Thank You to our 2019 Sponsors:

1. ANOTEC
   Silicon Iron Anodes

2. icc

3. RUSTROL
   SYSTEMS

4. MAX
   MAGNESIUM
   ANODES

5. BRENNTAG

6. SURFACE
   SCIENCE
   WESTERN

7. CORROSION
   SERVICE

8. NACE
   INTERNATIONAL
   FOUNDATION OF CANADA

9. NACE
   INTERNATIONAL
   CANADIAN NATIONAL
   CAPITAL SECTION

10. NACE
    INTERNATIONAL
    NORTHERN
    AREA

11. ALGONQUIN
    COLLEGE
    Applied Research
    & Innovation

12. SPC
    SPECIALTY POLYMER COATINGS
Hello and welcome:

On behalf of the Conference Committee, I would like to welcome everyone to the 2019 Northern Area Eastern Conference here in Ottawa.

We have a very interesting program of presentations covering a wide range of corrosion topics and a trade show exhibition featuring displays from 18 organizations.

I would like to thank our exhibitors for participating in the show and our sponsors for their generous support of the conference events.

I trust that you will find the presentations and displays to be interesting and informative—and that you enjoy meeting your fellow corrosion engineers during the coffee breaks, lunch breaks and receptions.

For those visiting Ottawa for the first time, the following are within an easy 10 – 20 min. walk from the conference hotel: National Arts Centre, National Gallery, Parliament Buildings, Rideau Canal Locks and Chateau Laurier.

Thank you for attending the 2019 NACE Northern Area Eastern Conference.

Sincerely,

Nafiseh Ebrahimi Ph.D., P.Eng.
Conference Chair
2019 Eastern Area Conference
Code of Ethics

THE FUNDAMENTAL PRINCIPLES
Members uphold and advance the integrity, honor, and dignity of the members' profession by using their knowledge and skill for the enhancement of human welfare; being honest and impartial, and serving with fidelity the public, their employers, and clients; and striving to increase the competence and prestige of the corrosion engineering profession.

THE FUNDAMENTAL CANONS
A. Members shall hold paramount the safety, health, and welfare of the public in the performance of their professional duties.
B. Members shall perform services only in the areas of their competence.
C. Members shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those members under their supervision.
D. Members shall act in professional matters for each employer or client as faithful agents or trustees and shall avoid conflicts of interest.
E. Members shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
F. Members shall associate only with reputable persons or organizations.
G. Members shall issue public statements only in an objective and truthful manner.
H. Members shall not maliciously injure the reputation, prospects, or business of others, but this does not remove the moral obligation to expose unethical conduct.

NACE International specifically prohibits sexual harassment by or against any employee, member, officer, director, or other volunteer, vendor, or customer; and such conduct will not be permitted or condoned.

Anti-Harassment Policy

NACE is committed to providing an environment free of sexual harassment (which includes harassment based on gender, pregnancy, childbirth, or related medical conditions), as well as harassment based on such factors as race, color, religion, national origin, ancestry, age, physical disability, mental disability, medical condition, marital status, sexual orientation, gender identity, gender expression, workers’ compensation leave, veteran status, or any other condition or characteristic protected by law.

We expect all participants at NACE Northern Area Eastern Conference to abide by this Anti-Harassment Policy in all venues at Northern Area Eastern Conference, including ancillary events and official and unofficial social gatherings.

- Exercise consideration and respect in your speech and actions.
- Refrain from demeaning, discriminatory, or harassing behavior and speech.
- Be mindful of your surroundings and of your fellow participants.
- Alert NACE staff if you notice harassment.

