations, but not the third.

Acknowledgements

This work was supported by the Office of Naval Research Program element 0601153N (6.1 Research Program), Dr. Linda Crisey at the Office of Naval Research Program element 0601153N.

References

This year marked a remarkable occasion for Winn and Coales International Ltd. The London based Denso anti-corrosion products manufacturer won the Queen’s Award for enterprise: International Trade. The award was won for growth in global sales, despite the worst recession in forty years. The Award which was announced on the Queen’s birthday is the result of the combined efforts of the company’s UK based staff, subsidiary companies and global network of agents.

Chairman David Winn OBE said “Winning this award recognises the amazing success we have achieved in establishing our products reliability and quality across the world despite recessionary times. It is also a reward for all of the effort and finance we have continually invested in developing new innovative products to solve our customers ever changing needs.”

On the 7th of July the official presentation of an engraved Award Crystal Bowl and Grant of Appointment took place at the company headquarters in London. The presentation was carried out by the Deputy Lieutenant, Rosi Prescott DL who was accompanied by Lambeth Councillor Jackie Meldrum representing the Rt. Hon Tessa Jowell MP. To celebrate this occasion the company held a barbeque for their 120 staff.

Following this, on the 19th of July in honour of winning the Queen’s Award, Executive Directors of Winn and Coales International Ltd; Brian Dunsterville and Chris Winn attended a special reception at Buckingham Palace to meet Her Majesty The Queen.

The Executive Directors confirmed that they are extremely proud of the consistent innovation that Winn and Coales International Ltd demonstrates. Receiving the prestigious Queen’s Award is a direct reflection of the quality, innovation, hard work and dedication that all the staff at the Winn & Coales International group put into the products and services they offer to their clients.
SPECIALISED COATINGS LTD RAISES THE BAR IN ANTICORROSIVE POWDER COATING SYSTEMS

Specialised Coatings Ltd is based in Halifax and employs 35 people within its 80,000 sq/ft facility and 3 acre sites.

Started in 1990 by David Wadsworth the family owned company moved to its current site over 10 years ago to expand its portfolio of services and also handle larger projects; the large yard area and good access being crucial factors in this.

Continuous Investment not just in plant and equipment but also in staff development has meant that Specialised Coatings Ltd are constantly ‘raising the bar’ in the type of work they can process.

On the powder coating front, Specialised Coatings Ltd are perhaps the UK’s largest Approved Applicator of Akzo Nobel’s anticrossive powder coating systems. SPC have the full technical back up of Akzo Nobel (the world’s largest paint company) and are part of their Service First Associate Programme whereby regular quality assessments by Akzo Nobel are undertaken throughout the production process to guarantee customer confidence in the coating application process.

Icorr Level 2 certification is also offered to give further peace of mind that specifications are understood and being followed.

SPC offer gritblasting and wet spraying/protective coating application of items upto 10 tons and over 12m in length. These systems commonly used for offshore, power generation and infrastructure and SPC are familiar with Norsok M-501, Wimes 4.01, Tota, BP and Shell specifications. To complement the above systems SPC holds a ZINGA approved applicator certificate.

Further investment is planned to improve efficiencies and keep Specialised Coatings Ltd at the forefront of coatings application.

The Institute of Corrosion would like to congratulate the following members with their upgrades during 2010.

<table>
<thead>
<tr>
<th>Technician</th>
<th>Professional upgrades</th>
<th>Fellow upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilmul Huda Khan</td>
<td>Adeiji Anjorin</td>
<td>Craig Stevenson</td>
</tr>
<tr>
<td>Tyrone Bailey</td>
<td>Sabrina Abdollah</td>
<td>Robert Greenwood</td>
</tr>
<tr>
<td>Patrick Eyles</td>
<td>Jonathan Crowther</td>
<td>Girish Gupta</td>
</tr>
<tr>
<td>Jason Ross</td>
<td>Vikram Prabhakaran</td>
<td>Fakhruddin Habib</td>
</tr>
<tr>
<td>William Whittaker</td>
<td>Andrew Oliver Simm</td>
<td>Kevin G Davies</td>
</tr>
<tr>
<td></td>
<td>Jamieson Christie</td>
<td>Paul Rostron</td>
</tr>
<tr>
<td></td>
<td>Chidi Iloka</td>
<td>Bashir Javed</td>
</tr>
<tr>
<td></td>
<td>Aman Rastogi</td>
<td>Peter Woodland</td>
</tr>
<tr>
<td></td>
<td>Ikechukwu Nzelu</td>
<td>Michael Billingham</td>
</tr>
<tr>
<td></td>
<td>Fakhruddin Habib</td>
<td>Lee Wilson</td>
</tr>
<tr>
<td></td>
<td>Christopher Spence</td>
<td>Paul Budzynski</td>
</tr>
<tr>
<td></td>
<td>Shakeel Ahmed</td>
<td>Stephen Mannion</td>
</tr>
<tr>
<td></td>
<td>Nelu Rusalim</td>
<td></td>
</tr>
</tbody>
</table>

For further information from: Mile Cross Works, Gibbet Street, Halifax, West Yorkshire, HX1 4JQ
Tel: 01422 356752  Fax: 01422 344558  www.specialisedcoatings.co.uk
On Wednesday 17th November 2010, Belzona, a design and manufacturer of industrial protective coatings and polymer repair composites, celebrated the launch of Deritend Industries as a Belzona Authorized Coating Centre (BACC) which will now complete the BACC initiative.

