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The President Writes...

Just realised how quickly the end of the year approaches, and so much still to do. Correx 2009 is barely over and we’re desperately trying to fit in AGMs and seasonal dinners and lunches while coping with the traditional end of year panic when folks realise they’ve promised to get something sorted before the New Year. For all those who attended Correx 2009 at the NEC, I do hope you enjoyed the experience. I was in a couple of lively technical sessions and had a thoroughly good time. That said, the seminar areas were a little tent-like in construction and we did suffer for a while from noisy neighbours. It turned out Greenday were practicing in the adjacent Arena and from the constant atonal rumble they generated it sounded like they needed it (alternative aside for the under 30’s - ‘yeh, great, right on.’ I can be surprisingly hip at times, Daddy-O). Amidst this impromptu tribute to MASH, complete with occasional pyrotechnics, we had some truly excellent presentations and I thank all who contributed.

Thank you also to those who responded to me about last issue’s photograph. No correct answers, I’m afraid, and I may have to get the authorities involved with one suggestion (you know who you are), so I will have to tell you the answer. I was outside the famous/infamous Dakota Building in Manhattan next to Central Park where, amongst many other events, John Lennon sadly met his end. The money goes to Children in Need.

My photo this time is from Albania where, surprise surprise, we found some ‘challenged’ reinforced concrete. The EU had very kindly allocated some money to help assess their bridge stock with a view to prioritising the refurbishment and generally improve the infrastructure of the country. As you can probably guess, this is neither going to be easy nor cheap. Good luck to them, I say. Plus, I can now add an Adriatic location to the oft-trailed Mediterranean rust rambles, some places still available. All of them, actually.

Now, while I remember, there was something I was going to mention. Looking through our membership records I realised we have a large number of individuals with long and varied experience in the corrosion business who have been content to maintain their current level of membership for years and years. So while you are taking advantage of the brief respite that the Christmas holiday period brings, why not take a look at the requirements for transfer to professional grade if you’re an ‘ordinary’ member, or to fellow if you are already a professional member. And before you ask, it’s not just an excuse to blag an extra £20-odd quid out of you. Think of it as a Christmas present to yourself – and a boost to the Institute’s professional standing. So wherever you are, and whatever your traditions and beliefs, have a very pleasant time this forthcoming holiday season and a peaceful and successful 2010. As they say in Albania, Gëzuar Krishtëlindjen dhe Vitin e Ri (A Merry Christmas and a Happy New Year).

MIDLAND BRANCH – INAUGURAL MEETING

Thursday 21st January 2010 – 18.30 to 20.30 hrs
Holiday Inn Express – Walsall: Just off M6 at Junction 10

It’s about time, given the corrosion control related activities undertaken within this vibrant region; the Midland Branch is being re-formed. The Midland Branch of the Institute of Corrosion was once THE most active in ICorr, it ran regular seminars for members and others with interests in corrosion, it ran the successful major international conferences on Cathodic Protection and it participated strongly in the technical activities of the Institute.

Hold on to your electrodes, things are going to start moving.

The evening will kick off with an introductory talk by the President of ICorr Professor Paul Lambert, “Corrosion and its Control in an Historical Perspective”. Paul is famous for his entertaining presentations; this will be both fun and stimulating.

This will be followed by:
• Election of Committee Members
• Planned events for the next 12 months
• Any Other Business

Any attendee who is a member of ICorr and is willing to take on a roll as a committee member will be encouraged to do so. We are looking to form a strong Committee with young and enthusiastic members supported by a few old hands who have long term experience in ICorr.

Ideas for ICorr sponsored events will be taken from the floor, so start putting your thinking caps on.

Confirmation of your planned attendance is requested by 6th January 2010 latest, to assist us to finalise arrangements with the venue. Complimentary Buffet, Refreshments and directions to the venue will be provided to all attendees who advise their intention to attend. Please respond to the Institute Office admin@icorr.com and Brian Wyatt brianwyatt@controlcorrosion.co.uk marking your mail MIDLAND BRANCH ATTENDANCE.

Event Sponsored by Impalloy Limited, Bloxwich, West Midlands.
**NEWS FROM CORREX LTD**

**Fight against corrosion boosted with Conference**

The battle against corrosion, which costs industry billions of pounds each year, took a significant step forward at the UK Corrosion Conference held at the NEC, Birmingham.

Leading experts from across the whole anti-corrosion spectrum gave state of the art presentations to more than 250 session delegates attending the three day event, which was held in conjunction with the Correx and Surface World exhibitions.