*If you are being harassed, notice that someone else is being harassed, or have any other concerns, please contact Reygie de Borja at +63 917 654 1108 on-site immediately.*

Alcohol Consumption Policy

NACE International is committed to the health and well-being of its staff, members, customers, event participants, and vendors. The Association expects individuals who choose to consume alcohol at NACE-affiliated events to do so legally and in moderation. The use of alcoholic beverages by any participant at a NACE-affiliated event shall be in compliance with federal, state and local laws. Persons who infringe upon the rights of others, who conduct themselves in a disorderly manner, or who damage or destroy property shall be subject to disciplinary and/or criminal action. All NACE Northern Area Eastern Conference participants are expected to abide by this alcohol policy in all venues at NACE Northern Area Eastern Conference, including ancillary events and official and unofficial social gatherings. Participants shall conform to the requirements of this Policy and all other applicable NACE International policies, including but not limited to the NACE Code of Ethics and anti-harassment policies.
## Schedule of Events

<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, October 20, 2019</td>
<td>Registration</td>
<td>2 – 5 p.m.</td>
</tr>
<tr>
<td></td>
<td>Exhibitor Setup</td>
<td>2 – 5 p.m.</td>
</tr>
<tr>
<td></td>
<td>Welcome Reception</td>
<td>5 – 7 p.m.</td>
</tr>
<tr>
<td>Monday, October 21, 2019</td>
<td>Registration</td>
<td>8 a.m. – 5:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>Program</td>
<td>9 a.m. – 5:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>noon – 1:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>Exhibit Hall Happy Hour</td>
<td>5:30 – 7:30 p.m.</td>
</tr>
<tr>
<td>Tuesday, October 22, 2019</td>
<td>Registration</td>
<td>8 a.m. – 5 p.m.</td>
</tr>
<tr>
<td></td>
<td>Program</td>
<td>9 a.m. – 5 p.m.</td>
</tr>
<tr>
<td></td>
<td>Evening Reception and Awarding</td>
<td>5 – 7 p.m.</td>
</tr>
<tr>
<td>Wednesday, October 23, 2019</td>
<td>Registration</td>
<td>8 a.m. – noon</td>
</tr>
<tr>
<td></td>
<td>Program</td>
<td>9 a.m. – noon</td>
</tr>
</tbody>
</table>

## Conference Committee

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Chair</td>
<td>Nafiseh Ebrahimi</td>
<td>National Research Council Canada</td>
</tr>
<tr>
<td>Conference Vice-Chair</td>
<td>Ali Elwafi</td>
<td>Algonquin College</td>
</tr>
<tr>
<td>Technical Program Chair</td>
<td>Frank Smith</td>
<td>Nickel Institute</td>
</tr>
<tr>
<td>Student Session Chair</td>
<td>Winston Revie</td>
<td>Rogers</td>
</tr>
<tr>
<td>Advisors</td>
<td>Sean Carter</td>
<td>CarterSpec, Inc.</td>
</tr>
<tr>
<td></td>
<td>Debra Boisvert</td>
<td>Target Products Limited</td>
</tr>
</tbody>
</table>
Floor Plan

Courtyard by Marriott Ottawa
Ottawa, Ontario, Canada
### Exhibitors/Booth Numbers

- **2019 Sponsors**

<table>
<thead>
<tr>
<th>Name</th>
<th>Booth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amcorr Products /VISCOTAQ</td>
<td>110</td>
</tr>
<tr>
<td><strong>Canadian Centre for Electron Microscopy</strong></td>
<td>207</td>
</tr>
<tr>
<td>Corrizion Canada, Inc.</td>
<td>211</td>
</tr>
<tr>
<td><strong>Corrosion Service Co., Ltd.</strong></td>
<td>203</td>
</tr>
<tr>
<td>Dairyland Electrical Industries</td>
<td>202</td>
</tr>
<tr>
<td>Denso North America</td>
<td>100</td>
</tr>
<tr>
<td>Ecomaterials</td>
<td>105</td>
</tr>
<tr>
<td>Eddyfi Technologies</td>
<td>103</td>
</tr>
<tr>
<td>Fischer Technology, Inc.</td>
<td>205</td>
</tr>
<tr>
<td>FinishMaster Canada, Inc.</td>
<td>108</td>
</tr>
<tr>
<td>GENEQ, Inc.</td>
<td>102</td>
</tr>
<tr>
<td>Hubbell Gas Connectors and Accessories - ThermOweld</td>
<td>104</td>
</tr>
<tr>
<td><strong>Interprovincial Corrosion Control Co., Ltd. / Rustrol Systems</strong></td>
<td>200</td>
</tr>
<tr>
<td>Mobiltex Data Ltd.</td>
<td>204</td>
</tr>
<tr>
<td>Nickel Institute</td>
<td>106</td>
</tr>
<tr>
<td>Russell NDE Systems</td>
<td>101</td>
</tr>
<tr>
<td>Sherwin Williams</td>
<td>209</td>
</tr>
<tr>
<td>Trenton Corporation</td>
<td>201</td>
</tr>
</tbody>
</table>
Don’t miss out on THE corrosion and protective coatings industry event of the year!