Achieving the BACC status now means that Deritend Industries are recognized by Belzona as a specialist service centre for the rebuilding, long term protection and efficiency enhancement of rotating equipment such as Pumps, Fans, Blowers, Screw Conveyors and Agitators. It is envisaged that this new partnership will further improve the level of support offered to customers and offer a full turnkey repair service on rotating equipment.

Darren Harris, Operations Manager for Deritend Industries commented, “Being an Belzona Approved Coating Centre will play a very important part of the Deritend Industries strategic goal going forward in the way of offering its customer energy saving solutions and whole life cost benefits. As a result, Belzona 1341 (Supermetalglide) a high performance coating for improving the efficiency of fluid handling equipment will be incorporated into the Deritend full energy efficient pump refurbishments. Deritend welcome the new partnership with Belzona and look forward to reaping mutual benefits for both parties.”

Belzona introduced the BACC scheme to differentiate and reward specialist service centres that invest heavily in surface preparation equipment and are dedicated to maintaining high levels of application procedures and customer service.

Gordon Cairns, National Sales Manager for Belzona explained, “The BACC concept was created to distinguish between regular machinery and equipment contractors and a specialist group of service centres that go the extra distance. This gives us the platform to target key industries that require a “total service” The launch of Deritend Industries now completes the BACC initiative as status has already been granted to companies based in Glasgow, Teesside, Leeds, Manchester and Southampton. The launch of Deritend Industries based in the Midlands now gives us complete coverage across the UK.”

Deritend Industries is one of the UK’s fastest growing and most dynamic maintenance services organisations, encompassing several specialist engineering operations within the group. The largest component of the group, Deritend, operates onsite electromechanical engineering teams and a nationwide branch network including engineering workshops placed strategically across the UK. The Group also includes a large UK based pre-formed windings production site, and other specialist engineering operations covering induction services, condition monitoring and machine tools services.
DENSOCLAD PROTECTION AGAIN CHOSEN FOR CHESHIRE BRINE FIELDS

In 2008 Winn & Coales Densoclad 70 and 70S were specified for the protection of 20km of buried pipeline used at Stublach, Cheshire, to connect natural gas storage cavities formed by the extraction of brine by Ineos Chlor and Gaz de France. As a result of its success in giving corrosion protection in the saline corrosive environment, Winn and Coales has again been chosen to supply Densoclad tape systems to wrap a further 18km of pipe varying from 2in to 18in diameter on Phase 2 of the project.

Metal Cleaning UK ltd won the contract to wrap the pipes at its factories in Bootle and Knowsley. The company used both hand operated Wrapping Machines and a Denso Motorised Rolling Rig. The Rolling Rig, which was originally designed to wrap pipe lengths of up to 6m, was refurbished and extended for this project to accommodate the 12m pipe lengths which were wrapped in the contract. The welded joints on site were hand wrapped with Densoclad 70.

Winn & Coales’ Densoclad 70 medium to heavy-duty tape is designed for anti-corrosion protection of medium and large diameter pipes, welded joints, bends and fittings. The extremely tough pvc backing combined with polymer bitumen adhesive ensures complete protection and exceptional resistance to damage by impact, poor backfill or aggressive ground conditions. Densoclad 70S has a stiffer pvc backing, which enables it to withstand greater tension when being applied on a motorised rolling rig.

PROTAL PROTECTION SPECIFIED FOR GAS MANIFOLDS

Bryan Donkin RMG Gas Controls of Chesterfield has recently completed manufacture of a pair of 24 inch diameter carbon steel gas manifolds. These are the first of four underground manifolds to be supplied for the National Gas Grid Windsor Street project in Birmingham.

For protection of the manifolds National Gas specified Winn & Coales Denso Protal brush coating. This was applied by J M Shotblasting, also of Chesterfield, following shotblasting to the SA 2½ standard. Two coats of Denso Protal were applied to give a total thickness of 1500 microns with a gramophone finish which will give zero gas leakage when connected to a gas main. J M Shotblasting also ensured that prior to coating all flange ends and bolt holes were cleaned out and protected.

Denso Protal coatings provide effective anti-corrosion coatings for metals. They do so by forming a firmly bound corrosion inhibiting film on the metal surface and by covering the surface with a thick, effective physical barrier against air and moisture and which remains permanently flexible. A grade is available which can be applied by plural Hydrocat spray.