Two conference rooms inside the exhibition hall ran lectures concurrently, with topics ranging from the application of coatings on iron and steel bridges to cathodic protection (CP) of offshore wind farm foundations.

Managers representing some of the UK’s most iconic structures, including Barry Colford of the Forth Road Bridge and Martin Earlam of the Thames Barrier, shared their knowledge with consultants, academics, coatings manufacturers, inspectors, transport and pipeline specialists and many others.

The event was the launching pad for a new insurance initiative that will have major benefits for both those practising anti-corrosion activity and the owners of the structures being protected. The ICATS Guarantee Scheme provides indemnity for the cost of repair and reinstatement of insured works to their original condition based on manufacturing defects, unsuitability of works and faulty or defective application of protective coatings.

The scheme, which gives ‘no blame’ cover for structures for up to nine years, is available to all registered companies and employees who have undertaken the ICATS training programme developed by Correx Limited.

John Meadows, Director of MRSL, told delegates: “The insurance industry has always been wary of guarantees relative to failure of works to perform. However, with the advances being made by the ICATS training board, it has finally been possible to give this comfort.”

Paul Lambert, President of the Institute of Corrosion, delivered a fascinating plenary lecture, ‘From Sir Humphry Davy to Sustainability – 185 years of Cathodic Protection’, which concluded that the pioneering work conducted on British naval vessels in the early 19th century still forms the foundation of modern CP techniques today, despite the many technological advances made.

In conjunction with the sessions, the three days featured a number of workshops covering the ICATS scheme, coating instrumentation, British standards for CP and CP in offshore, pipeline and building applications.

For more information on the Conference or the ICATS Guarantee Scheme, visit www.correx.org, email correx@icorr.org or telephone 01525 851771.
REPORT ON EUROCORR 09
HELD IN NICE 6TH-10TH SEPTEMBER

By Douglas J Mills

You may remember that last year’s very successful EuroCorr conference took place in Edinburgh and was partly organised by the Institute of Corrosion. This year’s was held in France at the Acropolis Convention Centre in Nice. The title was “Corrosion from the Nanoscale to the Plant” and it ran from 6th to 10th September.

As in the previous year the number of delegates topped the 800 mark. There were 25 sessions and work shops with 365 oral presentations and 204 posters. Up to 9 sessions took place simultaneously.

There was a good sized exhibition area, and near to this the posters were displayed and coffee and lunches were served. Within the conference were the usual EFC business activities with working party meetings and EFC meetings. Your correspondent attended the General Assembly (GA) on behalf of ICorr. There is a new President Philippe Marcus and there are plenty of interesting initiatives in relation to expanding the activities and the membership base of the EFC eg to include organisations outside Europe (including possibly NACE (at least NACE (Europe)).

At the GA there were questions to the Russian delegate about the next EuroCorr which is to be held in September 2010 in Moscow. Apparently anyone wishing to attend will need a visa and this will entail a visit to a Russian embassy. But all embassies will be issued with instructions that presentation of an invitation to Eurocorr should guarantee a visa. Apart from the GA your correspondent also attended, as the UK delegate, the EFC Coatings Working party. (Note that since the last Eurocorr there is now an active Institute of Corrosion Coatings work group within CED (see my TT article for more details). It would make sense for this group to liaise closely with the EFC coatings working party and this applies to other CED groupings as well).

Social events included a welcome reception on the Sunday evening, the opening of the exhibition on the Monday night and a poster session on the Tuesday. On the Wednesday evening there was a conference dinner held at Chez Simon a restaurant in the hills above the town. This was an enjoyable affair with an entertaining speech by the President where he encouraged all participants to go for swim in the sea after the dinner (This correspondent is quite glad he did not take this offer up as he found out subsequently that the beach at Nice shelves steeply and has some of the largest and sharpest pebbles and stones of any beach in the world- sea is “nice” though once you are “in”).

The technical part of the conference opened on the Monday morning in the main lecture theatre with a welcome from Philippe Marcus. He then gave a short tribute to Erika Kalman. This was followed by the presentation of the Kurt Schwabe prize, awarded to a young (under 35) scientist, to Laure Martinelli. The European Corrosion Medal was given to Professor Vladimir Cihal from SVUOM Ltd, Prague. He gave a lecture on “The role of titanium in stainless steels”, during which data was showing the influence of carbon, chromium, nickel and molybdenum content on intergranular corrosion.