NACE is bringing the world’s largest corrosion conference & expo back to its home town, HOUSTON!

Expect CORROSION 2020 to be bigger than ever with more exhibits, more attendees, and more corrosion and coatings content.

Expand your professional network and build key business partnerships with:

6,000+ corrosion industry professionals from 60 countries

1,000+ hours of technical education, corrosion knowledge & professional development strategies for whatever your corrosion-fighting role

400+ companies from around the globe displaying the latest corrosion control products, technologies, and services

Save the date and visit nacecorrosion.org for more information on attending or contact sales@nace.org for exhibits and sponsorship opportunities.
## Technical Program

### SUNDAY, OCTOBER 20

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 5 - 7 p.m.    | Welcome Reception  
Enjoy drinks and hors d’oeuvres with fellow conference attendees |

### MONDAY, OCTOBER 21

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 8:45 – 9:15 a.m. | Opening Remarks: Nafis Ebrahimi, Conference Chair  
Welcome Remarks: Jeff Didas, Past NACE President |
| 9:15 – 10 a.m.   | Plenary Speech: Extending the Life of Nuclear Power Reactors - A Corrosion Perspective  
Presented by Robert Tapping, Canadian Nuclear Laboratories |
| 10 – 10:30 a.m.  | MORNING BREAK |

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 10:30 – 11 a.m. | The Role of the Corrosion Engineer in Contributing towards the United Nations Sustainable Development Goals  
Presented by Alexander Williamson, Williamson Integrity Services Ltd. |
| 11 – 11:30 a.m. | The New NACE Corrosion Management Standard and its Role in Supporting Sustainability  
Presented by Richard Eckert, DNV GL |
| 11:30 a.m. – noon | Increased Sustainability of Corrodeble Assets Through Use of a Corrosion Management Maturity Model  
Presented by Elaine Bowman, NACE International |
| 12-1:30 p.m.     | LUNCH BREAK |
| 1:30 – 2 p.m.     | Properties and Applications of Plasma Electrolytic Oxidation Coatings on Light Alloys  
Presented by Vahid Dehnavi, Western University, Surface Science Western |
| 2 – 2:30 p.m.     | Synthesis and Characterization and Antimicrobial Properties of Ag, Au-Polymer Nanocomposite Films  
Presented by Ali Sbaei, Mabruk Oil Operation (Total-Libya) |
| 2:30 – 3 p.m.     | Autogenous Chemical and Structural Transition and the Wettability of Electropolymerized PANI Surface  
Presented by Yoganandan Govindaraj, IITB |
| 3 – 3:30 p.m.      | AFTERNOON BREAK - Sponsored by Interprovincial Corrosion Control |
| 3:30 – 4 p.m.     | Adverse Effect of Increased Climatic Temperature on Corrosion Resistance of Reinforced Concrete Structures – Presented by Nafiseh Ebrahimi, National Research Council Canada |
| 4 – 4:30 p.m.     | Climate Change Impact on Design Service Life of Concrete Bridge Decks Exposed to Chlorides  
Presented by Jieying Zhang, National Research Council Canada |
| 4:30 – 5 p.m.     | Hot-Dip Galvanized Rebar Performance in Bridge Decks  
Presented by Godfroy St-Pierre, Corbec, Inc. |
| 5 – 5:30 p.m.     | Accelerated Corrosion of Carbon Steel Rebar in Presence of Iron Sulfide Minerals in Concrete Mix  
Presented by Jon Makar, National Research Council Canada |
| 5:30 – 7:30 p.m.   | Exhibitor Reception - Sponsored by NACE Northern Area  
Enjoy drinks and hors d’oeuvres with our Exhibitors. |

