Track 1: Production Pipelines & Flowlines
Track Chair: Brandt Sanregret, Encana Services Company Limited
Track Sponsor: Alberta Energy Regulator

Topic 1-1: Production Pipelines & Flowlines

Session 1-1-1: Coal Bed Methane
Session Chair: Prabhu Srinivasan, Vermilion Energy
Session Co-Chair: Allan Hobbins, ConocoPhillips Canada
Room: HYATT Doll/Herald
Date: Tuesday, September 30
Time: 10:30 - 11:00

10:30
J. Zhou, X. Li, M. Cheng, T. Deng, J. Gong, China University of Petroleum

Session 1-1-2: Production Pipelines Posters
Session Chair: Mark Piazza, Colonial Pipeline Company
Room: TELUS Macleod Hall A
Date: Poster Session 1
Tuesday, September 30, 15:30 - 17:30
Date: Poster Session 2
Wednesday, October 1, 09:00 - 10:15

IPC2014-33397, Numerical Modeling for Steady-State Two Phase Flow in Gas-Condensate Pipeline
Z. Wang, J. Gong, T. Yin, China University of Petroleum

IPC2014-33276, The Interwell Pressure Matching Analysis of Different Topologies in the Gathering and Transporting System
J. Zhou, X. Li, M. Cheng, S. Zhou, J. Gong, China University of Petroleum

Session 1-1-3: Production Pipelines
Session Chair: Allan Hobbins, ConocoPhillips
Session Co-Chair: Prabhu Srinivasan, Vermilion Energy
Room: HYATT Doll/Herald
Date: Tuesday, September 30
Time: 11:00 - 16:00

11:00
IPC2014-33072, Case Study for Releasing Stuck Pig in Non-Metallic Pipeline
A. Al-Khaledi, H. Al-Zuwayer, F. Al-Ghanem, Kuwait Oil Company

Track 2: Project Management
Track Chair: Rod Trefanenko, PII Pipeline Solutions a GE Oil & Gas and Al Shaheen joint venture
Co-Chair: Art Harms, Three Streams Engineering Division Foster Wheeler Ltd.
Track Sponsor: ATOC Pipelines

11:30
IPC2014-33208, Combining Speed Control Function and Wye Passage in a Long Subsea Gas Line — A Case Study
H. J. Lindner, ROSEN Technology & Research Center GmbH; H. van Remmerden, ROSEN USA, Inc.; A. Shamgar, Williams

13:30
IPC2014-33716, Estimating Service Life of Pipelines Under CO₂ Corrosion: Application of a Methodology Based on Fitness for Purpose, Flow Assurance Simulation Tools, Reliability and Probabilistic Data Management to a Venezuelan Pipeline
Y. Peña, C. Sánchez, PDVSA INTEVEP S.A.; O. Chooa, O. Nóbrega, Universidad Central de Venezuela

14:00
IPC2014-33721, Heat-Traced Pipelines a Double-Containment Solution for a High-Temperature Pipeline
C. Geertsen, ITP InTerPipe

14:30
IPC2014-33741, Different Failure Modes of Non-Metallic Pipelines at Connections
A. Tatarov, F. Gareau, Skystone Engineering

15:30
IPC2014-33743, Failure Analysis of 12” Pipeline Riser
A. Tatarov, F. Gareau, Skystone Engineering

Topic 2-1: Project Management

Session 2-1-1: Project Management Session 1
Session Chair: Rod Trefanenko, PII Pipeline Solutions a GE Oil & Gas and Al Shaheen joint venture
Session Co-Chair: Art Harms, Three Streams Engineering Division Foster Wheeler Ltd.
Room: HYATT Stephen
Date: Wednesday, October 1
Time: 08:30 - 11:30

08:30
IPC2014-33517, Procurement Do’s and Don’ts
J. Nielsen, WorleyParsons Canada

09:00
IPC2014-33707, Safety in Mountain Field Investigations
S. Benay, WorleyParsons

09:30
Y. Ding, CNPC International Chad Ltd.; H. Hao, China National Petroleum Company (CNPC)
IPC2014-33756, Managing Large Tank API 653 Re-inspection Projects  
T. Greaves, Greens Project Solutions Inc./Kinder Morgan Canada

11:00
IPC2014-33188, Case Studies in Operational and Economic Impacts of Drag Reducing Agent on Crude Oil Pumping at Western Desert, Egypt  
H. Abdou, Agiba Petroleum Company

Session 2-1-3: Project Management Posters
Session Chair: Mark Piazza, Colonial Pipeline Company  
Room: TELUS Macleod Hall A  
Date: Poster Session 1  
Tuesday, September 30, 15:30 - 17:30  
Date: Poster Session 2  
Wednesday, October 1, 09:00 - 10:15

IPC2014-33190, Improvement Flowing Heavy Crude Oil by Development of Transportation Pipe Network  
H. Abdou, Agiba Petroleum Company

Track 3: Design & Construction
Track Chair: Austin Voss, Steel Reef Infrastructure Corp.  
Track Co-Chair: Ron Burdylo, WorleyParsons Canada  
Track Co-Chair: Mark McDougall, WorleyParsons Canada  
Track Sponsor: WorleyParsons

Topic 3-1: Design & Construction

Session 3-1-1: Geotechnical & Civil  
Session Chair: Ray Bolvin, Plateau Geotechnical  
Room: TELUS Macleod E1  
Date: Tuesday, September 30  
Time: 10:30 - 15:00

10:30
IPC2014-33049, Direct Pipe® as Alternative to HDD in Permeable Soil Conditions  
G. Lang, A. Pfeiff, Hemenknecht AG

11:00
IPC2014-33096, When HDD Construction Shifts Happen Insertion of a Casing Sleeve Mitigated a Major Threat to Completion of the Project  

11:30
IPC2014-33541, Considerations on the Use of the Pneumatic Hammer for HDD Pullback Assistance  
H. Zhou, Center for Reliable Energy Systems; M. Liu, Y. Wang, CRES; D. D’Elletto, National Grid US

