



Seminar on Galvanic Corrosion and Cathodic Protection 2019

Date: 29 November 2019 (Fri)

Time: 9.00am – 5.15pm

Venue: Level 4, Jubilee Room

Four Points by Sheraton Singapore, Riverview
(382 Havelock Road, Singapore 169629)

Fees (inclusive of GST)

IES Members: \$299.60

IES RE/RTO, CIJC and *affiliated members**: \$342.40

Non-Members: \$385.20

Enjoy 10% off for group registrations of 5 or more participants!

***Affiliated members refer to members of the following organisations:**

Corrosion Association Singapore (CAS), Institute of Marine Engineering, Science & Technology (IMarEST), Royal Institute of Naval Architects (RINA)

Eligible CPD

6 PDU (PE, IES CEng)

6 STU (M&E)

6 STU (Struct)

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PROGRAMME

With increasing numbers of building & infrastructural as well as industrial assets located in close proximity to, and even within aqueous or marine environments, protection of materials of construction, particularly steel and other metals, against corrosion is of great importance.

The seminar will address the developments in the understanding of galvanic corrosion, and the various methods and procedures necessary for achieving corrosion protection, with particular emphasis on cathodic protection.

Time	Topic	Speaker
0830	Registration	
0900	Welcome Address	Dr Chandra Segaran , Chairman, IES Publications Committee
0905	Fundamentals of Electrochemical Corrosion and its impact on Galvanic Corrosion	Assoc Prof Daniel John Blackwood , Deputy Head, Department of Materials Science and Engineering, NUS
0940	An Introduction to Cathodic Corrosion Protection	Mr Asokan P Pillai , Principal Consulting Engineer, Pipeline Integrity Consulting Engineers Pte Ltd
1015	Tea Break	
1045	Importance of proper knowledge and practices to fight against corrosion	Dr Sudesh L Wijesinghe , Scientist, A*STAR SIMTech, and Adjunct Associate Professor, Department of Materials Science and Engineering, NUS
1120	New technologies to enable inspection of difficult-to-reach and hard-to-shutdown assets such as tanks and pipelines	Mr Keith Kee , President, Corrosion Association Singapore
1155	Q&A Session 1	
1230	Lunch	
1345	Cathodic Protection Design Parameters and Computations	Mr Asokan P Pillai , Principal Consulting Engineer, Pipeline Integrity Consulting Engineers Pte Ltd
1420	Can Vapor phase Corrosion Inhibitors (VpCI) supplement existing Cathodic Protection (CP) systems or provide protection in their absence?	Mr Philip Horsford , Regional Manager, Cortec Southeast Asia
1455	Using Correct and Innovative Tools to Validate Cathodic Protection	Mr Gurmit Singh , Managing Director, ZINGAMETALL (Singapore) Pte Ltd
1530	Tea Break	
1600	Cathodic protection of steel in concrete in compliance with European Standard EN 12696	Mr William Neo , Manager (Specifications & Technical Sales), Mapei Far East Pte Ltd
1635	Q&A Session 2	
1715	End of Seminar	

SYNOPSIS



Assoc Prof Daniel John Blackwood

Deputy Head, Department of Materials Science and Engineering, NUS

Fundamentals of Electrochemical Corrosion and its impact on Galvanic Corrosion

Corrosion involves the anodic oxidation of a metal, typically back to an ore. However, oxidation of the metal is only half of the story, as it has to be balanced by a cathodic reduction process which, in an aqueous environment, is usually the reduction of either dissolved oxygen or water/protons. The anodic and cathodic reactions cannot proceed independently and consequently corrosion rates are explicitly tied to the rates of the cathodic reactions. The second most important factor affecting corrosion rates is a metal's ability to form a protective passive film. This presentation will discuss how the kinetics of the cathodic reactions and the stability of passive films impact corrosion rates of both isolated and galvanically coupled metals.



Mr Asokan P Pillai

Principal Consulting Engineer, Pipeline Integrity Consulting Engineers Pte Ltd

An Introduction to Cathodic Corrosion Protection

This presentation is intended to provide an overview of the principles of, and the typical application of corrosion mitigation via, the cathodic protection technique. It will include the definition, brief history, the basic schematic, the galvanic series and typical applications. A short introduction to other corrosion mitigation methods particularly protective coatings relative to cathodic protection and the types of cathodic protection systems will also be presented. Further, the presentation will highlight the common reference engineering codes and standards, design criteria and the differences between a sacrificial/galvanic system and an impressed current cathodic protection system. Overall, this presentation will provide a basic introduction to cathodic corrosion protection.



Dr Sudesh L Wijesinghe

Scientist, A*STAR SIMTech, and Adjunct Associate Professor, Department of Materials Science and Engineering, NUS

Importance of proper knowledge and practices to fight against corrosion

Corrosion causes deleterious consequences both socially and economically. Can we at least save some cost out of this? The answer is 'Yes', if we use PROPER knowledge and practices! First, it is essential to gain proper knowledge before handling corrosion-related issues and before implementing corrosion protection solutions. After understanding the specific corrosion problem, it is important to then select and assess corrosion protection solutions to cater to that specific problem, which will require proper corrosion assessment capabilities and expertise. Singapore Institute of Manufacturing Technology (SIMTech) offers both proper knowledge and capabilities on corrosion protection, which are essential for Singapore's industrial sectors.