Neil McMurray - Use of SKP

He also emphasised the usefulness of electrochemical polarisation (“Evans”) diagrams as indicators of the resistance to reactivation. This was followed by a plenary lecture by Professor Christofer Leygraf from the Royal Institute of Technology, Stockholm, Sweden entitled “Metal-environment reactions along two opposite directions”. This commenced by outlining the three experimental approaches to atmospheric corrosion viz: field exposures, lab exposures (with in-situ analysis) and exposures in ultra high vacuum conditions. The model system chosen as representative of atmospheric corrosion was zinc in carboxylic acids. He also emphasised that Corrosion and Run-Off are different processes that occur at different rates: the latter can lead to possible damage to the environment e.g. causing aquatic toxicity, the former loss of structural integrity. He also pointed out that nano-sized particulate matter is often a product of atmospheric corrosion and its effects on human physiology were largely unknown. This seems an interesting and important idea. Although there were no further plenary lectures at this conference many of the sessions included 40 minute keynote lectures. Apart from that there were the usual sessions run by EFC Working Parties and several joint sessions.

There were also a number of special workshops viz: Corrosion of archaeological and heritage artefacts: Sea water fouling control; coatings-biocides -treatments); Simulation, modelling and life prediction; recent advances in surface analytical techniques; Cathodic protection of steel in concrete by galvanic anodes; Biotribocorrosion and Corrosion issues in future high temperature nuclear systems. The papers from all these sessions appear on the ROM available from Dechema.

So overall this was, as Edinburgh had been, a very good conference. I am sure the organisers would hope to see as many of you as possible next year in the fascinating surroundings of Moscow!
As regular readers of this column will know I am involved with Corrosion Engineering Division, CED (fairly near the bottom of the pile in terms of the organisation but I like to think I punch above my weight!). The way it works is that Nick Smart is the Chair (Nick. smart@serco.com), then there are the working group chairs (eg Brenda Peters for Coatings), then there are task force leaders (eg within coatings Ian Stewart and Jeremy Twigg), then there is myself as CED coordinator. Actually I have a dual role as I have had my arm twisted to also be the Coatings group’s secretary. After a long confinement we are no very close to giving birth to the first document which is entitled “Guidance note on the selection, specification and use of intumescent coating systems for corrosion protection and fire protection of structural steel”.

Staying with CED, apart from some unofficial activity of the coatings work group nothing much happened at Correx. However a major CED meeting is now being planned for next Spring. It is expected that this will take place at Birchwood Park, Warrington area on around Thursday 29th April 2010.

So please if you have not already done so DO GET INVOLVED IN CED – e.g. by signing up for one or more work groups (you can do this on the web site (www.icorr.org then go to CED section). Apart from coatings there are active work groups in Steel in Concrete, Cathodic Protection, Oilfield Chemical and Corrosion, Monitoring, Nuclear and Water Treatment. Or you can start up your own! (with a few friends - they do not even have to be ICorr members). Contact Nick!

Now I mentioned in the last issue that TT No 21 had stimulated interest: both topics that I covered namely Accelerated Low Water Corrosion and the zinc coated wire. But it is the barbed wire that I want to discuss again here. You may remember the photo showed loss of zinc on the barbs whereas it remained in the other sections. A good term to describe this (used by Eric Martin- see below) is selective corrosion.

You may remember my explanation was extra stress in the barbs. Well some correspondents have offered other explanations. Nick Smart suggested that water stays on those sharp bars for a longer period which lead to faster corrosion near the barbs. Hans Arup has really gone to town with an explanation related to a different forming process of the barbs.

I will include what he said pretty much verbatim, “It is quite possible that different qualities of "Galvanized Wire" have been used. In the galvanizing plant you can finish the process in two different ways. At the exit of the molten zinc bath the wire has a thin alloy layer next to the steel, and a much thicker layer of still molten zinc. This can be blown away by a jet of hot steam or air, leaving only the thin, brittle alloy coating.

barbs longer than other places. Hence overall it is a more aggressive environment. But Hans Arup has really gone to town with an explanation related to a different forming process of the barbs.

Or you can allow the layer of still liquid zinc to solidify while the wire is led vertically several meters through a sort of cooling chimney. I would guess that the thinner and more uniform coating of the “blown” wire is more suitable (convenient) for the processes that the wire must undergo in forming the “barbs” (or whatever they should be called), and the more durable, slowly cooled wire can with advantage be used for the longitudinal wires”.

Thanks to Hans! Inspired by the same article Eric Martin has sent in a spectacular example of selective corrosion of steel (see photos). These were taken in Broughty Ferry in May 2008 ( a place I know - my grandmother was born and brought up in Newport-on-Tay and my mother lived as a teenager in Dundee).