Session 3-1-2: General Pipeline Construction  
Session Chair: Tony Griffin, UniversalPegasus International  
Room: TELUS Macleod E2  
Date: Tuesday, September 30  
Time: 10:30 - 14:30

10:30
IPC2014-33196, Field Testing of Pipeline Trench Backfill Properties  
R. McAffee, R. Phillips, C-CORE; M. Martens, TransCanada PipeLines

11:00
IPC2014-33239, Pipeline Separation: A Review of Requirements, Guidance and Best Practices  
R. McNallie, R. Phillips, C-CORE; M. Martens, TransCanada PipeLines

11:30
IPC2014-33250, Development of an Effective Pipeline Material Traceability and Compliance Program  
B. Vogt, L. Owen, Project Consulting Services

Session 3-1-3: General Pipeline Design  
Session Chair: Jim Kenny, Stantec Consulting  
Room: TELUS Macleod E1  
Date: Wednesday, October 1  
Time: 08:30 - 11:00

08:30
IPC2014-33038, Application of Reliability-Based Design Method of Pipeline Material Selection  
Z. Zhang, W. Wei Zhang, J. Zhang, Y. Liu, China Petroleum Pipeline Engineering Corporation

09:00
IPC2014-33530, Response of Buried District Heating Pipelines Under Relative Axial Movements  
M. Huber, D. Wijewickreme, University of British Columbia

10:30
IPC2014-33289, Strain Based Design Versus Preheat for Hotbit Pipelines  
G. King, I. Phiri, J. Greenslade, WorleyParsons

Session 3-1-4: Design & Construction Case Studies  
Session Chair: Tim Zboya, UniversalPegasus International  
Room: TELUS Macleod E2  
Date: Wednesday, October 1  
Time: 08:30 - 11:00

08:30
IPC2014-33136, Horizontal Directional Drilling Application in a Wide River Crossing in the Amazon Rain Forest  
R. Santana Nobrega Alves, B. Souza Filho, Petrobras Transporte S.A

09:00
IPC2014-33235, Pipeline Integrity Analyses for Construction in Mountainous Areas  
F. Zhang, R. Surface, Center For Reliable Energy Systems; M. Liu, Y. Wang, CRES; A. Phillips, TransCanada Pipelines
Session 3-1-5: Facility & Pipeline Modelling

**Session Chair:** Mark McDougall, WorleyParsons Canada  
**Room:** TELUS Macleod E1  
**Date:** Thursday, October 2  
**Time:** 08:30 - 11:30

08:30  
IPC2014-33018, Models and Methods of Determining the Minimum Stack Metal Temperature During Sonic Blowdown of Natural Gas  
C. Hartloper, K. Botros, NOVA Research and Technology Center; E. Abdalgawad, S. Reid, TransCanada Pipelines

09:00  
IPC2014-33237, Stress Analysis of Lifting and Lowering-In Process  
F. Zhang, Center For Reliable Energy Systems; M. Liu, Y. Wang, CRES; W. Bruce, Det Norske Veritas (U.S.A.)

09:30  
IPC2014-33740, Pump Station Design  
J. Homer, Enbridge Pipelines Inc.; M. DeBusman, Jacobs

10:30  
IPC2014-33134, A Stress Check Procedure for Pipe Lowering-In Process During Pipeline Construction  
D. Duan, T. Jurca, C. Zhou, TransCanada Pipelines

11:00  
IPC2014-33287, Venting of a 32 km NG Pipeline: Field Measurements and CFD Simulations  
A. Godbole, G. Michal, C. Lu, X. Liu, University of Wollongong; P. Venton, Venton & Associates Pty Ltd; N. Laidlaw, APA Group

Session 3-1-6: General Pipeline Design & Construction

**Session Chair:** Austin Voss, Steel Reef Infrastructure Corp.  
**Room:** TELUS Macleod E1  
**Date:** Thursday, October 2  
**Time:** 13:30 - 16:00

13:30  
M. Nessim, R. Adianto, C-FER Technologies

14:00  
IPC2014-33437, Limit States Design for Onshore Pipelines Designing for Hydrostatic Test Pressure and restrained Thermal Expansion  
R. Adianto, M. Nessim, C-FER Technologies

15:30  
IPC2014-33203, IWEX: New Horizons for Pipeline Girth-Weld AUT Inspection  
N. Portzgen, J. Schouten, X. Deleye, J. Van der Ent, APPLUS RTD
Session 4-1-2: Environmental & Social Issues
Session Chair: Jason Smith, TERA Environmental Consultants
Room: HYATT Walker/Bannerman
Date: Thursday, October 2
Time: 10:30 - 15:00

10:30
IPC2014-33506, Environmental Permitting of British Columbia Oil and Gas Commission Regulated Pipelines: Lessons From the Trenches
K. de Jong, P. M. Blancher, M. Scoular, Stantec

IPC2014-33751, Environmental Management and Mitigation: Enbridge Northern Gateway Pipeline Project
P. Anderson, RPS HSMA;
L. Postlewaite, Northern Gateway Pipelines;
J. E. Green, Stantec

11:00
IPC2014-33504, Understanding State Variability and Recommendations for Minimizing Schedule Risk in Pipeline Siting and Development

Session 4-1-3: Operations
Session Chair: John Hayes, Independent
Room: HYATT Walker/Bannerman
Date: Friday, October 3
Time: 08:30 - 11:30

08:30
IPC2014-33016, Measurements of NOx Emissions From DLE and Non-DLE Gas Turbine Engines Employed in Natural Gas Compressor Stations and Comparison With PEM Models
K. Botros, NOAA Research and Technology Center;
L. Stankowski, S. Barss, R. Manabat, TransCanada Pipelines