### Environmental and Economic Sustainability Session - Macdonald

- Advanced Corrosion Resistant Thermal Diffusion Coatings for Enhancement of Equipment Performance in Heavy Oil Production  
Presented by Eugene Medvedovski, Endurance Technologies, Inc. |
- High Temperature-High Pressure Corrosion of Steels in 3.5wt% NaCl and CO2 Environment  
Presented by Md. Aminul Islam, National Research Council Canada |
- Field and Shop-Applied Pipeline Coatings in Canada (CSA Z245.30)  
Presented by Pablo Fernandez Marchi, CSA Group |

### Oil & Gas Session - Cartier

- 1975 to 2019 – 45 Years of Cathodic Protection & Corrosion Control Experiences and the Changes in the Industry  
Presented by Jeffrey Didas, MATCOR, Inc. |
- Decouplers and AC Mitigation Station Decoupling  
Presented by Timothy Bechtel, Dairyland Electrical Industries |
- CP Application on Bare Bottom Plates of Storage Tanks, Considerable IR Drop and Misleading Field Data  
Presented by Askar Soltani, SPGC (South Pars Gas Complex) |

### Environmental and Economic Sustainability Session - Macdonald

- Enhanced Corrosion Management Maturity Model  
Presented by Elaine Bowman, NACE International

### Oil & Gas Session - Cartier

- 1975 to 2019 – 45 Years of Cathodic Protection & Corrosion Control Experiences and the Changes in the Industry  
Presented by Jeffrey Didas, MATCOR, Inc. |
- Decouplers and AC Mitigation Station Decoupling  
Presented by Timothy Bechtel, Dairyland Electrical Industries |
- CP Application on Bare Bottom Plates of Storage Tanks, Considerable IR Drop and Misleading Field Data  
Presented by Askar Soltani, SPGC (South Pars Gas Complex) |