Quoting now from Eric “These are of the cycle racks, which appear uncoated, having only the original millscale. The corrosion appears to be worse at the bends and on the seaward side of the racks. (The quayside can be seen at the top right corner of photo)”. So stress has probably contributed to greater attack. But not on all bends - so part of the explanation appears is in line with Nick’s for the barbed wire ie differing environment.

Anyway the picture is definitely a good one for a Vulture lecture! So thanks for that contribution. Also thanks to others who have written in. One such is Rick Simpson. Although he didn’t actually proffer an alternative explanation for the barbed wire corrosion (perhaps he agreed with me!), he writes very authoritatively on zinc. As an example he gives a goodish explanation for why zinc is ok as a coating for rebar when an instinctive reaction might be that it would not be because zinc is an amphoteric metal (apparently the pH that the solution in the concrete pores gets to is generally below the critical pH). Anyway further examples of selective corrosion from my readers would be welcome! As usual the e-mail address is: Douglas@harrbridge.freeserve.co.uk

P.S. Thanks are due to Eric Martin for permission to publish his two photos.
London Branch Golf Day prize presentations

At the London Branch meeting in October, the prizes were presented by Mike Moffat to the winners of the Golf Day held in June at Silvermere. The Len Townswend Trophy, and the Denso Cup were won by the team from Coastal Preservation Services. The ICorr Shield was won by Doornbos Equipment, and Steve Buxton – a member of that team – was presented with the Ameron Tray.

The Coastal Preservation Services team receive the Denso Cup and the Len Townswend Trophy from Mike Moffat.

Steve Buxton of the Doornbos Equipment team being presented with the Ameron Tray and ICorr Shield by Mike Moffat.

London Branch meeting

At the London Branch meeting in November, Matthew Fletcher of International Paint Ltd. gave a very interesting and well illustrated presentation on the in-situ re-furbishment of tank linings. The use of polycyclamine close-linked epoxy resin coatings offer a good water barrier and have a low level of VOCs. With a speedy curing time, costly plant shut-downs are kept to a minimum and the product has had a very good performance record on the United States.

Matthew Fletcher of International Paint Ltd.
SYMPOSIUM REPORT - YORKSHIRE BRANCH ‘BACK TO BASICS EVENT’, 11/11/09

By Oliver Lewis

Around 30 delegates attended a Yorkshire Branch one-day seminar at the Cedar Court Hotel, Bradford, on the 11th November. The event was titled ‘Back to Basics - The Essentials of Protecting Structural Steel by Protective Coatings and Paints’ and aimed to provide an introduction to the topic for non-specialists, primarily from industry. Sponsorship of the event was also provided by the Yorkshire Regional Development Agency, Yorkshire Forward. The day began with a series of presentations by invited speakers and finished with a lively open discussion presided over by Dave Griffiths, Roger Hudson and Yorkshire Branch Chairman Dave Greenfield. Delegates were also able to view table-top displays from Specialised Coatings and Denso. The proceedings were punctuated by an excellent hot lunch provided by the hotel.

The programme began with a keynote address by Roger Hudson, formerly a corrosion specialist at Corus. Roge began by emphasizing the potential economic benefits of corrosion prevention but argued that this message is still frequently being ignored, 38 years after the publication of the Hoar report on the cost of corrosion. He then continued with a comprehensive discussion of the problems which can arise from the design stage, through material and coating specification, preparation and application of the coating system and long-term maintenance. The presentation was extensively illustrated with pictures and case studies which Roger has collected throughout his career.

Brendan Fitzsimon from Pyeroy Ltd then spoke on the subject of project management, beginning with a description of the ‘perfect’ project manager, before discussing the realities of project management in the coatings sector. Brendan explained how good project management permeates all aspects of any undertaking, including preparing a specification, cost control, time management, training, equipment requirements and health and safety. His presentation finished with a cautionary description of the ‘psychopathic’ coating inspector who, according to Brendan, has invariably been there/done that, knows everything, tells you how it should have been done after it has gone wrong, etc. Judging by the murmured responses from some delegates, such characters are not a myth!

The final speaker before lunch was Steve Davies from Rema Tip Top who gave a presentation on surface preparation and coating application. Steve provided an overview of the standards applicable to surface preparation, with a comprehensive discourse on the requirements of BS EN 14879. This six-part standard provides guidelines on aspects such as permissible design features, substrate imperfections and weld imperfections. Steve then went on to discuss some of the issues surrounding abrasive blast cleaning and the additional need to test for (and remove) non-visible impurities such as soluble salts, organics and acids.