For further information from: Winn & Coales (Denso) Ltd, Chapel Road, London SE27 OTR
Tel: 020 8670 7511  Fax: 020 8761 2456  e-mail: mail@denso.net  Website: www.denso.net
Industrial services specialist Pyeroy has invested £250,000 in a new HAKITEC 750 weather protection system to improve its services to marine customers.

The move will enable the fast growing Gateshead-based firm to increase its capacity to support the refitting of Royal Navy vessels and the construction of new ones like the next generation of aircraft carriers currently being built at yards around the UK.

The HAKITEC system will enable Pyeroy to span much wider areas to provide improved access and protection for its teams of contractors, ensuring projects can be completed easier and quicker.

Part of the latest investment included some specially designed and manufactured components enabling Pyeroy to overcome some of the more complex areas of the vessels.

The new equipment will used on the multi-million pound contract to provide specialist coatings for the Royal Navy’s new Queen Elizabeth class aircraft carriers where it will be used to span the 70 m wide flight decks - twice the width of the existing Invincible class aircraft carriers.

Pyeroy is the UK market leader in the provision of specialist protective coatings within the marine sector, and has extensive experience in undertaking large Royal Navy projects having undertaken in excess of £100m of contracts over the last seven years to a multitude of vessels including the three present aircraft carriers: HMS Ark Royal, HMS Illustrious and HMS Invincible.

Jack Hayton, director of Pyeroy’s Marine Division, said: “We are working on many contracts and our ongoing success in undertaking these projects for the Royal Navy recognises the skills and workmanship of our workforce. “So, we have made the investment in new HAKITEC equipment to ensure our shipyard operations are capable of meeting existing and future customer requirements and delivering high standards of service.”

HAKI is the European marketing leader in weather protection and containment systems and, in addition to manufacturing its own products, provides training and engineering support to Pyeroy.

For further information from: Kirkstone House, St Omers Road, Western Riverside Route, Gateshead, Tyne and Wear NE11 9EZ Tel: 0191 493 2600 Fax: 0191 493 2601 Website: www.pyeroy.co.uk

NEW PYEROY CONTAINMENT EQUIPMENT BOOST FOR SERVICE
COATING APPLICATORS

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

ALLTASK LTD
Alltask House, Commissioners Road,
Medway City Estate, Strood, Rochester Kent ME2 4EJ
Tel: 01634 298000  Fax: 01634 298001
Website: www.alltask.co.uk

APB CONSTRUCTION (UK) LTD
Unit 3 Bramley Way, Hellaby Industrial Estate
Hellaby, Rotherham South Yorkshire  S66 8QB
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

COASTAL PRESERVATION SERVICES LTD
Cld Hambledon 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

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

F A CLOVER & SON LTD
INDUSTRIAL PAINTING CONTRACTORS SINCE 1917
225 London Road, Greenhithe, Kent DA9 9RR
Tel: +44 (0)1322 387 000  Fax: +44 (0)1322 370235
Email: works@fwadart.co.uk  Website: fwagroup.co.uk

FAIRHURST WARD ABBOTS LTD
Tel: 020 89486321  Fax: 020 89487307
Email: ian@cloverpainting.com

GABRE (UK) LTD
9 Holme Road, Curraghmuckin, Dromore,
Tyrone BT78 3BX
Tel: 02882897950  Fax: 02882898303

GALCO STEEL LTD
HOT DIP GALVANIZERS & STEEL FABRICATORS
Tel: 01 4506671  Fax: 01 4566213
Email: info@galcosteel.ie

GARDWELL COATINGS LIMITED
Ellough Road, Beccles, Suffolk, NR34 7TE
Tel: 01502 712793 / 717200  Fax: 01502 71636
Email: sales@gardwellcoatings.co.uk  Website: www.gardwellcoatings.co.uk

GEMINI CORROSION SERVICES LTD
Spurryhillock Industrial Estate, Broomhill Road,
Stonehaven AB39 2NH
Tel: 01569 765488  Fax: 01569 766315

CORROCOAT-CORROSIONEERING

- Specialists in anti-corrosion engineering and corrosion protection
- Fast, efficient and economical solutions to corrosion-related problems
- Combining engineering skills and coating excellence for long term solutions
- Repair and refurbishment for components from pumps, pipes and valves through to tanks and vessels
- On-site teams and workshop-based facilities

Tel: 0113 276 0760  Fax: 0113 276 0700
Email: info@corrocoat.com  www.corrocoat.com

Reader Enquiry: CM015

Hankinson Blasting & Protective Coatings Division

0870 789 2020  www.hankinson.co.uk
Alexander House, Monks Ferry, B/thead, Wirral CH41 5LH

- NHSS19A - Link Up - Proof
- CHAS - ISO 9001 & ISO 14001
- Constructionline

Reader Enquiry: CM015
**SUSTAINING MEMBERS**

**Corrosion Management | November/December 2010**

---

**COATING APPLICATORS**

**HERRINGTON INDUSTRIAL SERVICES LTD**
CRIT BLASTING, 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.herrington@btopenworld.com  Website: www.herringtonltd.co.uk

