

Corrosion and Prevention 2005

**Queensland, Australia
20-23 November 2005**

ISBN: 978-1-62276-241-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2005) by the Australasian Corrosion Association
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the Australasian Corrosion Association
at the address below.

Australasian Corrosion Association
P.O. Box 112 Kerrimuir
Victoria 3129 Australia

Phone: 61 3 9890 4833
Fax: 61 3 9890 7866

aca@corrosion.com.au

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

A Forgotten Method of Determining Ground Bed Resistance	1
<i>P. Clark</i>	
A Rotating Parallel Disc Device for Corrosion Studies	5
<i>A. Deev, J. N. Connor, R. Clegg, G. Hoare, D. Druskovich</i>	
An Evaluation of Steels Subjected to Rock Bolt SCC Conditions	12
<i>E. Villalba, J. Mougin, A. Atrens</i>	
An Experimental Study of the Kinetics of the Tetragonal to Monoclinic Phase Transformation Occurring During the Low Temperature Environmental Degradation of Zirconia Ceramics	22
<i>Z. Zhao, C. Liu, D. O. Northwood</i>	
An Overview of U.S. and European Specifications and Related Documents for Electrochemical Treatments of Reinforced Concrete	33
<i>J. P. Broomfield</i>	
Assessment of the Risk of Using a Cathodic Protection System on Alkali-Silica Reactive Concrete Elements	39
<i>A. Carse, P. Dux</i>	
Atmospheric Corrosion Rates of Aircraft Structural Aluminium Alloys – Controlling Factors and Mechanisms	50
<i>B. Hinton, A. Wythe, E. Duxbury, A. Trueman, S. Russo, A. Butler, S. Knight, S. Grummet</i>	
Australasian Corrosion Association – Who Needs It?	58
<i>W. Day</i>	
Best Practice Pressure System Integrity Management Through Risk Based Inspection Audits Or How Valid is Your Risk Based Inspection System	60
<i>J. Fletcher, Darren Chrzanowski</i>	
Case Studies of Condition Assessment Outcomes on Major Trunk Water Mains	66
<i>D. Nicholas, M. Dafter</i>	
Cathodic Protection of Horizontal Directional Drilled Shore Crossings.....	79
<i>M. Davidson</i>	
Cathodic Protection of the Swan Island Bridge Queenscliff Victoria	87
<i>I. Godson, P. Cameron, A. Brunacci</i>	
Challenges in Field-Trial Corrosion Measurement	97
<i>J. N. Connor, David Druskovich</i>	
Chemical Cleaning of Petroleum Refinery Process Equipment.....	104
<i>Mark S. Schilling</i>	
Coating Systems for Steel & Concrete Bridges	105
<i>Ern Hemmings</i>	
Coiled Galvanic Corrosion Sensors for Atmospheric Corrosion Monitoring.....	115
<i>W. D. Ganther, T. Muster</i>	
Concrete Behaviour Under Pulse and Conventional Cathodic Protection Current.....	126
<i>D. A. Koleva, J. Hu, A. L. A. Fraaij, K. Van Beek</i>	
Concrete Durability in Wastewater Reticulation and Treatment Facilities and Its Sensitivity to Small Changes in Exposure Conditions.....	138
<i>S. M. Bruce, S. A. Freitag</i>	
Condition Assessment Techniques for Pressure Water Mains	149
<i>P. Ferguson, S. Farrelly, D. Nicholas</i>	
Corrosion and Refurbishment of Crude Oil Storage Tank Floors	157
<i>M. Brown</i>	
Corrosion Behaviour of Laser Surface Treated Magnesium Alloy, AZ91 in Chloride Environment	168
<i>R. K. Singh Raman, S. Murray, M. Brandt</i>	
Corrosion Field Trials – Case Studies of Unsuccessful Atmospheric and Marine Immersion Studies.....	176
<i>R. Jeffrey, R. E. Melchers</i>	
Corrosion Investigations of Ran Minehunters	184
<i>P. Mart, B. Moore, B. Martin, T. Christopoulos, N. Gage</i>	
Corrosion Management in Gold Coast Water a Key Issue in the Journey to Strategic Asset Management.....	196
<i>Richard Hughes</i>	