Following the lunch break, Dave Griffiths from Griffiths Associates spoke about quality control. He quoted ‘Old Nick’s Law’ which suggests that the causes of coating system failure can be attributed to surface preparation, application efficiency and material selection, giving each of these factors ‘weightings’ of 65%, 25% and 10%, respectively. To this list Dave also added in-service failures caused by design shortcomings, poor specification, misuse and lack of maintenance. He placed particular emphasis on the need for a good specification as a starting point for a successful project but thought that the instance of poor specifications was increasing. He quoted numerous examples of how a poorly worded specifications can lead to confusion and, ultimately, premature failure of the coating system. These included using the term ‘average coating thickness’ without considering variations in the coating thickness caused by surface roughness. He followed this by explaining how a magnetic coating thickness gauge can give different reading depending on the calibration technique used.

Recurring themes throughout the day were the need to minimize corrosion problems by careful design and manufacture of components or products and the importance of preparing well-written specifications for coating projects. Comments from both speakers and delegates suggested that the latter is of particular concern. It is apparent that a ‘Back to Basics’ approach to educating designers, specifiers and contractors is required if the economic impact of corrosion is to be reduced.
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CLOSE INTERVAL SURVEYS

NACE Corrosion Specialist

OVERVIEW OF CLOSE INTERVAL SURVEY METHODOLOGIES

It is generally agreed that there are four generic types of system commercially available for non-intrusive inspection of pipeline coatings. These are AC voltage gradient (Pearson), AC attenuation (C-Scan and PCM), DC voltage gradient (DCVG) and Close-Interval Polarised Potential Survey (CIPS).

The correct selection and use of one or more of these systems is essential in ensuring that the survey results provide the information desired by the originator of the survey. Many of the techniques are operator sensitive and an experienced operator can obtain detailed information on the condition of coating and cathodic protection systems, using a combination of inspection tools.

The selection of the survey technique for use in a particular application will depend, inter alia, on the following:

a. Anticipated conditions of the coating. For a coating containing only a small number of isolated defects, the survey can be rapidly performed using the AC attenuation technique. This advantage is lost when the coating contains a large number of defects.

b. Type of coating. For systems relying on injection of signals onto the pipeline, thin or conductive coatings will reduce the length of pipe which can be surveyed. DC techniques are not so susceptible to coating thickness.

c. Extent of cross bonding, grounding and similar connections to the pipeline. Connections to the pipe will be identified as defects when a line is surveyed using AC attenuation techniques. The length of line which can be surveyed by any of the other techniques involving injection of signals onto the line will also be reduced by the presence of bonds.

d. Access available to the route of the pipeline. DCVG, CIPS and Pearson surveys require access to be available to the entire length of line. Defects can only be sized (DCVG) if access is also available to land adjacent to the pipeline.

e. Conductivity of the cover over the pipeline. The non-contact AC attenuation technique is not affected by the conductivity of the soil. All the other techniques require electrical contact to be made with the ground, although some systems can be used over metalled roads of relatively high resistivity.

f. Susceptibility to stray current and other sources of interference. Pearson surveys DCVG and CIPS are particularly susceptible to interference. CIPS can be combined with synchronised static stray current recordings to compensate for stray currents. The sizing of defects using DCVG can be unreliable in stray current environments.

g. Length of the pipeline. Techniques such as AC attenuation, which do not involve walking the full length of a pipeline provide an advantage. This advantage is less significant for short lines eg. for lines of less than 10km.

h. Number and size of metallic structures, including fences, foreign lines and grounding systems, close to the pipe route. The Pearson technique is susceptible to false indications under these conditions.

i. Operating condition of existing cathodic protection systems. An effective cathodic protection system (or a temporary cathodic protection grounded) is necessary for the performance of a CIPS survey.

Details of the various survey techniques may be found in the literature and readers are referred to these texts for further information. The main points pertaining to these survey techniques, together with some of their benefits and limitations, are summarised below:

1. Pearson Survey (ACvG)

The Pearson survey operates by imposing an AC signal on the pipe and measuring the strength of the resulting signal generated in the ground. The signal is applied to the pipe at a convenient connection point, such as a cathodic protection test station. In this technique the signal is detected through spiked boots worn by two operators walking a predetermined distance apart, and the equipment is carried by the leading operator.

The resultant ground signal is produced by AC leakage from the coated pipeline, occurring, for example, at defects. The detected AC signal will therefore depend on the size of the defect in the coating.