**INDUSTRIAL SUPPORT SERVICES LTD**
Specialists in Abrasive Blast Cleaning, UHP Water Blasting, Coating Application, Hydro Demolition, Project Management
Building 5146, South Yard, HMNB Devonport, Plymouth, PL2 2BG
Tel: 01752 552515  Fax: 01752 554607
Mobile: 07979 516427

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

**INDUSTRIAL COATING SERVICES**
5 Danesbury Crescent, Kingstanding, Birmingham, B44 0QP
Tel: 0121 384 2266  Fax: 0121 384 8221
Email: enquiries@industrialcoatingservices.co.uk
www.industrialcoatingservices.co.uk

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

**KUE Group Limited**
Birklands 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@fairfieldmabey.com

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

**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**
Lymane, Hythe, Kent CT21 4LR
Email: simon.slinn@nusteelstructures.com
Website: www.nusteelstructures.com

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

**ORRMAC COATINGS LTD**
Newton Chambers Road, Thorncliffe Park Estate, Chapeltown Sheffield S35 2PH
Tel: 0114 2461237  Fax: 0114 2570151
Email: orrmac@aol.com  Website: www.orrmac.co.uk

**Pipeline Induction Heat Ltd**
The Pipeline Centre
Farrington Road, Rosendale Road Industrial Estate
Burnley, Lancs BB11 5SW
Tel: 01254 415323  Fax: 01254 415326
Email: Sales@pih.co.uk  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

---

**RHINOCEROS**
SPECIALIST CLEANING + PROTECTIVE COATINGS
INFRASTRUCTURE MAINTENANCE
• Sector 19A Approved
• ICATS Trained Operators
• Clients: Transport for London
  Edinburgh City Council
  Manchester City Council
  Coventry City Council

t 020 8644 4165
e contracts@rhino247.co.uk
w www.rhino247.co.uk

---

**IMPACT**

---

**Reader Enquiry:** CM135
COATING APPLICATORS

ROWECORD ENGINEERING LTD
Neptune Works, Usk Way, Newport, South Wales NP20 2SS
Tel: 01633 250511 Fax: 01633 253219
Email: enquiries@rowecord.com

SHUTDOWN MAINTENANCE SERVICES LIMITED
Tel: 01634 256969 Fax: 01634 256616
Email: smssld@btconnect.com
Website: www.shutdownmaintenance.co.uk

SITE COAT SERVICES LTD
Unit 11, Old Wharf Road, Grantham, Lincolnshire NG31 7AA
Tel: 01476 577 473 Fax: 01476 577 642
Website: www.sitecoat.com

SPECIALISED COATINGS LTD
Mile Cross Works, Gibbet Street, Halifax, West Yorkshire, HX1 4JQ
Tel: 01422 356792 Fax: 01422 344558

• Grit Blasting and Specialist coatings
• Steelwork repairs
• Concrete / Brickwork repairs
• ICATS trained
• Linkup. UVDB. NHSS19A

STANDISH METAL TREATMENT LTD
Potter Place, West Pimbo, Skelmersdale
Lancs, WN8 9PW
Tel: 01695 455977 Fax: 01695 728835
Email: stuart.croft@standishmetal.co.uk

STRADA CONTRACTORS LIMITED
Unit 9, Portsmouth Enterprise Centre, Quartremain Road, Portsmouth, Hants PO3 5QT
Tel: 02392 666109 Fax: 02392 664845
Email: info@strada-contractors.co.uk
Website: www.strada-contractors.co.uk

TEES VALLEY COATINGS LIMITED
Unit 26, Dawson Wharf, Riverside Park Road, Middlesbrough TS2 1UT
Tel: 01642 228141
Email: sales@teesvalleycoatings.com
Website: www.teesvalleycoatings.com

WALKER CONSTRUCTION (UK) LIMITED
Park Farm Road, Folkestone, Kent CT19 5DY
Tel: 01303 851111 Fax: 01303 259439
Email: admin@walker-construction.co.uk

WATSON STEEL STRUCTURES LTD
Lostock Lane, Lostock, Bolton BL6 4BL
Tel: 01204 699999 Fax: 01204 694543
Email: dave.swift@watsonsteel.co.uk

WEDGE GROUP GALVANIZING LTD
Stafford Street, Willenhall, West Midlands WV13 1RZ
Tel: 0845 271 6082
Email: info@wedge-galv.co.uk
Website: www.wedge-galv.co.uk

W G BEAUMONT & SON LTD
INDUSTRIAL PAINTING CONTRACTORS
Unit L1, Chadwell Heath Industrial Park, Kemp Road, Dagenham RMB 15L
Tel: 020 85908523 Fax: 020 85909885
Email: tom.costello@wgbeaumont.co.uk

WILLIAM HARE LTD
Brandlesholme House, Brumblesholme Road, Bury BL8 1JJ
Tel: 0161 609 0000 Fax: 0161 609 0468
Email: jeff.grundy@hare.co.uk  www.williamhare.co.uk