Corrosion of Mild Steel HDG Steel and 316 Stainless Steel in CCA CuAz and ACQ Treated Pinus Radiata	200
<i>G. Kear, M. S. Jones, P. W. Haberecht</i>	
Corrosion Performance of Organic Coatings on Coated Substrates	212
<i>R. Edavan, A. Ruggieri, R. Kopinski</i>	
Corrosion Rates in a Fertilizer Plant and the Structural Failure of a Conveyor Gantry	231
<i>B. J. Dockril, R. Jeffrey</i>	
Crevice Corrosion of SAF2906 Super Duplex Steel in Umbilical Applications	242
<i>C. J. Moss, M. Tiffin</i>	
Dehumidification Use in Surface Preparation and Coating Vs Weather Related Coating Failures	258
<i>D. Dawson</i>	
Design of Impressed Current Discrete Anode Systems for Concrete Structures: Theory and Practice	266
<i>M. Cope, P. Clark</i>	
Determination of Stress Corrosion Cracking (SCC) Susceptibility (KISCC) at Imposed Potentials Using a Novel Circumferential Notch Tensile (CNT) Technique	273
<i>R. Rihan, R. K. Singh Raman, R. N. Ibrahim</i>	
Developments in Innovative Cathodic Protection Systems	280
<i>J. P. Broomfield</i>	
Does the Hydrocarbon Process Industry Benefit from Advanced Paint Technology? Do Professional Associations Contribute?	294
<i>J. S. Evensen</i>	
Effect of Nitrate in Polarisation and Pitting Behaviour of Stainless Steels 316L and SAF 2507 and Incoloy 825 in Chloride Solutions	302
<i>W. H. Siew, R. K. Singh Raman, B. C. Muddle, N. Cann</i>	
Electrochemical Study of the Galvanic Corrosion of Marine Metals and Alloys	309
<i>T. Trueman, B. Moore, T. Donnan, P. Mart</i>	
Experience with the Introduction of Intelligent Pigging in Small Diameter Pipelines	320
<i>D. G. Rice</i>	
Extending Inspection Intervals for Pressure Vessels	326
<i>P. Hancock, P. Wilson</i>	
FPSO Corrosion Protection	332
<i>M. Davidson, A. Garner</i>	
Galvanized Coatings on Power Equipment: Optimizing Life Cycle Costs	340
<i>M. Boardman, W. Marshall</i>	
Galvanized Passivation and Zinc Surface Treatment Effects on Corrosion Rates	348
<i>D. Fullston</i>	
Improvements in Lab Corrosion Testing Cabinets	355
<i>H. D. Hilton, J. Moffatt</i>	
Investigations of Corrosion on Military Aircraft	360
<i>P. Trathen</i>	
Junk Science in Corrosion Control: Gimmicks Gadgets and Gizmos	368
<i>Mark S. Schilling</i>	
Lead Paint Removal and Recoating of Historic Bridge	401
<i>R. A. Francis</i>	
Let Us Now Praise Famous Men	408
<i>D. Bartlett</i>	
Mechanisms of Protective FeCO₃ Film Removal in Single-phase Flow-accelerated CO₂ Corrosion of Mild Steel	416
<i>V. Ruzic, M. Veidt, S. Nesic</i>	
Merits and Myths: Galvanized & Painted Protective Coatings for Steel	428
<i>E. Pimentel, D. Bartlett, G. Thomson</i>	
Metal Dusting and Its Prevention	438
<i>J. Zhang, D. J. Young</i>	
Microbiological Contributions to Accelerated Low Water Corrosion (ALWC) of Steel-piled Structures: A Review	448
<i>R. Javaherdashti</i>	
Moisture Cure Urethane (MCU) PNG Gold Mine Case Study	454
<i>B. Eldridge</i>	
Performance of Stainless Steel to Repair Or Prevent Corrosion Damage in Concrete	460
<i>A. Shayan, A. Xu</i>	
PF Thompson Memorial Lecture: Cathodic Protection – Black Box Technology?	474
<i>B. Ackland</i>	

Predictive Modeling of the Internal Corrosion of Sweet and Sour Multiphase Pipelines.....	483
<i>K. Sand, C. Deng, P. Teevens</i>	
Relevance of Prior Electrochemical Conditioning in Polarisation Behaviour and Caustic Cracking of Mild Steel.....	495
<i>A. Saxena, R. K. Singh Raman</i>	
Reliability and Control of Ultrasonic Thickness Testing.....	507
<i>K. Arcus</i>	
Setting New Standards	519
<i>T. Davison</i>	
Sir Humphry Davy and Michael Faraday - The Original Corrosion and Cathodic Protection Pioneers	530
<i>R. A. Gummow</i>	
Some Practical Considerations Relevant to the Recording of Corrosion Data.....	541
<i>D. P. Schweinsberg, H. J. Flitt</i>	
Sour Pipeline Production Operations: 27 Years of Failure-free Engineering Strategies for the Detection, Mitigation and Prevention of Internal Pipeline Corrosion.....	554
<i>P. Teevens</i>	
Strategy for Monitoring the Long Term Corrosion Performance of Queensland Main Roads Concrete Infrastructure	567
<i>A. Carse, A. Cheaitani</i>	
The Corrosion Performance of Metallic Coatings on Wire Products Exposed to Atmospheric Marine Environments	576
<i>R. Fabien, M. Robertson, G. Walter</i>	
The Probability of Occurrence for Pits of Maximum Depth - Upsetting 50 Years of Convention.....	585
<i>R. E. Melchers</i>	
The Use of Calcium Aluminate Cement for Corrosion Control in a Sewer Pumping Main.....	593
<i>D. Egan, A. Fletcher, G. Moore, M. Teicher</i>	
Thin-film Sensors for Atmospheric Corrosion and Structure Monitoring	601
<i>T. H. Muster, B. A. Sexton, F. Smith, R. O'Halloran, T. Davis</i>	
Transgranular SCC of Magnesium	613
<i>N. Winzer, G. Song, A. Atrens, W. Dietzel, C. Blawert</i>	
Validity of Carbon Dioxide Corrosion Rates Determined by Linear Polarisation at Low Potential Scan Rates	625
<i>D. John, S. Bailey, R. De Marco, Brian Kinsella</i>	
Author Index	