09:00
IPC2014-33152, Above Ground Petroleum Integrity Management Programs & Risk Analysis
Session Co-Chair: Zaheed Hasham, Dynamic Risk
Date: Thursday, October 2
Time: 08:00 - 11:00

09:00
IPC2014-33389, Economic Valuation of Environmental Goods and Services: An Impact Managing Tool for the Oil Spill in the Winchel River (Esmeraldas, Ecuador)
M. Aleman, Cardno ENTRIX;
A. Andrade Caballero, L. Martinez Forero, ROSEN Integrity Solutions

10:30
IPC2014-33355, Short Term Hydrotechnical Risk Control Measures Used During the Implementation of Watercourse Pipe Replacement Projects
B. Costerton, BC Rivers Consulting Inc.;
D. Dewar, E. McClarty, Spectra Energy Transmission;
O. Huisman, R. Almandoz, T. Schuster, A. Mendizabal, Oleoducto De Crudos Pesados;
S. Sarasti, COP Ecuador S.A.;
M. Soto, Cardno ENTRIX;
K. de Jong, L. LeBlanc, Enbridge Pipelines Inc.

11:00
IPC2014-33632, Risk Management for Lateral Channel Movement at Pipeline Water Crossings
J. Bracic, Pembina Pipeline Corporation;
D. Owen, Alliance Pipeline Ltd.;
S. Schapira, DNV GL

IPC2014-33622, The Pipeline Industry and Social Media
G. Douglas, TERA Environmental Consultants

IPC2014-33621, Pipeline Safety Targets and the Connection to Social License
W. Kresic, L. Harron, L. LeBlanc, Enbridge Pipelines Inc.

IPC2014-33377, If You Build It, Will They Come? Caribou Habitat Restoration for Pipeline Projects
B. Coupal, P. Bentham, Golder Associates Ltd.

IPC2014-33549, I Know it When I See It: Internal Corrosion Susceptibility Analysis
V. Habib, Det Norske Veritas (U.S.A.), Inc.

IPC2014-33543, Understanding State Variability and Recommendations for Minimizing Schedule Risk in Pipeline Siting and Development

IPC2014-33531, High Energy Natural Gas Internal Corrosion Susceptibility Analysis
D. Owen, Alliance Pipeline Ltd.;
S. Schapira, DNV GL

IPC2014-33513, A Novel Approach for Automatic Matching and Updating Pipeline Data
M. Morgan, L. Giles, Stantec

IPC2014-33599, Where to Look for Social License: Minimizing Schedule Risk in Pipeline Siting and Development

IPC2014-33598, Understanding State Variability and Recommendations for Minimizing Schedule Risk in Pipeline Siting and Development

IPC2014-33597, If You Build It, Will They Come? Caribou Habitat Restoration for Pipeline Projects
B. Coupal, P. Bentham, Golder Associates Ltd.

IPC2014-33596, Environmental Management and Mitigation: Enbridge Northern Gateway Pipeline Project
P. Anderson, RPS HSMA;
L. Postlewaite, Northern Gateway Pipelines;
J. E. Green, Stantec

IPC2014-33595, Environmental Management and Mitigation: Enbridge Northern Gateway Pipeline Project
P. Anderson, RPS HSMA;
L. Postlewaite, Northern Gateway Pipelines;
J. E. Green, Stantec

IPC2014-33594, Environmental Management and Mitigation: Enbridge Northern Gateway Pipeline Project
P. Anderson, RPS HSMA;
L. Postlewaite, Northern Gateway Pipelines;
J. E. Green, Stantec

IPC2014-33593, Environmental Management and Mitigation: Enbridge Northern Gateway Pipeline Project
P. Anderson, RPS HSMA;
L. Postlewaite, Northern Gateway Pipelines;
J. E. Green, Stantec
Track 6: Pipeline Integrity Management

**Session 6-1: Continuous Improvement**

**Session 6-1-1: Management Systems & Engineering Assessments**

Session Chair: Monica Porter, Dynamic Risk Assessment Systems Inc.

Room: TELUS Glen 201/202

Date: Tuesday, September 30

Time: 10:30 - 17:00

- **10:30**
  IPC2014-33236, A Structured Approach for Managing Engineering Assessments
  M. Reed, D. Skibinsky, Alliance Pipeline Ltd.; R. Sahney, PBoK Technical Training Ltd.

- **11:00**
  IPC2014-33549, An Engineering Assessment to Evaluate Integrity Options for Out of Class Pipelines
  H. Wang, S. Kariyawasam, P. Kwong, TransCanada Pipelines

- **11:30**
  IPC2014-33674, Effective Improvements to Overcome Blind Spots in A Corrosion Management Program and Practical Measures to Verify Effectiveness
  T. Huang, S. Kariyawasam, P. Yeung, M. Shariq, TransCanada Pipelines

**Session 6-1-2: In-Line Inspection—Validation**

Session Chair: Alasdair Clyne, Rosen Canada Ltd.

Room: TELUS Glen 206

Date: Tuesday, September 30

Time: 10:30 - 16:30

- **10:30**
  IPC2014-33263, Towards Effective Pipeline Integrity Decision Making Under Uncertain Environment
  S. Hassanien, J. Gomez, J. Liang, R. Sporns, Enbridge Pipelines Inc.