CONSULTANTS TESTING AND INSPECTION

ATKINS LTD
Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW
Tel: 01372 726140 Fax: 01372 740055
Email: iain.wesley@atkinsglobal.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

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

CHEMCO INTERNATIONAL LTD
Units 3a & 3b, East Shawhead Industrial Estate, Coatbridge, Lanarkshire ML5 4LY
Tel: 01236 606060 Fax: 01236 606070

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

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
MANUFACTURE AND SUPPLY OF SPECIALISED COATINGS
Tower Works, Kestor Street, Bolton BL2 2AL
Tel: 01204 521771 Fax: 01204 382115
Email: info@corrocoat.com www.corrocoat.com

PPG PROTECTIVE & MARINE COATINGS
Sales Office Industrial Protective Coatings
Micro House, Station Approach
Wood Street North, Alfreton DE55 7JR
Tel: +44 (0) 1773 837 300 Fax: +44 (0) 1773 837 302
Email: uksalesalfreton@ppg.com www.ameron-bv.com

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

STOPAQ UK LTD
Court House Farm Units, Court House Farm
Breerton, Cheshire CW11 1RL
Tel: 0845 071 0688 Fax: 0845 071 0689
Email: info@stopaq.co.uk Website: www.stopaq.co.uk

Reader Enquiry: CM016

DensO
Leaders in Corrosion Prevention & Sealing Technology
Long-term Solutions for Corrosion Control
Winn & Coales (Denso) Ltd
Denso House, Chapel Road, London SE27 OTR
Tel: 020 6970 7311 Fax: 020 671 2456 Email: mail@denso.net Web: www.denso.net
1883-2008 125 Years Service to Industry

Reader Enquiry: CM016
DOORNBOS EQUIPMENT
Tel: 01642 673391 Fax: 01642 673210
Email: sales@doornbosequipment.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

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

HODGE CLEMCO LTD
Abrasives Works, Gibson Lane, Melton, North Ferriby, East Yorkshire, HU14 3HN
Tel: 01482 633305 Fax: 01482 634835
www.hodgeclemco.co.uk

IICORR
INTEGRITY INSPECTION CORROSION
1 Minto Place, Altens Industrial Estate, Aberdeen, AB12 3JN
Tel: 01224 898282 Fax: 01224 898202
Email: info@iicorr.com Website: www.iicorr.com

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

JETCHEM SYSTEMS LIMITED
Cuba Industrial Estate, Stubbs, Ramsbottom, Lancashire BL0 1NE
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

PAROC GROUP
Technical Insulation
Manufacturers of High Quality Mineral Wool Products
PO Box 294, F1-01301 Vantaa, Finland
UK Sales office Tel: 01942 814127 Fax: 0870 7628257

RA MATERIALS & FOUNDRIES
Park Works, Newton Heath, Manchester M40 2BA
Tel: 0161 9544213 Fax: 0161 2054739

RGL SERVICES
TEL: 02380812921 FAX: 02380814016
e: enquiries@rglservices.co.uk
www.rglservices.co.uk

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

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

QUALITY CONTROL

Measure • Monitor • Improve

+44 (0) 161 371 6000
sales@elcometer.com
www.elcometer.com

TRAINING AND COATING INSPECTORS

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.ruanetpo.com
### ICATS REGISTERED COMPANIES WITH QUALIFIED APPLICATORS

