Scope of Symposia

Cathodic & Anodic Protection

Issues and challenges associated with the application of cathodic protection systems for protection against corrosion of metallic surfaces of pipelines/structures in contact with soil/water/electrolyte. Specific topics of interest for CP design/engineering, construction, monitoring and maintenance may include development and application of new materials, technologies and techniques, case studies and AC/DC interference detection and mitigation. CP of tanks, bullets and plant piping, as well as CP for cross country pipelines, city gas distribution pipelines, municipal water and sewage pipelines and in-shore and off-shore structures will also be covered.

Chair: Pankaj Panchal

Coatings Linings and Thermal Insulation

Issues and challenges associated with coatings, linings, and thermal insulation for various industries where these are used to protect, insulate, or decorate assets and systems. Specific topics of interest may include coatings and linings for pipelines, offshore steel structures, concrete surfaces, transport vehicles, and power & petrochemical plants. The symposium will also cover inspection and study of coatings, including design and failure analysis, material selection, new developments, implementation, case studies, and the development and application of emerging technologies related to coatings and linings. Thermal insulation topics will cover its role in energy conservation, process efficiency, and corrosion under insulation (CUI) prevention, including material selection, design, performance, and maintenance solutions for industrial applications.

Chair: Denzil D’Costa

Corrosion and Its Mitigation in the Renewable Energy Sector

This topic focuses on corrosion-related challenges in materials, components, and systems employed in renewable energy technologies including wind, solar, hydro, geothermal, biomass, and hydrogen energy. It will cover corrosion and degradation phenomena arising from exposure to harsh environments such as marine atmospheres, high humidity zones, geothermal fluids, and aggressive chemical by-products in biomass and hydrogen systems.

Special attention will be given to the protection of electrical and electronic components critical to system control, energy conversion, and grid integration. This includes corrosion of connectors, sensors, control systems, and power electronics due to moisture ingress, condensation, salt spray, and temperature fluctuations.

Mitigation strategies of interest include advanced coatings and encapsulants, corrosion-resistant materials, hermetic sealing techniques, cathodic protection, corrosion inhibitors, and design improvements for extended service life. Submissions may also cover case studies, monitoring and diagnostics, performance evaluation, and predictive maintenance technologies. Emerging trends such as AI/ML-based corrosion prediction, sustainable corrosion control practices, and material innovations aligned with the clean energy transition are also welcome.

Chair: Dr. Raman Vedarajan

Corrosion in Concrete and Infrastructure

This symposium aims to explore the multifaceted challenges and advancements in addressing corrosion in concrete infrastructure. It will cover the fundamental mechanisms and various types of corrosion affecting reinforced concrete, such as chloride-induced and carbonation-induced corrosion. The event will highlight the latest research in detection and monitoring technologies, including both destructive and non-destructive techniques like half-cell potential mapping, concrete resistivity, ultrasonic testing, ground-penetrating radar, and integration with structural health monitoring systems. Recent advancements in preventive measures—such as novel coatings, corrosion inhibitors, cathodic protection systems, and durable construction materials—will be discussed alongside innovative repair and rehabilitation techniques, including electrochemical treatments, fiber-reinforced polymers, and self-healing composites. Through technical sessions and case studies, the symposium aims to foster knowledge exchange and promote sustainable, long-term strategies for corrosion management in diverse infrastructure systems.

Chair: Prof. Visalakshi Talakokula

Corrosion in Defence Sector

Military assets like warships, submarines, weapons, platforms, arms, ammunition, off-shore installations, bridges, sensors etc. are exposed to very harsh corrosive environment. Corrosion is a huge problem not only for civilian sector but also for the armed forces as the war equipment are deployed in very aggressive environments which causes significant stress on them. The cost of corrosion is huge for our armed forces as we spend nearly 25% of the budget allocated for maintenance on corrosion management alone. If we can address some part of it, it is going to provide big saving not only in the expenditure but it will also lead to longer life of military assets, increased availability, improved safety, and employment of lesser number of crew. Military assets face complex operating environments which triggers all possible types of corrosion to include Corrosion of metals in the corrosive media like seawater, chemicals, acids, gases etc., Galvanic corrosion, Bio-fouling driven corrosion, Graphitization of cast iron, Stress corrosion, Dezincification, Fretting corrosion, Pitting corrosion, Intergranular corrosion, Corrosion fatigue, Biofouling and Microbial influenced corrosion etc. This Symposia will focus the highlights on the problems faced and recent developments in Defence sector.