Defect sizing is qualitative and dependant on the skill and experience of the operator. Defect location is precise. The technique...
suffers from AC interference and cannot be used reliably under powerlines. The range of the survey is limited due to natural attenuation. The Pearson survey does not provide any information on the performance of any cathodic protection systems which may be influencing the surveyed pipe.

2. AC Attenuation

Operating similarly to the Pearson survey, during an AC Attenuation survey (also known as C-Scan and PCM) an AC signal is applied between the coated pipeline and a grounding system. Cathodic protection test stations provide suitable locations for injection of the signal onto the pipeline. The signal is transmitted along the pipe with losses occurring predominantly at defects.

Two types of system for detection of AC attenuation are commercially available. One is a non-contact method, based on detection of the signal radiated from the pipe. Field coils or magnetometers are used to detect the radiated signal. The other type of system detects the AC potential on the pipe using a conventional reference electrode and suitable high speed logging equipment.

Current Attenuation surveys produce an average coating assessment over a relatively long section of pipe, not precise coating defect location. This is excellent in prioritising subsequent survey and rehabilitation work but not in assessing local corrosion control performance. It should also be noted that the AC attenuation does not provide any information on the performance of any cathodic protection systems which may be influencing the surveyed pipe.

3. Direct-Current-Voltage-Gradient (DCVG)

The purpose of the DCVG survey is to locate wrapping defects and other coating anomalies on the pipeline. On a new pipeline, these defects indicate regions of coating damage which occurred pre- or during installation.

The DCVG survey technique involves the injection of a pulsed DC signal onto the pipeline, and the detection of the resulting potential gradient developed in the soil. Key features of the DCVG survey are as follows:

- the excitation signal is a pulsed DC signal rather than an AC signal, such as is used in the Pearson survey.
- contact with the soil is made using a pair of stable reference electrodes, rather than the spiked boots used during a Pearson survey.

 Principally, the DCVG survey is conducted in the following way. A pulsed potential is applied to the pipe at a convenient location, such as at a cathodic protection test station. The signal is typically 500mV at a frequency of 1 Hz. The operator surveys the line by walking along it with a pair of reference electrodes, placing each electrode in contact with the soil for a short time. Readings are taken when both reference electrodes are simultaneously in contact with the ground.

When the pipeline is well coated, there will be no current flowing through the soil. Both the electrodes will, therefore, be at the same potential and the high impedance volt meter, connected to the two electrodes, will not detect any component of the pulsed potential applied to the line.

Any defects in the pipe coating will cause the pulsed DC signal to flow through the soil, to the defect site. This current will have a longitudinal component which will produce a signal which will be greatest, local to the defect. The precise location of the defect can be identified by finding the location where the potential is a minimum. Potential gradients are measured longitudinally and transverse to the pipeline, to allow the location of the defect epicentre to be established.

The survey accurately locates defects and can provide a semi-quantitative measure of defect size. The accuracy of sizing is affected by DC stray currents, and no permanent record of the survey is obtained other than by operator diligence. No indication as to CP operational status is obtained other than at test posts.

It is possible to enhance the DCVG survey accuracy in terms of defect significance and under stray current conditions by using a trailing cable to accurately determine the potential shift local to the defect and at the same time as the transverse gradient.

4. Close Interval Polarised Potential Survey (CIPS)

The CIPS technique involves measurement of the polarized potential of the line at distances along it of less than one pipe depth. It was developed to establish the status of cathodic protection systems at every point in the line. Such techniques increase the probability of detecting local phenomena, such as those associated with coating defects.

In a CIPS, it is not the performance of the coating, but the polarized potential of the pipe which is measured. These two aspects of corrosion control are, however, closely linked. Coating damage may occur as a direct result of over protection. Also, areas where coating has been lost will generally be more difficult to cathodically protect than areas of sound coating. In these areas of damaged coating, the pipe will appear more positive with respect to the reference electrode than will adjacent pipe with undamaged coating. These defect areas will also attract higher
For the purposes of contract compliance, a DCVG survey would be most practical, but a Pearson survey could be used.

- To evaluate the status of cathodic protection, a CIPS survey would be preferred.
- To gain a rapid overview of coating condition, or to assess sections where contact methods are impractical, AC attenuation comes to the fore.

Where the survey requirements cannot be met by any one technique, combination techniques are now practical due to the development of better equipment and integrated data logging devices.

The use of GPS signals for positional logging is becoming common, and so far is automated into AC attenuation techniques. GPS related CIPS techniques are under development, but not yet commercially available.