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Telephone Number</th>
<th>Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alltask Limited</td>
<td>Alltask House, Commissioners Road, Strood, Kent, ME2 4EJ</td>
<td>01634 298000</td>
<td></td>
</tr>
<tr>
<td>Alfred Bagnall &amp; Sons</td>
<td>6 Manor Lane, Shipley, West Yorkshire, BD18 3RD</td>
<td>01302 853259</td>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>Austin Hayes Ltd</td>
<td>Carlton Works, Cemetery Road, Yeadon, Leeds, LS19 7BD, UK</td>
<td>0113 250 2255</td>
<td></td>
</tr>
<tr>
<td>Beever Limited</td>
<td>Little Coldharbour farm, Tong Lane, Lamberhurst, Kent, TN3 8AD, UK</td>
<td>01892 890045</td>
<td></td>
</tr>
<tr>
<td>Briton Fabricators Ltd</td>
<td>Watnall Road, Hucknall, Notts, NG15 6EP</td>
<td>0115 963 2901</td>
<td></td>
</tr>
<tr>
<td>Cameron Limited</td>
<td>Queen Street, Stourton, Leeds, LS10 1SB, UK</td>
<td>0113 276 4389</td>
<td></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>
<td></td>
</tr>
<tr>
<td>Cleveland Bridge UK Ltd</td>
<td>Cleveland House, Yarm Road, Darlington, DL1 4DE</td>
<td>01325 502345</td>
<td></td>
</tr>
<tr>
<td>Coating Services Ltd</td>
<td>Partington Street, Mumps Bridge, Oldham, OL1 3RU, UK</td>
<td>0161 665 1998</td>
<td></td>
</tr>
<tr>
<td>Collins Engineering Railway Contracts</td>
<td>Salcombe Road, Meadow Lane Industrial Estate, Alfreton, Derbyshire, DE55 7RG</td>
<td>01773 833255</td>
<td></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>
<td></td>
</tr>
<tr>
<td>Concrete TS Ltd</td>
<td>Unit B2 (2), Moss Industrial Estate, Leigh, Lancs, WN7 3PT, UK</td>
<td>01942 261909</td>
<td></td>
</tr>
<tr>
<td>Corrocoat</td>
<td>Forster Street, Leeds, LS10 1PW</td>
<td>01132760760</td>
<td></td>
</tr>
<tr>
<td>Denholm Industrial</td>
<td>21 Boden Street, Glasgow, G40 3PU</td>
<td>0141 445 3939</td>
<td></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>
<td></td>
</tr>
<tr>
<td>F A Clover &amp; Son Ltd</td>
<td>Bardolph Road, Richmond Surrey, TW9 2LH</td>
<td>0208 948 6321</td>
<td></td>
</tr>
<tr>
<td>H&amp;H Painting Contractors Ltd</td>
<td>4 Hamilton Gardens, Mutley, Plymouth, PL4 6PQ</td>
<td>07837 382619</td>
<td></td>
</tr>
<tr>
<td>Hyspec Services Ltd</td>
<td>Unit 3 Meadowfield Industrial Estate, Cowdenbeath Road, Burntisland, Fife, KY3 0LH</td>
<td>01592 874661</td>
<td></td>
</tr>
<tr>
<td>Industrial Coating Services</td>
<td>5 Danesbury Crescent, Kingstanding, Birmingham, B44 0QP</td>
<td>0121 384 2266</td>
<td></td>
</tr>
<tr>
<td>Interserve Industrial</td>
<td>Unit 2, Olympic Park, Poole Hall Road Ellesmere Port, Cheshire, CH66 1ST</td>
<td>0151 3737660</td>
<td></td>
</tr>
<tr>
<td>Jack Tighe Coatings</td>
<td>Sandall Lane, Kirk Sandall, Doncaster, DN3 1QR</td>
<td>01302 880360</td>
<td></td>
</tr>
<tr>
<td>Jack Tighe Ltd</td>
<td>Redbourne Mere, Kirton Lindsey, Gainsborough, Lincs, DN21 4NW, UK</td>
<td>01652 640003</td>
<td></td>
</tr>
<tr>
<td>Lanarkshire Welding Co.</td>
<td>82 John Street, Wishaw, Lanarkshire, ML2 7TQ</td>
<td>01698 264271</td>
<td></td>
</tr>
</tbody>
</table>
Maclean and Speirs
Unit D, East Fulton Farm, Darluith Road, Linwood, PA3 3TP
T: 01505 324777

Merseyside Coatings Ltd
Pickerings Road, Halebank Industrial Estate, Widnes, Cheshire, WA8 BXW
T: 0151 423 6166

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

Nusteel Structures
Lympne Industrial Estate, Lympne, Hythe, Kent, CT21 4LR
T: 01303 268112

P&R Engineering Ltd
Unit 50/51 Cable Street, Wolverhampton, WV2 2HX
T: 01902 870637

Paintel Ltd
26 St George’s Road, Saltash, Cornwall, PL12 6EH
T: 07730 691227

Palmers Ltd
1120 Elliot Court, Herald Avenue, Coventry Business Park, Coventry, CV5 6UB
T: 02476 710294

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

Pyeroy Limited
Kirkstone House, St Omers 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 2S5
T: 01633 250511

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

Site Coat Services Ltd
11 Old Wharf, Grantham Lincs, NG31 7AA
T: 01476 577473

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

Strada Contractors Ltd
Unit 9, Portsmouth Enterprise, Quartremaine Road, Portsmouth, PO3 5QT
T: 02392 666109

Supablast Nationwide
Jubilee Estate, Gorsey Lane, Coleshill, Birmingham, B46 1JU
T: 01675 464446

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

Walker Construction
Park Farm Road, Folkstone, DA9 9RR
T: 01322 387000

Wardle Painters Ltd
Unit 5, Wimborne Building, Atlantic Way, Barry Docks, Glamorgan, CF63 3RA, UK
T: 01446 748620

William Hare Ltd
Brandleholme House, Brandleholme Road, Bursy, Lancs, BB9 1JU, UK
T: 0161 609 0000

ICATS REGISTERED COMPANIES WITH APPLICATORS IN TRAINING

Abrasion Ltd
1 Montague House, 74 Bryantwood Road, London, N77BB
T: 07949 130168

ENC (Yorkshire) Ltd
Unit 3B Rotherham Road, Dinnington Sheffield, S25 3RF
T: 01909 567860

Fairhurst Ward Abbotts
225 London Road, Greenhithe, Kent, DA9 9RR
T: 01322 387000

Gemini Corrosion
Brookhill Road, Spurryhilllock Industrial, Stonehaven, Aberdeenshire, AB39 2NH
T: 01569 765488