- **11:00**
  IPC2014-33044, Validating ILI Accuracy Using API 1163
  L. Smart, H. Haines, Kiefner & Associates

- **11:30**
  IPC2014-33578, Evaluation of New In-Ditch Methods for Measurement and Assessment of External Corrosion
  P. Cazenave, K. Tinacos, M. Gao, Blade Energy; R. Wang, R. Kania, TransCanada Pipelines

**Session 6-1-3: Facilities Integrity Management Posters**

Session Chair: Mark Piazza, Colonial Pipeline Company

Room: TELUS Macleod Hall A

Date: Poster Session 1 - Tuesday, September 30, 15:30 - 17:30

Date: Poster Session 2 - Wednesday, October 1, 09:00 - 10:15

- **11:30**
  IPC2014-33678, Correlating Corrosion Field Data with Experimental Findings for the Development of Pipeline Mitigation Strategies
  K. Chevil, W. Chen, University of Alberta; R. Karia, TransCanada Pipelines; G. Van Boven, Spectra Energy

- **14:00**
  IPC2014-33676, Back to the Future Using Root Cause Analysis as a Proactive Risk Management Tool
  P. Nidd, Dynamic Risk USA; T. Thom, M. Porter, Dynamic Risk Assessment Systems Inc.
### Session 6-1-3: In-Line Inspections—Technology Advancements

**Session Chair:** Mohamed R. Chebaro, Enbridge Pipelines Inc.  
**Session Co-Chair:** David Norfleet, DNV GL  
**Room:** TELUS Glen 201/202  
**Date:** Wednesday, October 1  
**Time:** 08:30 - 12:00

#### 08:30
IPC2014-33441, A Novel Approach for Pipe Grade Determination through In-line Inspection (ILI)  
D. Molenda, W. Thale, ROSEN Technology & Research Center

#### 09:00
IPC2014-33647, How Safe Failure Pressure Ratios are Related to %SMYS  
S. Karayamasam, T. Huang, TransCanada Pipelines

#### 09:30
IPC2014-33238, Development of a 150°C Geopig Inertial Mapping Tool for Pipeline Strain Monitoring  
B. Dreger, D. Waalen, M. Clark, Suncor Energy; J. Smith, J. Bartlow, S. Westwood, Baker Hughes Ltd.

#### 10:30
IPC2014-33209, Critical Crack Size Detection Criteria to Develop a Novel ILI Tool for Non-Piggable Gas Pipelines  
H. Al-Muslim, Kiefer and Associates c/o Saudi Aramco; M. Rosenfield, Kiefer/Applus RTD; D. W. Mente, NYSEARCH/Northeast Gas Association

### Session 6-1-4: Data Management & Integration

**Session Chair:** Usman Choudhary, TransCanada Pipelines Limited  
**Session Co-Chair:** Omar Al Emrani, TransCanada Pipelines Limited  
**Room:** TELUS Glen 206  
**Date:** Wednesday, October 1  
**Time:** 09:00 - 11:30

#### 09:00
IPC2014-33594, The Pipe Inspection Lifecycle  
D. Nemeth, Energy Transfer; T. Walda, Global Information Systems

#### 09:30
IPC2014-33708, Pipeline Integrity Data: Managing Past, Present, Future  
T. Porter, New Century Software Inc.; D. Donaho, Kinder Morgan Energy Partners L.P.

#### 10:30
IPC2014-33653, The Integrity Review Process for an Asset Acquisition  
C. Figueredo, S. Dawe, Enbridge Pipelines Inc.

#### 11:00
IPC2014-33648, Quantifying the Impact of Assumptions on Predicted Burst Pressure Assessments  
S. Polasek, T. Bubenik, DNV GL; S. Keane, Enbridge Pipelines Inc.; W. V. Harper, Otterburn University

### Session 6-2-1: Stress Corrosion Cracking

**Session Chair:** Jenny Been, TransCanada Pipelines Limited  
**Session Co-Chair:** Boon Ong, TransCanada Pipelines Limited  
**Room:** HYATT Stephen  
**Date:** Thursday, October 2  
**Time:** 08:30 - 14:00

#### 08:30
IPC2014-33088, The Effect of Shallow Cracks on the Predicted Failure Pressure of Natural Gas Pipelines Containing Stress-Corrosion Cracks  
R. Fessler, Biztek Consulting Inc.; S. Rapp, Spectra Energy

#### 09:00
IPC2014-33180, Bicarbonate, Temperature, and pH Influences on the Passivation of API-X100 Pipeline Steel in Simulated Groundwater Solutions  
I. Gadala, A. Alfantazi, University of British Columbia

#### 10:30
IPC2014-33325, Development and Validation of Load-Interaction Based Models for Crack Growth Prediction  
J. Zhao, W. Chen, University of Alberta; G. Van Boven, Spectra Energy; S. Keane, Enbridge Pipelines Inc.; J. Been, TransCanada Pipelines

#### 11:00
IPC2014-33282, Depressurization-Induced Crack Growth Enhancement for Pipeline Steels Exposed to Near-Neutral pH Environments  
M. Yu, W. Chen, University of Alberta; R. Kania, TransCanada Pipelines; G. Van Boven, Spectra Energy; J. Been, TransCanada Pipelines