The most successful combined surveys (single team) have been CIPS together with Pearson or DCVG. These surveys use multi-channel data loggers and record both signals simultaneously. The disadvantage of Pearson in this situation is the requirement for a second signal generator. If however, the pipeline is being traced at the same time as the survey is undertaken, this is not a drawback. The first surveys were undertaken nearly 20 years ago.

Combination CIPS and DCVG surveys are a logical development as they can use the same signal on the pipeline. The integration of the DCVG signal with the CIPS data overcomes two of the main drawbacks of conventional DCVG: the permanent record of the DCVG result, and the presumption that the potential shift at the defect is linearly proportional to the shift at the adjacent test points.

A relatively accurate defect sizing technique is available in accordance with international standards, although physical verification and correlation should still be undertaken.

Plates 1 – 5 show various results of combination surveys.

**FURTHER READING**

- **Handbook of Cathodic Corrosion Control**
  W von Baekeman, W Schwenk & W Prinz

- **NACE TM 0109**
  Aboveground Survey Techniques for the Evaluation of Underground Pipeline Coating Condition

- **NACE SP 0207**
  Performing Close-Interval Potential Surveys and DC Surface Potential Gradient Surveys on Buried or Submerged Metallic Pipelines

- **NACE SP 0502**
  Pipeline External Corrosion Direct Assessment Methodology

**SUMMARY OF SURVEY CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Defect Location</th>
<th>Defect Size</th>
<th>CP system info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson (ACVG)</td>
<td>Yes</td>
<td>Subjective</td>
<td>No</td>
</tr>
<tr>
<td>AC Attenuation</td>
<td>Not specific</td>
<td>General coating cond</td>
<td>No</td>
</tr>
<tr>
<td>DCVG</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>CIPS</td>
<td>Likely defects</td>
<td>Qualitative</td>
<td>Yes</td>
</tr>
<tr>
<td>Combined CIPS/DCVG</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Plate 1: Combined Close Interval Potential and Recorded DCVG Survey with Defect Size Calculation

Plate 2: Combined Close Interval Potential and Recorded DCVG Survey with Stray Current Compensation
Plate 3: Combined Recorded DCVG Survey, Close Interval Potential Survey and Stray Current Monitoring with Constant potential Rectifier. Note scale of Interference Potentials.

Plate 4: Combined Close Interval Potential and Recorded DCVG Survey with Combined Impressed Current and Sacrificial Anode CP System. Note Characteristic Signature of Anode “Defects”
Plate 5: Combined Close Interval Potential and Pearson Survey

Plate 6: Typical Non-Critical Defect Located and Characterised with Combined Close Interval Potential and Recorded DCVG Survey
METAL SPRAY GUARD PROTECTS AGAINST DANGEROUS SPRAY-OUTS

A new type of TUV approved stainless steel spray guard which provides effective protection from dangerous spray-outs of fuel oils such as kerosene, diesel and other flammable liquids from pipes and flanges, has recently been introduced by level and flow specialists ALLISON ENGINEERING.

The innovative design of the Allison safety shield incorporates a steel band and an internal stainless steel mesh which wraps around flanges and valves. This mesh is designed to sit against the flange, between it and an outer steel band and compresses against it to ensure that sprays or leaks are dispersed, whilst also preventing lateral spray. The mesh acts as a seal which is ‘pinched’ in the middle to form a raised layer that squeezes in the small gap between the two flange faces.

The shield, which is TUV approved and has been pressure tested up to 50 bar, has a quick-release connection, it does not require tools or any knots to be tied, so installation and removal is quick and simple. It provides effective spray control on most flange configurations, round, oval or square and regardless of the flange gap, the internal stainless mesh adapts accordingly.

Further details on Allison Spray Control Guards is available from:
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Tel: 01268 526161. Fax: 01268 533144.
generalsales@allisonco.uk
www.allison.co.uk

Knowlton and Newman Launched as Belzona Authorized Coating Centre

On Wednesday 21st October 2009, Belzona, a design and manufacturer of industrial protective coatings and polymer repair composites, celebrated the launch of a new Authorized Coating Centre, Knowlton and Newman, at one of their three branches located in Southampton.

Achieving the Authorized Coating Centre Status now means that Knowlton and Newman 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.

Mike Knowlton, one of the five Directors for Knowlton and Newman commented about the day, ‘I am extremely pleased as it has been a really successful day, I don’t think there will be one person who will go away without learning something new which will add value to both of our businesses.’