Chair: Dr. Baloji Naik Ramavath

Corrosion in Nuclear Industry, Power Plant and Utilities

Experiences with corrosion and corrosion control in power plants (thermal, nuclear, hydro, solar) and in various utilities for these plants and also those for captive power plants. Aspects related to material selection, case studies related to failures, implementation of measures to avoid corrosion, water chemistry measures, corrosion monitoring and modelling are covered. Papers related to research on specific issues for these plants as well as those for development of corrosion resistant materials are included. Corrosion of candidate materials for use in future plants (supercritical thermal/nuclear, molten salt etc.) having aggressive conditions are also covered.

Chair: Dr. Supratik Roychowdhury

Corrosion in Oil and Gas Sector

From exploration and production to refining and distribution, corrosion threatens critical infrastructure, poses environmental and safety risks, and drives up operational and maintenance costs. The ever-increasing demand for energy, harsher operating environments, the use of advanced materials, and stricter regulatory frameworks have only added to the complexity of corrosion control. In upstream industry, corrosion challenges are faced in Wells and Wellbores, Production Systems, Offshore Platforms, Onshore Production Facilities, Artificial Lift Systems, Injection Systems etc. Corrosion intensive segments in refineries include Desalter, **Crude Distillation Unit, Hydrotreating Units, Fluid Catalytic Cracking Unit, Coker Units, Sulfur Recovery Units, Amine Treating Systems, Sour Water Strippers, etc. Heat Exchangers, Coolin Water and Fire Water Systems, Oil and Gas Storage and Pipelines are some of the common areas where both upstream and downstream industry face corrosion.**

This symposium provides a vital platform to discuss emerging corrosion threats, share knowledge on innovative mitigation strategies, explore advances in materials and protective technologies, and exchange best practices spanning upstream, midstream, and downstream sectors. Lessons learnt from failures will be a part of the symposium. Work on Data Analytics, Machine Learning and Artificial Intelligence will also be encouraged for presentation and discussion. New areas of research and application in corrosion prevention, control and management can also be presented in this symposium.

Chair: Dr. Anil Bhardwaj

Corrosion in Petrochemical, Refineries and Fertilizer Industry

Corrosion control in **petrochemical industries** involves mitigating corrosion and fouling, understanding corrosion mechanisms, assessing material performance, life assessment, predictive modelling, and developing new technologies. In **refineries**, key challenges include different forms and mechanisms of corrosion in specific environments such as distillation and hydroprocessing units, with control methods involving design optimisation, environmental modification, cathodic and anodic protection, and advanced coatings. **Fertilizer industries** face corrosion due to raw materials and process environments, especially in urea manufacturing plants, requiring stainless steel applications, passivation technologies, and optimised inspection programs. Across these sectors, research, case studies, and application of innovative materials and technologies remain vital for effective corrosion management and asset integrity enhancement.

Chair: Amish Jani

Corrosion Monitoring and Testing

Corrosion monitoring and testing are essential for identifying potential failure mechanisms in components, equipment, and industrial systems; failures that can often lead to serious operational and safety consequences. By applying a range of diagnostic techniques, it is possible to detect material defects from the manufacturing stage through to in-service degradation. Early identification and accurate assessment of corrosion help quantify damage, determine root causes, implement corrective actions, and integrate findings into long-term maintenance and safety strategies.

This symposium will focus on a broad spectrum of corrosion monitoring and testing methodologies, including:

- Non-destructive testing (NDT) techniques
- Real-time and online monitoring systems
- Advanced sensors and corrosion probes
- Research and development of innovative tools
- Case studies on damage evaluation and life prediction
- Material selection and compatibility analysis
- Training and skill development for corrosion professionals
- Field experiences and best practices from operational sites

Contributions highlighting practical applications, research innovations, and industry insights are highly encouraged.

Chair: Sandeep Vyas

Direct Assessment Methodology Application

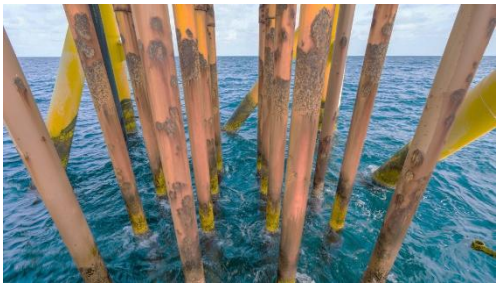
This track invites papers related to the application of Direct Assessment (DA) as a pipeline integrity assessment/ validation technique for oil, gas, water or any other unique products pipelines. Could include experiences/ successes/ gaps/ challenges/ learnings/ developments from an External Corrosion Direct Assessment (ECDA) or Internal Corrosion Direct Assessment (ICDA) or Stress Corrosion Cracking Direct Assessment (SCCDA) program. Papers could include any or all the steps of a DA program, DA’s relation to In Line Inspection (ILI) or to the complete pipeline integrity management program for onshore/ offshore, piggable/ non-piggable pipelines.