#### 11:30
IPC2014-33037, Experimental and Analytical Leak Characterization for Axial Through-Wall Cracks in a Liquids Pipeline  
M. R. Chebaro, A. C. Sutton, Enbridge Pipelines Inc.; N. Yoosif-Ghodsi, J. H. Bergman, C-FER Technologies; D. M. Norfleet, Det Norske Veritas (U.S.A.)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 6-2-2: ILI – Cracking Threat</th>
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<tbody>
<tr>
<td>11:00</td>
<td>IPC2014-33059, Characteristics, Causes, and Management of Circumferential Stress-Corrosion Cracking</td>
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<td>R. Fessler, Biztek Consulting Inc.; M. Shen, Enbridge Pipelines Inc.</td>
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<td><strong>Session Chair:</strong> Kevin Spencer, PII Pipeline Solutions</td>
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<td><strong>Room:</strong> TELUS Glen 206</td>
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<td><strong>Date:</strong> Thursday, October 2</td>
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<td><strong>Time:</strong> 08:30 - 15:00</td>
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<tr>
<th>Time</th>
<th>IPC2014-33025, Determining Reassessment Intervals From Successive In-Line Inspections</th>
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<tr>
<td>09:00</td>
<td>T. Bubenik, P. Moreno, S. Polsiski, DNV GL; W. V. Harper, Otterbein University</td>
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<td><strong>IPC2014-33104, Integration of Laser Surface Scanning and Non-Linear Finite Element Analysis for</strong></td>
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<td><strong>the Assessment of Volumetric Corrosion in Pipeline Fittings</strong></td>
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<td>R. Andrews, M. Hadden, P. Casson, MACAW Engineering; T. Kashap, S. Johnstone, National Grid</td>
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<tr>
<th>Time</th>
<th>IPC2014-33113, Pipeline Sludge Sampling for Assessing Internal Corrosion Threat</th>
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<tr>
<td>10:30</td>
<td>A. Garcia, T. Place, Enbridge Pipelines Inc.; M. Holm, TEK Services Inc.; J. Sargent, GE Water</td>
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<td>and Power &amp; Water</td>
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<td><strong>Bayesian Dynamic Linear Model</strong></td>
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<td>S. Zhang, S. Kariyawasam, M. Al-Amin, TransCanada Pipelines; W. Zhou, Western University</td>
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<th>Time</th>
<th>IPC2014-33329, The Detection Method and Its Practice of Dynamic Stray Current Interference from</th>
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<tr>
<td>11:00</td>
<td>Subway Power System</td>
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<td>M. Li, X. Wang, Fushun Research Institute of Petroleum and Petrochemicals; H. Pu, SINDPEC Gas</td>
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<td>Company; S. Lin, Qi Mao, Genus Technology and Engineering Ltd.</td>
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<th>Time</th>
<th>IPC2014-33369, Internal Corrosion Management of Crude Pipelines</th>
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<tr>
<td>11:30</td>
<td>S. Prakash, S. Safri, A. Razaq Al-Shamari, A. Abdullah Jarragh, Kuwait Oil Company</td>
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<th>Time</th>
<th>IPC2014-3337, Effects of Temperature and Glass Transition on the Performance of Polymer Coating on</th>
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<tr>
<td>13:30</td>
<td>Steels</td>
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<td>H. Ha, A. Alfantazi, University of British Columbia</td>
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</table>
**Session 6-3-2: Weather Related & Outside Forces — Geotechnical**

**Session Chair:** Rick Gailing, Southern California Gas Company  
**Room:** TELUS Glen 206  
**Date:** Thursday, October 2  
**Time:** 08:30 - 12:00

- **08:30**  
  IPC2014-33179, Fiber Optic Monitoring of Pipeline Subsidence: Analysis of Effective Sensor Cable Deployments  
  J. Rice, J. Bay, J. Peralta, Utah State University

- **09:00**  
  IPC2014-33497, Pipeline Stress Relief and Evaluation of Strain Measurement Technology at a Moving Slope  
  J. Malpartida Moya, G. Massucco De la Sota, Compañía

- **10:30**  
  IPC2014-33532, Performance Monitoring and Modeling of Small Diameter MDPE Natural Gas Pipelines Subject to Ground Movement  
  A. Dinovitzer, A. Fredj, BMT Fleet Technology; M. Sen, Enbridge Pipelines Inc.

- **11:30**  
  IPC2014-33659, Implementing a Geohazard Integrity Management Program Statistics and Lessons Learned Over 15 Years  
  A. Baumgard, T. Couttith, G. Ferris, BGC Engineering Inc.

**Session 6-4-1: Third Party Damage — Assessment**

**Session Chair:** Aaron Dinovitzer, BMT Fleet  
**Room:** TELUS Glen 209  
**Date:** Thursday, October 2  
**Time:** 08:30 - 12:00

- **13:30**  
  IPC2014-33499, Excavation Assistance System Design Based on Human Factors: Functional and Technical Analysis  
  M. Lecci, R. Perinet, G. Pognonec, N. Herchin, GDF SUEZ; T. Marmey, GRTgaz

- **14:00**  
  IPC2014-33034, Pipeline Plain Dent Fatigue: A Comparison of Assessment Methodologies  
  S. Cunha, Petrobras; I. Pasqualino; B. Pinheiro, COPPE/UFRJ

**Topic 6-4: Resident Threats**

**Session 6-4-2: Third Party Damage — Characterization**

**Session Chair:** Stephen Westwood, Baker Hughes Ltd.  
**Room:** HYATT Stephen  
**Date:** Friday, October 3  
**Time:** 08:30 - 12:00

- **08:30**  
  IPC2014-33071, Effect of Dent Depth on the Burst Pressure of NPS30 X70 Pipes with Dent-Crack Defect  
  H. Guedesna, S. Das, University Of Windsor; R. Wang, R. Karia, TransCanada Pipelines

**Session 6-4-3: Manufacturing Defects**

**Session Chair:** Gary Vervake, Spectra Energy  
**Session Co-Chair:** Steve Rapp, Spectra Energy  
**Room:** TELUS Glen 205  
**Date:** Thursday, October 2  
**Time:** 09:00 - 15:00

- **09:00**  
  IPC2014-33210, Structural Integrity of Steel Hydrocarbon Pipelines With Local Wall Distortions  
  A. E. Pournara, S. A. Karamanos, T. Papatheocharis; P. Peridianis, University of Thessaly

- **11:00**  
  IPC2014-33538, Experimental Investigation on Combined “Dent And Gouge” Defects on Vintage Steel Transmission Pipelines  
  M. Lecci, S. Hertz-Clemens, M. Polo, GDF SUEZ

- **11:30**  
  IPC2014-33445, Mechanical Damage and Fatigue Assessment of Dented Pipelines Using FEA  
  W. Han, S. Kenny, Memorial University of Newfoundland and Labrador

**Session 6-4-4: Study of Defects and Excavation Assistance System Characterization**

**Session Co-Chair:** Steve Rapp, Spectra Energy  
**Room:** TELUS Glen 205  
**Date:** Thursday, October 2  
**Time:** 09:00 - 15:00

- **09:00**  
  IPC2014-33065, Track Record of In-Line Inspection as a Means of ERW Seam Assessment in Response to NTSB Recommendation P-09-1, Arising From the Carmichael, MS Rupture  
  J. F. Kiefner, B. Nestleroth; Kiefner and Associates Inc.; J. A. Beavers, C. Maier, Det Norske Veritas (U.S.A.), Inc.