### Research and Development Session - Cartier

- Investigating the Effect of Chloride Concentration on the Pitting Probability of Copper Using Coupled Multielectrode Arrays  
Presented by Sina Matin, University of Western Ontario |
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenter</th>
</tr>
</thead>
</table>
| 8:30 – 9 a.m.| **Research and Development Session - Macdonald**                      | Probing the Corrosion Processes Using Electrochemical, Spectroscopic and Microscopic Techniques  
Presented by David Shoesmith, University of Western Ontario | Improving Cathodic Protection System Performance with Vapor Corrosion Inhibitors for Aboveground Storage Tank Soil-Side  
Bottom Corrosion Protection  
| 9 – 9:30 a.m.| **Cathodic Protection Session - Cartier**                             | Effect of Surface Treatment Processes on Alloy Corrosion in Hydrothermal Liquefaction Environment  
Presented by Elliott Asare, McMaster University | Changing Conditions: New Technology in Flange Isolation  
Presented by Glenn Ormsby, Garlock Pipeline Technologies |
| 9:30 – 10 a.m.| **Research and Development Session - Macdonald**                      | Synthesis and Characterization of Imidazoline Corrosion Inhibitors Obtained from Ecuadorian Palm Derivatives  
(Elaeis guineensis)  
Presented by Jhon Quinaluisa, Escuela Politécnica Nacional | Cathodic Protection Current Diversion to Carrier Pipe with VCI Gel Annulus Fill in Cased Pipelines  
| 10 – 10:30 a.m.| **MORNING BREAK - Sponsored by Surface Science Western**               |                                                                                                                                             |                                                                                                               |
| 10:30 – 11 a.m.| **Research and Development Session - Macdonald**                      | Effect of Impurities on Copper Corrosion Performance  
Presented by Sridhar Ramamurthy, University of Western Ontario | CP and AC Considerations for New Pipeline Installed in Granite  
Presented by Scott McLean, Enbridge Gas, Inc. |
| 11 – 11:30 a.m.| **Research and Development Session - Macdonald**                      | Half-Cell Potential Guidelines for Corrosion Assessment of Galvanized Reinforcing Steel in Concrete Structures  
Presented by Jieying Zhang, National Research Council Canada | Review of an In-House GIS-Based CP Data Collection System  
Presented by Stephen Mott, Enbridge Gas, Inc. |
| 11:30 a.m. – noon| **Research and Development Session - Macdonald**                      | Material’s Investigations and Impact on Viscoseal Performances  
Presented by Fatima Bouyahia, National School of Applied Science Morocco | Cathodic Protection System for Subsea Oil & Gas Development; Challenges, Solution and System Reliability  
Presented by Chijindu Nzuruba, Lujo Integrated Services Limited |
| 12 -1:30 p.m.| **LUNCH BREAK**                                                       |                                                                                                                                             |                                                                                                               |
| 1:30 – 2 p.m.| **Oil & Gas Session - Macdonald**                                    | Best Approach for Determining the Overall Performance of Corrosion Inhibitors During Oilfield Trials for Water Injection and Crude Oil Transport Pipeline  
Presented by Joseph Emmanuel, ADNOC Onshore | Student Session                                                                 |
| 2 – 2:30 p.m.| **Monitoring and Inspection Session - Macdonald**                     | Efficient Design and Optimizing Parameters of Sour Gas Conditioning Plant  
Presented by Abdukareem Ahmamed, Qatar Environment and Energy Research Instantiate | Student Session                                                                 |
| 2:30 – 3 p.m.| **Afternoon Break - Sponsored by Surface Science Western**            |                                                                                                                                             |                                                                                                               |
| 3 – 3:30 p.m.| **Monitoring and Inspection Session - Macdonald**                     | Evaluating AC Interference Corrosion Risk and Mitigation Effectiveness for NACE SP21424 Compliance  
Presented by Jamey Hilleary, Elecsys Corporation |                                                                                                               |
| 3:30 – 4 p.m.|                                                                                                                                  | Coating Thickness Measurement Technology & Factors that Affect Your Readings  
Presented by Gary Efronson, Fischer Technology, Inc. |                                                                                                               |
| 4 – 4:30 p.m.|                                                                                                                                  | Managing the Threat of Hydrogen Induced Cracking at Aging Facilities  
Presented by Mohamed Saif Elid Atta, Saudi Aramco |                                                                                                               |
| 4:30 – 5 p.m.|                                                                                                                                  | Technologies for Network Integrity  
Presented by Ihsan Al-Taie, Saudi Aramco |                                                                                                               |
| 5 - 7 p.m.   | **Evening Reception - Sponsored by NACE Canadian National Capital Section**                                                  | Enjoy drinks and hors d’oeuvres as we announce the conference awardees |                                                                                                               |
**WEDNESDAY, OCTOBER 23**