Daniel Knowlton, one of the other Directors further commented, ‘I thought that overall the day was a great success and credit is due to all involved. I really look forward to a bright future for the Belzona- Knowlton and Newman joint effort.’

Belzona introduced the Authorized Coating Centre 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” which include Petrochemical, Power, Paper and Water/Wastewater.”

Belzona is represented by a single Authorized Coating Centre for each UK region and BACC status has already been granted to four companies in Glasgow, Teesside, Manchester and now Southampton. Belzona are now looking to recruit a final Coating Centre to be based in the Midlands which will complete the network. To receive recognized status, service centre’s must demonstrate high performance equipment and facilities, a dedicated coating room with a temperature controlled area and invest heavily in Surface Preparation equipment whilst also maintaining high levels of application procedures and after sales support.

Knowlton and Newman have been providing industry since 1973 with a wide range of mechanical services to minimize downtime for customers and drive down costs, operating from three branches, Southampton, Portsmouth and Chatham.
COMPANY NEWS

Archco-Rigidon Protects British Sugar Screw Conveyor

Winn & Coales Archco-Rigidon corrosion resistant and anti-abrasion linings have been used to protect a conveyor system for British Sugar.

Designed and manufactured by George Robson of Sheffield, the Archimedes type screw conveyor mechanism feeds sugar beet slurry from wet pumps to press stations at British Sugar’s Wissington plant, near King’s Lynn.

The Archco-Rigidon 423D and 523 coatings used are based on glass flake vinyl ester. They were applied for George Robson by Broadblast of Sheffield, who first shotblasted the surfaces to ensure good mechanical key for the Archco-Rigidon coatings.

New Packaging Colours for Denso Paste Tubs

Specialist anti-corrosion and sealing product manufacturer Winn & Coales (Denso) Ltd, are pleased to announce that they have extended recent packaging changes to their petrolatum ‘paste’ products as part of a corporate design upgrade.

The Denso Paste labels, previously printed in black and white on a red background, are now reproduced in blue and white to match the new corporate colour scheme for Denso products.

This announcement is made as part of the company’s policy for the continual improvement of their product range and to inform their customers all over the world that when they receive the new style packaging, they can rest assured that the products inside are still the same genuine, high quality Denson products they have always been.

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E-mail: mail@denso.net Website: www.denso.net
BAC Corrosion Control Limited, the UK subsidiary of a Swedish multinational and a leader in the field of cathodic protection and electrical pin brazing has the following job opportunities.

**Cathodic Protection (CP) Staff Positions**

Due to expansion, a number of vacancies are currently available for suitably qualified CP personnel comprising:

- **CP Project Engineer (Overseas based)**
- **CP Project Engineer (Overseas based)**
- **CP Project Engineer (Head Office based)**
- **CP Field Technicians (Head Office based)**

Job descriptions for each are available upon written request.

Written applications only are invited addressed to the Managing Director and accompanied by an up to date Curriculum Vitae.

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For further information visit www.bacgroup.com
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</tbody>
</table>

![Visit the new ICorr website](www.icorr.org)
DIARY DATES 2009/10

21st January 2010
Midland Regional Branch – Inaugural Meeting
Venue: Holiday Inn Express – Walsall: Just off M6 at Junction 10
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For further details contact Brian Wyatt,
Email: brianwyatt@controlcorrosion.co.uk
For further details contact Brian Wyatt,
Email: brianwyatt@controlcorrosion.co.uk

26th January 2010
Life Extension of Existing Assets from a Cathodic Protection Perspective
For further details contact George Frank,
Tel: 01224 870 100  Email: george.frank@cangroup.net

23rd February 2010
Material & Chemical Selection & Ongoing Corrosion Management Issues for Bundled Pipeline Systems
For further details contact George Frank,
Tel: 01224 870 100  Email: george.frank@cangroup.net

13th April 2010
Fabrication and Installation of a Multi-Platform Impressed Current Cathodic Protection System, an Operator’s View
For further details contact George Frank,
Tel: 01224 870 100  Email: george.frank@cangroup.net

4th December 2011
Fray International Symposium
Venue: Hilton Cancun, Golf and Spa Resort, Cancun, Mexico
For further details contact Dr. Florian Kongoli,
Email: fkongoli@flogen.com

SHORT COURSES
9th-12th November
Corrosion Control in the Oil and Gas Industry
Amsterdam: Further details contact Colin Britton,
Tel: +44 (0)1480-860943 Email: cbrit79727@aol.com
or website at www.cfpa.com

visit the new ICorr website
www.icorr.org

Details of all Branch activities, dates and venues can be found at www.icorr.org

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