- **09:15**  
  IPC2014-33068, Types of Defects that Affect ERW Seam Integrity in Response to NTSB Recommendation P-09-1, Arising From the Carmichael, MS Rupture  
**Technical Tracks**

**Session 6-6-1: Pipeline Integrity Management Posters**

**Session Chair:** Mark Piazza, Colonial Pipeline Company

**Room:** TELUS Macleod Hall A

**Date:** Poster Session 1

**Tuesday, September 30, 15:30 - 17:30**

**Date:** Poster Session 2

**Wednesday, October 1, 09:00 - 10:15**

**IPC2014-33646, Fitness for Service of Dents Associated With Metal Loss due to Corrosion**

H. Olav Heggan, D. A. Kemp, J. Bratton, Jason L. Austin, J. Liu, Det Norske Veritas

**IPC2014-33400, Risk Assessment Procedures and Prioritization of Mitigation Actions in Pipeline Crossings**

V. Carlos Teixeira da Costa, E. L. de Paula, B. M. Gonçalves, D. S. Lima, Petrobras Transporte S.A.

**IPC2014-33744, Practical Applications of Bed Scour Calculations: Two Case Studies**

L. Burge, L. Chaput-Desrochers, R. Guthrie, SNC-Lavalin

**IPC2014-33060, Multiple Data Inspection of Hard Spots and Cracking**

A. Belanger, T. Barker, T. D. Williamson

**IPC2014-33395, Detection and Sizing of Subcritical Cracks Using Ultrasonic In-Line Inspection Methods**

H. Brueske, S. Bauer, ROSEN Technology and Research Center

**IPC2014-33600, Modelling Shallow Dents Using Local Regression Methods and Finite Element Analysis**

A. Lockey, G. Gonzalez, Penipan Ltd.; W. Santamaria, ExxonMobil

**IPC2014-33073, Small-Scale Testing to Characterize ERW Seam Properties in Response to NTSB Recommendation P-09-01, Arising From the Carnichael, MS Rupture**

G. T. Quicel, J. A. Beavers, Det Norske Veritas (U.S.A.); J. F. Kiefner, Kiefner and Associates Inc.; B. Leis, BN Leis Consultant Inc.