Chair: Ashish Khera

Marine Corrosion

Marine Corrosion is a significant challenge in marine environments, where metal structures are constantly exposed to harsh conditions. The salty seawater, fluctuating temperatures, and the presence of marine organisms & Biofouling accelerate the deterioration of metals, leading to costly repairs and potential structural failures. Corrosion costs the maritime industry between $00 and $ 100 billion annually not including indirect costs.

The Marine Corrosion Symposia invites contributions from researchers, academia, industry professionals, and practitioners addressing all aspects of corrosion and degradation processes in marine environments.



The scope includes, but is not limited to:

- Marine and seawater corrosion examination and mechanisms.
- Biofouling and antifouling technologies.
- Corrosion monitoring, testing, and inspection methods.
- Protective coatings, cathodic protection, and corrosion-resistant materials to mitigate marine corrosion.
- Case studies from offshore, naval, and coastal infrastructure.
- Modeling and simulation of corrosion processes.
- Innovations in materials and surface engineering for marine applications.
- Environmental impact and sustainability considerations in corrosion control.
- Data-driven approaches, sensor networks, and digital twins for corrosion management.

Submissions may include experimental research, field data, authentic observations, technology development, and critical reviews of current practices.

Chair: Dr. Shashi Bhushan Arya

Materials and Composites:

Materials and composites play a vital role in corrosion resistance. Advanced alloys, ceramics, and polymer-based composites are engineered to withstand harsh environments by limiting chemical reactivity, forming protective barriers, or self-healing. Their selection directly impacts durability, safety, and lifecycle costs in infrastructure, marine, and industrial applications exposed to corrosive agents.

Unpublished work related to corrosion resistant materials and composites (both metals and non-metals). Studies related to mechanisms of corrosion performance by these materials, new materials and composites development, and their application, design of new techniques for making such materials, etc. Corrosion and degradation of composites will also be covered in this symposium. Composite structural materials and forms, composite coatings, smart composite coatings, Fiber-reinforced polymer (FRP) composites, Ceramic Matrix Composites (CMCs), Nanocomposites in various application environments eg, chemical processing, marine and offshore, oil and gas, water treatment and infrastructure, etc.

Chair: Dr.-Ing. Smrutiranjan Parida

Microbial Corrosion & Inhibitors

Fundamental and applied aspects of Microbiologically Influenced Corrosion (MIC)/ Biocorrosion, advanced methodologies for identification of microbial community and their enumeration. Understanding the mechanism of MIC and use of biocides for industrial applications to control microbial population causing MIC. Topics may cover understanding of microbiologically influenced corrosion (MIC), detection, enumeration of microbial population, identification of microbes concerned to corrosion problems, Biofilm formation and material behaviour under bio-films, Monitoring techniques, MIC control strategies - biocides dosage and their monitoring, bio-electrochemical techniques, case studies on MIC/ corrosion failures; futuristic trends and new tools for detection and control.

The Corrosion inhibition implied under this symposium covers behaviour of organic, inorganic and newly termed green inhibitor compounds, polymeric compounds etc intended for industrial corrosion preventive applications in various fields like oil & gas, nuclear, water, aviation, coal, construction, food and related industries, biofuels etc. along with specific tools including software techniques for efficiency monitoring of corrosion inhibitors in running plants.

Chair: Dr. Jaya Rawat

Young Students & Scientist Forum

This forum is dedicated to fostering the next generation of corrosion professionals by providing an exclusive platform for students and young researchers to present their work. Papers are invited from undergraduate, postgraduate, and doctoral students on any topic covered within the conference symposia.

The objective is to encourage students to showcase their research, innovative ideas, case studies, and experimental investigations in corrosion science, engineering, and management. Contributions can include fundamental studies, novel experimental approaches, simulation and modelling, material development, field observations, or innovative mitigation and monitoring strategies.

This forum not only provides students an opportunity to interact with industry experts and academicians but also to gain confidence, receive constructive feedback, and build networks for future research and career growth in the field of corrosion and its control.

Chair: Lt. Dr. H V Jayaprakash