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

Matatec Ship Repairers
MacGregor House, Seaton Delaval Tyne & Wear, NE25 0PT
T: 0191 2379900

P C Richardson & Co
Courville House, Eliberbeck Court, Stokesley Business Park, Stokesley, TS9 5PT, UK
T: 01642 714791

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

T&T Coatings Ltd
Snowdon House, Snowdon Road, Middlesborough, TS2 1DY, UK
T: 01642 247972

W G Beaumont & Son
Unit L1, Chadwell Heath Industrial, Kemp Road, Dagenham, RM8 1SL
T: 0208 590 8523
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbey Gritblasting Services</td>
<td>Unit 13, Clopton Commercial Park, Clopton, Woodbridge, Suffolk, IP12 3TP</td>
<td>0191 262 0510</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>Carrodus Contractors Limited</td>
<td>Unit 134, Medway Enterprise Centre, Enterprise Close, Strood, Kent, M62 4SY</td>
<td>01634 271786</td>
</tr>
<tr>
<td>Celtic Painting Consultancy Ltd</td>
<td>Rosedale, Careicklen Lane, Langstone Newport, Gwent, NP18 2JZ</td>
<td>01633 40019</td>
</tr>
<tr>
<td>Coastground Ltd</td>
<td>Morton Peto Road, Capton Hall Industrial, Great Yarmouth, Norfolk, NR31 0LT</td>
<td>01493 650455</td>
</tr>
<tr>
<td>Coastline Preservation Ltd</td>
<td>Tredarport Wharf, Marine Parade Southampton, Hants, SO14 5JF</td>
<td>02380 221480</td>
</tr>
<tr>
<td>E &amp; P Painting Contractors</td>
<td>Rossfield Road, Rossmore Trading Estate, Ellesmere Port, Cheshire, CH65 3AW</td>
<td>0151 9558141</td>
</tr>
<tr>
<td>Forward Protective</td>
<td>Vernon Street, Shirebrook, Mansfield Notts, NG20 8SS</td>
<td>01623 748323</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>G W Burton Ltd</td>
<td>New Court, Wooddalling, Norwich, Norfolk, NR11 6SA</td>
<td>01263 584203</td>
</tr>
<tr>
<td>GPS Services &amp; Distribution Ltd</td>
<td>Alexandra Business Park, Riverside South, Pallion, Sunderland, Tyne &amp; Wear, SR4 6UG</td>
<td>01753 654123</td>
</tr>
<tr>
<td>GCS Painting Contractors Ltd</td>
<td>61 Portland Road, Selston, Nottingham, NG16 6AS</td>
<td>01773 860983</td>
</tr>
<tr>
<td>H &amp; S Decorating</td>
<td>Administration Building, Forth Road bridge, South Queensferry, Edinburgh, EH30 9SF</td>
<td>01753 654123</td>
</tr>
<tr>
<td>Hempel UK Ltd</td>
<td>Llantarnam Park, Cwmmran, Gwent, NP44 3XF</td>
<td>01633 874024</td>
</tr>
<tr>
<td>Hill Price Associates Ltd</td>
<td>Hill Price Associates Ltd, 3 Prospect Place, The Maritime Quarter, Swansea, SA1 1QP</td>
<td>01792 544255</td>
</tr>
<tr>
<td>Leights Paints</td>
<td>Tower Works, Kestor Street, Bolton, Lancs, BL2 2AL</td>
<td>01698 264271</td>
</tr>
<tr>
<td>Malakoff Limited</td>
<td>North Ness, Lerwick, Shetland, ZE1 0LZ, UK</td>
<td>01595 695544</td>
</tr>
<tr>
<td>Matthew James Services</td>
<td>Unit 4, Shibdon Business, Cowen Road Blaydon, Newcastle-Upon-Tyne, NE21 5TX</td>
<td>0191 414 5700</td>
</tr>
<tr>
<td>Metal Cleaning UK Ltd</td>
<td>Randles Road, Knowsley Business Park, Knowsley, Merseyside, L34 9HX</td>
<td>0151 5492449</td>
</tr>
<tr>
<td>MIS Services Ltd</td>
<td>Unit 12 Laurence Industrial, Eastwoodbury Lane, Southend-On-Sea, Essex, SS2 6RH</td>
<td>01702 520400</td>
</tr>
<tr>
<td>Offshore Marine Services Ltd</td>
<td>Brumby House, Jalan Bahasa, PO Box 80148, 87011 Lubuan F.T. Malaysia</td>
<td>+603621424410</td>
</tr>
<tr>
<td>Opus Industrial Services</td>
<td>Ethan House, Royce Avenue, Cowpen Industrial, Estate, Billingham, TS23 4BX, UK</td>
<td>01642 371850</td>
</tr>
<tr>
<td>Orrmac Coatings Ltd</td>
<td>Newton Chambers Road, Thorncroft Park Estate, Chapeltown, Sheffield, S35 2PH</td>
<td>0114 246 1237</td>
</tr>
<tr>
<td>Prize Spraying</td>
<td>Easdale, Carlton Colville, Lowestoft Suffolk, NR33 8WL</td>
<td>01502 564437</td>
</tr>
<tr>
<td>R A Materials &amp; Foundries</td>
<td>Unit 19, Heysham Business Park, Middleton Road, Heysham, Lancs, LA3 3PP</td>
<td>01606 723426</td>
</tr>
<tr>
<td>R.L.P. Painting</td>
<td>Heathfield House, Old Bawtry Road, Finningley, Doncaster, DN9 3DD, UK</td>
<td>01302 772222</td>
</tr>
<tr>
<td>Steel Protection Consultancy Ltd</td>
<td>7a High Street Mews, High Street, Leighton Buzzard, Beds, LU7 1EA, UK</td>
<td>01525 852500</td>
</tr>
<tr>
<td>Sussex Blast Cleaning</td>
<td>Unit 35-37 Station Road, Hailsham, East Sussex, BN27 2ER</td>
<td>01323 849229</td>
</tr>
<tr>
<td>TEMA Engineering Ltd</td>
<td>5-6 Curran Road, Cardiff, CF10 5DF, UK</td>
<td>020920 344556</td>
</tr>
<tr>
<td>Tees Valley Coatings</td>
<td>Riverside Park Road, Middlesbrough, Cleveland TS2 1UT</td>
<td>01642 228141</td>
</tr>
<tr>
<td>The Renovate Services Co.</td>
<td>Amlwch Industrial Estate, Anglesey, LL68 9BQ</td>
<td>01407 831331</td>
</tr>
<tr>
<td>Watson Steel Structures</td>
<td>Lostock Lane, Lostock, Bolton, BL6 4BL</td>
<td>01204 699999</td>
</tr>
</tbody>
</table>
DIARY DATES 2010/11