**IPC2014-33312, Effective Methods to Determine the Stress Intensity Factors for 2D and 3D Cracks**

X. Zhu, Edson Welding Institute; B. Leis, BN Leis Consultant Inc.

**IPC2014-33566, Allowable Pressure Cycling Limits for Liquid Pipelines**

A. C. Sutton, Y. Hubert, S. J. Haider, S. Textor, Enbridge Pipeline Inc.

**IPC2014-33226, Overview of a Comprehensive Study to Understand Longitudinal ERW Seam Failures**

B. Young, J. M. Smith, Battelle Memorial Institute; S. Nanney, U.S. DOT; B. Leis, BN Leis Consultant Inc.

**IPC2014-33485, Managing a New Pressure Cycling Reality in Liquid Pipelines**

S. J. Haider, S. Textor, Yvan Hubert, A. C. Sutton, Enbridge Pipeline Inc.

**IPC2014-33562, Development of Selective Seam Weld Coating Test Method**

J. A. Beavers, C. S. Brossia, R. Derzine, DNV USA Inc.

**IPC2014-33405, Advanced Techniques for Establishing Long-Term Performance of Composite Repair Systems**

C. Alexander, Stress Engineering Services Inc.

**IPC2014-33476, Pipeline Coating Selection Process—A Hybrid Multi-Criteria Based Approach**

S. Hassani, L. Krista, V. Vorontsov, Enbridge Pipeline Inc.

**IPC2014-33201, Design of Pipeline Composite Repairs: From Lab Scale Tests to FEA and Full Scale Testing**

R. Her, J. Renard, Y. Feury, Ecole Nationale Supérieure des Mines de Paris; V. Galfard, P. Wiet, Total SA

**IPC2014-33410, Pipeline Repair of Corrosion and Dents: A Comparison of Composite Repairs and Steel Sleeves**

C. Alexander, B. Vyvial, Stress Engineering Services Inc.; F. Wilson, Armor Plate Inc.

**IPC2014-33406, Multiple Data Inspection of Hard Spots and Cracking**

A. Belanger, T. Barker, T. D. Williamson

**IPC2014-33395, Detection and Sizing of Subcritical Cracks Using Ultrasonic In-Line Inspection Methods**

H. Brueske, S. Bauer, ROSEN Technology and Research Center

**IPC2014-33294, Investigation And Assessment Of Low-Frequency ERW Seam Imperfections By EMAT And CMFL ILI**

R. Karia, TransCanada Pipelines; R. Weber, ILI Consulting; S. Klein, Rosen Technology & Research Center

**IPC2014-33411, Pipeline Coating Selection Process—A Hybrid Multi-Criteria Based Approach**

S. Hassani, L. Krista, V. Vorontsov, Enbridge Pipeline Inc.

**IPC2014-333201, Design of Pipeline Composite Repairs: From Lab Scale Tests to FEA and Full Scale Testing**

R. Her, J. Renard, Y. Feury, Ecole Nationale Supérieure des Mines de Paris; V. Galfard, P. Wiet, Total SA

**IPC2014-33410, Pipeline Repair of Corrosion and Dents: A Comparison of Composite Repairs and Steel Sleeves**

C. Alexander, B. Vyvial, Stress Engineering Services Inc.; F. Wilson, Armor Plate Inc.

**IPC2014-33405, Advanced Techniques for Establishing Long-Term Performance of Composite Repair Systems**

C. Alexander, Stress Engineering Services Inc.

**IPC2014-33476, Pipeline Coating Selection Process—A Hybrid Multi-Criteria Based Approach**

S. Hassani, L. Krista, V. Vorontsov, Enbridge Pipeline Inc.

**IPC2014-33201, Design of Pipeline Composite Repairs: From Lab Scale Tests to FEA and Full Scale Testing**

R. Her, J. Renard, Y. Feury, Ecole Nationale Supérieure des Mines de Paris; V. Galfard, P. Wiet, Total SA

**IPC2014-33410, Pipeline Repair of Corrosion and Dents: A Comparison of Composite Repairs and Steel Sleeves**

C. Alexander, B. Vyvial, Stress Engineering Services Inc.; F. Wilson, Armor Plate Inc.

**IPC2014-33405, Advanced Techniques for Establishing Long-Term Performance of Composite Repair Systems**

C. Alexander, Stress Engineering Services Inc.
Session 7-1-2: Girth Weld Procedures Development 2  
Session Chair: Gordon Fredine, Enbridge Pipelines Inc.  
Room: TELUS Glen 203  
Date: Tuesday, September 30  
Time: 13:30 - 15:00

14:00  
S. Funderburk, CRC-Evans Pipeline International Inc.;  
P. Spielbauer, CRC-Evans Automatic Welding;  
Y. Chen, CRES;  
M. Quintana, Lincoln Electric Co

14:30  
IPC2014-33380, The Essential Welding Variable Approach and Its Application to the Welding of X80 Line Pipe Steels  
Y. Chen, CRES;  
J. Gianetto, Natural Resources Canada;  
Y. Sui, China Petroleum Pipeline Bureau;  
H. Jin, PR/CNPC;  
F. Fazeli, CarnefillMATERIALS

14:45  
IPC2014-33492, Girth Weldability Evaluation of Sawh Pipes Produced from 23.7 mm Thick, High-NB Containing X70 Linepipe Steel  
Ö. Gungor, M. Liebeherr, ArcelorMittal Global R&D Gent / OCAS NV;  
H. Luccioni, ArcelorMittal PCE

Session 7-1-3: In-service Welding & Heat Treatment (includes 2013 Rio Best Paper)  
Session Chair: Colin Dooley, Alliance Pipeline Room: TELUS Glen 265  
Date: Wednesday, October 1  
Time: 09:00 - 11:30

09:00  
IPC2014-33223, Under Pressure Welding and Preheat Temperature Decay Times on Carbon Dioxide Pipelines  
S. Slater, R. Andrews, P. Boothby, MACAW Engineering Ltd;  
J. Barnett, National Grid Carbon;  
K. Armstrong, GL Noble Denton

09:30  
IPC2014-33261, Development of In-Service Weld Repair Method for LS55(X80)-Grade Pipeline  
Y. Yano, M. Katsuki, T. Mayumi, Y. Ohtani, JFE Engineering Corporation;  
N. Oguchi, Tokyo Gas Co Ltd

10:00  
IPC2014-33645, Assessment of an Existing Hot Tap Connection on the Bord Gaís Eireann Brighouse Bay Gas Export Terminal  
P. Boothby, R. Andrews, S. Slater, MACAW Engineering Ltd;  
G. Canty, Bord Gaís Networks

10:30  
IPC2014-33374, Comparative Integrity Evaluation of Counterbore-Tapered and Back-Beveled Weld Joints  
M. Martens, TransCanada PipeLines;  
Y. Chen, M. Liu, CRES

11:00  
IPC2014-33464, Effects of High-low Misalignment on Girth Weld Integrity  
Y. Wang, K. Kotian, Center for Reliable Energy Systems;  
S. Rapp, Spectra Energy

Session 7-1-4: Girth Weld General 1  
Session Chair: Marie Quintana, Lincoln Electric Co Room: TELUS Glen 203  
Date: Wednesday, October 1  
Time: 08:30 - 10:00

8:30  
IPC2014-33430, Comparison Between Standard and Modified Back-Slotted DWTT Specimens  
D. Shih, M. Uddde, G. Wilkowski, Engineering Mechanics Corporation of Columbus;  
D. Duan, TransCanada PipeLines;  
J. Ferguson, TransCanada PipeLines

09:30  
IPC2014-33463, Experiments and Finite Element Model Results on the Deformation Response of an X80 Weld Zone  
Q. Puydt, M. Kulaiov, W. Poole, The University of British Columbia;  
L. Collins, S. Kenny, Evraz NA

11:30  
IPC2014-33731, Application of Weibull Stress Criterion to Brittle Fracture Assessment of HAZ-Notched Welds With Residual Stress  
Y. Seko, M. Mitsuya, Y. Imai, N. Oguchi, Tokyo Gas Co Ltd;  
F. Minami, Osaka University

Session 7-1-5: Girth Weld General 2  
Session Chair: Laurie Collins, Evraz North America Room: TELUS Glen 203  
Date: Wednesday, October 1  
Time: 10:30 - 12:00

10:30  
IPC2014-33551, Tandem Flux-Cored Arc Welding for High Strength Line Pipe  
C. Penniston, RMS Welding Systems;  
R. Huntley, RMH Welding Consulting

11:00  
IPC2014-33630, Application of Weibull Stress Criterion to Brittle Fracture Assessment of HAZ-Notched Welds With Residual Stress  
Y. Seko, M. Mitsuya, Y. Imai, N. Oguchi, Tokyo Gas Co Ltd;  
F. Minami, Osaka University

Session 7-1-6: Pipe & Plate Manufacturing 1  
Session Chair: Kevin Widenmaier, TransCanada Pipelines Limited Room: TELUS Glen 204  
Date: Tuesday, September 30  
Time: 10:30 - 12:00

10:30  
IPC2014-33099, Development of X90 and X100 Steel Grades for Seamless Linepipe Products  
D. Tomai, D. Nikisach, D. Main, A. Koka, Vallourec & Mannesmann Tubes Germany;  
S. Harksen, Vallourec Deutschland GmbH