SYNOPSIS



Mr Keith Kee

President, Corrosion
Association Singapore

New technologies to enable inspection of difficult-to-reach and hard-to-shutdown assets such as tanks and pipelines

The industry has a track-record of asset inspections using proven NDT technologies for asset integrity inspection. However, some assets still remain hard or almost impossible to inspect, due to various reasons such as cost of down-time, difficult-to-access equipment or simply the assets cannot be shut down due to operational factors.

There are a number of new innovative anomaly detection technologies based on non-contact and non-invasive methods. These tools are there to help to manage and optimise defects risk detection in associated assets.

During the presentation, various inspection technologies related to large storage tanks, double-walled tanks, pipelines under insulation, corrosion under support structures, buried underground pipelines etc will be discussed.



Mr Asokan P Pillai

Principal Consulting Engineer,
Pipeline Integrity Consulting
Engineers Pte Ltd

Cathodic Protection Design Parameters and Computations

The objective of this presentation is to introduce the basic design parameters to consider in a typical cathodic protection system design computation. The relevance of the various parameters like design life, electrolyte resistivity, the structure's coating efficiency, and anticipated current density, will be highlighted. Next, the common anode characteristics and their typical applications will be reviewed. A typical sacrificial/galvanic cathodic protection system design calculation procedure for a buried pipeline will be demonstrated. The presentation will also include the necessity to consider other critical requirements like electrical isolation, shielding effects, microbial corrosion and stray interference currents, in a typical design project.

SYNOPSIS



Mr Philip Horsford

Regional Manager, Cortec
Southeast Asia

Can Vapor phase Corrosion Inhibitors (VpCI) supplement existing Cathodic Protection (CP) systems or provide protection in their absence?

Protection of above-ground storage tank bottom plates against soil side corrosion is an important concern for any asset owner. Effective corrosion control measures must be taken to ensure bottom plate integrity for continuous, safe, and economical operation of storage tanks. It is well-accepted that cathodic protection alone may not be enough to achieve the required level of protection. Could Vapor phase Corrosion Inhibitors be the answer?

The presentation will discuss field trials, lab data and future trends, exploring the synergistic effects of Vapor phase Corrosion Inhibitors and their interaction with cathodic protection systems.



Mr Gurmit Singh

Managing Director,
ZINGAMETALL (SINGAPORE)
PTE LTD

Using Correct and Innovative Tools to Validate Cathodic Protection

Hot Dipped Galvanizing (HDG) is a known process that allows for zinc to sacrifice itself to protect steel. Over time, when the zinc is depleted, the structure will have to be dismantled and sent to an HDG yard, in order to re-galvanise it, and then it has to be re-assembled - all of which is rather impractical. The alternative is to apply a coating that replicates the cathodic protection offered by HDG, and further be able to repeat the process, thereby protecting the structural integrity of the steel from corrosion. This presentation will provide a basic introduction to some of the tools to validate the cathodic protection offered by coatings.



Mr William Neo

Manager (Specifications &
Technical Sales), Mapei Far East
Pte Ltd

Cathodic protection of steel in concrete in compliance with European Standard EN 12696

Time and environment have a very strong influence on concrete durability, that is, 'the capacity of a structure to withstand the attack of various kinds of aggressive agents, while maintaining the mechanical and functional characteristics of the structure'. There have been numerous attempts to overcome these challenges through change in design, material specification and methods of construction. The objective of the presentation is to share strategies for overcoming these challenges, and it will cover the causes of corrosion and cathodic protection for new and compromised structures.

TERMS & CONDITIONS

Registration

Registration will be on a first-come-first-served basis and will only be confirmed upon receipt of full payment, unless otherwise invoiced. All registrations must be submitted with the completed on-line Registration Form.

Closing Date & Payment

The closing date for registering for the seminar shall be by Tuesday, 26 November 2019. Payment via credit card, PayPal and invoice should be settled at least 3 business days before the event.

Confirmation of Registration

Confirmation of registration will be given 5 business days prior to the seminar via email. We reserve the right to allow only confirmed registrants to attend the event.

Refunds and Cancellations

No refunds will be made for withdrawals. Replacements will be allowed only if written notice is received by us at least 3 business days before the seminar. However, when an IES member is replaced by a non-member, the participant shall pay the difference in the relevant fees at least 3 business days before the seminar.

Course Cancellation/Postponement

Changes in venue, date, time and speakers for the events can occur due to unforeseen circumstances. The organiser reserves the full right to cancel or postpone the event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if the Event is cancelled by the organiser.

Enquiries

For more information, please email: desmond@iesnet.org.sg or jiayu@iesnet.org.sg