13th January 2011
London Branch Meeting
Speaker: Jim Solomon BEng CEng MICE. CARE Accredited Conservation Engineer. Associate at Buro Happold Ltd ‘The Cutty Sark Conservation Project’
Venue: Naval Club, 38 Hill Street, London W1 17.30 for 18.15 start

10th February 2011
London Branch joint meeting with NACE UK
Speaker: John Thirkettle, Consultant, Thor Corrosion: ‘Corrosion control in industrial plants’.
Venue: Naval Club, 38 Hill Street, London W1 17.30 for 18.15 start

27th February - 1st March 2011
Corrosion UAE 2011 Abu Dhabi
Co-hosted by NACE UAE Section, this event is promising to be an excellent event covering both the technical and strategic issues prevalent in the industry.
You can find more more at www.theenergyexchange.co.uk/corrosionuae

10th March 2011
London Branch Meeting
Speaker: Sean Corr: ‘Modern developments in aviation corrosion protection’
Venue: Naval Club, 38 Hill Street, London W1 17.30 for 18.15 start

1st - 3rd November 2011
The Surface World Show 2011 with Correx
Venue: Pavilion NEC, Birmingham CORREX 2011 will be a major event in the UK corrosion industry aimed at everyone interested in coatings and cathodic protection: engineers, specifiers and practitioners.
Conferences, workshops, courses and seminars will run in tandem with the exhibitions.
For more information contact Nigel Bean on: Tel: +44 (0) 1442 826826 Email: nigelbean1aol.com
Web: www.surfaceworldshow.com

19th May 2011
Corrosion Engineering Division (CED) Working Day/Seminar
Venue: The National Physical Laboratory (NPL), Teddington
We are looking for offers of lectures on novel corrosion prevention technologies, please contact Nick Smart nick.smart@serco.com or Douglas Mills douglas@harbridge.freeserve.co.uk.
Full details for this event will be in the next issue of Corrosion Management magazine.

London Branch publish a monthly Newsletter Details of all Branch activities, dates and venues can be found at www.icorr.org

BRANCH CONTACT DIRECTORY

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

DUBLIN:
Martha Hidalgo (Secretary)
Tel: +353 01 4027945

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

NORTH EAST:
Brendan Fitzsimons
Tel: 0191 493 2600

LONDON:
Brian Goldie (Chairman)
Tel: 0208 644 9977
Email: BrianPCE@aol.com
Geoff White (Secretary)
Tel: 01728 602289
Email: geoff.white237@btinternet.com

ROSS FIELDING
Ross Fielding (Chairman)
Tel: 01476 906666
Email: ross.fielding@cathodic.co.uk

NORTH WEST:
Jane Lomas,
AMTEC Marine Corrosion
Tel: 01928 734996
Email: amteccorrosion@gmail.com

YORKSHIRE:
Nigel Peterson-White
Tel: 01422 356752
Email: nigel@specialisedcoatings.co.uk
Young ICorr Chairman:
Oliver Lewis
Email: oliver.lewis@shu.ac.uk

CSD Division:
Nick Stevens
Tel: 0161 306362

CED Division:
Nick Smart
Tel: 01635 280385