<table>
<thead>
<tr>
<th>Time</th>
<th>Case Studies Session - Macdonald</th>
<th>Materials Selection Session - Cartier</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 – 9 a.m.</td>
<td>Technical Study of Scale Formation in the Flow Lines of Some Oil Wells at Mabruk Field</td>
<td>Why Thermoplastics Fail - Key Engineering Considerations for a Long, Reliable Life</td>
</tr>
<tr>
<td></td>
<td>Presented by Ali Sbaei, Mabruk Oil Operation (TOTAL-Libya)</td>
<td>Presented by Michelle Knight, Lubrizol</td>
</tr>
<tr>
<td>9 – 9:30 a.m.</td>
<td>The Use of Sealing Materials to Mitigate Corrosion</td>
<td>The Role of the Copper-to-Steel Area Ratio in the Galvanic Corrosion of Steel in the Presence of Chloride</td>
</tr>
<tr>
<td></td>
<td>Presented by Anthony Currie, Flexitallic Canada</td>
<td>Presented by Lindsay Braithwaite, University of Western Ontario</td>
</tr>
<tr>
<td>9:30 – 10 a.m.</td>
<td>Stress Corrosion Cracking of HVAC Copper Lines – An Unintended Consequence of Moisture Exposure During Construction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presented by Alan Humphreys, Simpson Gumpertz and Heger</td>
<td></td>
</tr>
<tr>
<td>10 – 10:30 a.m.</td>
<td>MORNING BREAK</td>
<td></td>
</tr>
<tr>
<td>10:30 – 11 a.m.</td>
<td>Application of Good Experience - Success Analysis</td>
<td>An Electrochemical Study of the Integrated Effect of Temperature, Solution pH, and Sulphide Concentration on the Corrosion of Copper Nuclear Waste Containers</td>
</tr>
<tr>
<td></td>
<td>Presented by Joseph Emmanuel, ADNOC Onshore</td>
<td>Presented by Mengnan Guo, Western University</td>
</tr>
<tr>
<td>11 – 11:30 a.m.</td>
<td>Study on Elemental Sulfur Formation from Black Powder Deposits</td>
<td>Corrosion study of five high performance metals subjected to high pressure and elevated temperatures in supercritical CO₂ environment</td>
</tr>
<tr>
<td></td>
<td>Presented by Yousef Khuralbut, Kuwait Oil Company</td>
<td>Presented by Margarita Ilinich, CanmetENERGY – Ottawa</td>
</tr>
<tr>
<td>11:30 a.m.– noon</td>
<td>Microbiologically Influenced Corrosion Investigation for Refinery Crude Stabilization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presented by Abdulmohsen Al-Humam, Saudi Aramco</td>
<td></td>
</tr>
</tbody>
</table>

**Student Posters**

- Effect of the Structure and Composition of Mill Scale on Localized Corrosion Susceptibility of X70 Grade Linepipe Steel – Presented by Sara Filice, McMaster University
- Effect of Surface Treatment on Corrosion Resistance of Candidate Alloys for Hydrothermal Biomass Conversion in Near-Critical Water – Presented by Elliott Asare, McMaster University
- Unexpected Loss of Protection Current Due to Galvanic Corrosion within a Junction Box of a Sacrificial Cathodic Protection System – Presented by Hussein Kuwafi, Great Man Made River Project of Libya
- Potentiodynamic polarization method of determining critical chloride threshold of carbon and stainless steel rebar in synthetic concrete pore solution – Presented by Ibrahim Ogunsanya, University of Waterloo
- Atomic Emission Spectroelectrochemistry (AESEC) in the investigation of the Behaviour of Alloying Elements – Presented by Jeffrey Henderson, University of Western Ontario
- Effect of Temperature on Chloride Threshold of Reinforcing Steel in a Changing Climate – Presented by Amin Ghaziaskar, National Research Council Canada
- Investigating the Effect of Chloride Concentration on the Pitting Probability of Copper Using Coupled Multielectrode Arrays – Presented by Sina Matin, University of Western Ontario
- Improved Surface Micro-Structural and Enhanced Corrosion Resistance of Boiler Steel Gr A1 via Friction Stir Processing – Presented by Supreet Singh, Chandigarh University
- The Role of the Copper-to-Steel Area Ratio in the Galvanic Corrosion of Steel in the Presence of Chloride – Presented by Lindsay Braithwaite, The University of Western Ontario
- The Effect of pH and Various Anions on the Growth of Sulphide Films on Copper in Aqueous Sulphide Solutions – Presented by Mengnan Guo, The University of Western Ontario
- An Investigation of the Corrosion Reduction Factor of MEG on API 5L-X65 in the Presence of a Domestic Amine-Based Corrosion Inhibitor by an RCE Setup – Presented by Askar Soltani, Science and Research Branch of Islamic Azad University