11:00  
IPC2014-33150, Development of TMCP type Alloy625 / X65 clad plate for pipe  
S. Tachibana, Y. Kuronuma, T. Yokota, Y. Wada, H. Sueyoshi, S. Mitao, K. Yabumoto, Y. Moriya, M. Nagae, JFE Steel Corporation

11:30  
IPC2014-33265, Development and Production of Heavy Gauge X80 and High Strength X90 Pipe Line Steels Utilizing TMCP/Optimized Cooling Process  
G. Zhang, X. Bai, Cihuangdiao Shouqin Metal Materials Co., Ltd.;  
D. Stalheim, DGS Metallurgical Solutions, Inc.;  
S. Li, W. Ding, Shouyung Research Institute of Technology

Session 7-1-7: Pipe & Plate Manufacturing 2  
Session Chair: Nobuyuki Ishikawa, JFE Steel Corporation Room: TELUS Glen 204  
Date: Tuesday, September 30  
Time: 14:00 - 16:30

14:00  
IPC2014-33268, Development of API Grade Pipeline Steel With Improved Toughness on a Compact Strip Production (CSP) Line  
B. Frye, Y. Kendrick, M. Holtman, J. McClure, Gallatin Steel Company;  
D. Stalheim, DGS Metallurgical Solutions, Inc.

14:30  
IPC2014-33520, Measurement of Mechanical Properties on Line Pipe: Comparison of Different Methodologies  
S. Cooreman, D. Van Hoecke, ArcelorMittal Global R&D Gent;  
M. Liebeher, P. Thibaux, ArcelorMittal Global R&D Gent/OCAS NV;  
M. Yamaguchi Endrin, ArcelorMittal Flat Carbon Europe

15:30  
IPC2014-33321, Effects of UOE Manufacturing Process on Pressurized Bending Response of Offshore Pipes  
G. Chatzopoulos, S. Karamanos, University of Thessaly;  
G. Varelis, PDL Solutions (Europe) Ltd
**Session 7-1-8: Microstructure & Crack Propagation**

*Session Chair: Sanjay Tiku, BMT Fleet Technology Ltd*

*Room: TELUS Macleod Hall A*

*Date: Wednesday, October 1*

*Time: 08:30 - 10:00*

**ICPC2014-33341, Effects of Microstructural Inhomogeneity on HIC Susceptibility and HIC Evaluation Methods for Linepipe Steels for Sour Service**

K. Kim, S. Ko, J. Han, HYUNDAI STEEL COMPANY (Technical Research Center)

**ICPC2014-33388, Modern Approach to the Microstructure Characterization of Large Diameter Linepipes**

C. Stallybrass, M. Frommert, J. Konrad, Salzgitter Mannesmann Forschung GmbH; H. Meuser, Salzgitter Mannesmann Grobblech GmbH; J. Schroeder, Eurepipe GMBH


A. Gervasyev, I. Pyshmintsev, RosNITI; V. Camerlo Ohlka, R. Petcov, Ghent University; A. Arabey, Gazprom JSC

**ICPC2014-33715, Mass Production of X-80 Plate for Bovanenkovo Ukhta (Yamal-Europe) Gas Pipeline in Russia**

K. Eshnara, S. Sakamoto, T. Hara, N. Mamada, T. Adachi, Nippon Steel & Sumitomo Metal Corporation

**ICPC2014-33655, Qualification Testing of Mechanical Pipe Joining Method**

D. McColl, CORE Linepipe; A. Whiting, C-FER Technologies

**ICPC2014-33122, An Evaluation Procedure for Crack Driving Forces in Mismatched Welds and its Applicability to ECA Analysis of Undermatched Clad Pipe Girth Welds**

R. Souza, C. Ruggieri, University of São Paulo

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**Session 7-1-9: Pipeline Manufacturing & Welding Posters**

*Session Chair: Mark Piazza, Colonial Pipeline Company*

*Room: TELUS Macleod Hall A*

*Date: Poster Session 1 - Tuesday, September 30, 15:30 - 17:30*

*Date: Poster Session 2 - Wednesday, October 1, 09:00 - 10:15*

**ICPC2014-33696, Geometric Analysis of Pipeline Elbows through Reverse Engineering and Their Associated Imperfections**

M. Karat, C. Cakiroglu, S. Adeeb, R. Cheng, University of Alberta; M. Martens, TransCanada Pipelines

**ICPC2014-33082, Study on Defect Formation Mechanisms in ERW for API Steel**

M. Shin, J. Han, Hyundai Steel; Y. Lee, H. Kang, Husteel

**ICPC2014-33206, Recent Development of HFW Linepipe With a High-Quality Weld Seam Suitable for Sour Service Environments**

S. Toyoda, S. Sato, Y. Kato, S. Nabumoto, A. Sato, JFE Steel Corporation

**ICPC2014-33301, Examinations Regarding the Sour Gas Resistance of Girth Welds Carried Out on API Grade X80 Seamless Pipe Steel (Heavy Wall)**

D. Toma, D. Niklasch, A. Koka, Vallourec & Mannesmann Tubes Germany; J. Weibe, Salzgitter Mannesmann Forschung GmbH

**ICPC2014-33372, Mass Production of X-80 Plate for Bovanenkovo Ukhta (Yamal-Europe) Gas Pipeline in Russia**

K. Eshnara, S. Sakamoto, T. Hara, N. Mamada, T. Adachi, Nippon Steel & Sumitomo Metal Corporation

**ICPC2014-33668, A New Approach Using EBSD to Quantitatively Distinguish Complex Transformation Products Along the HAZ in X80 Linepipe Steel**

J. Reichert, M. Mittwer, W. Pockio, The University of British Columbia; L. Collins, Enirz North America

**ICPC2014-33254, Microstructure and Toughness of Simulated Grain Coarsened Heat Affected Zones in X80 Pipe Steels**

G. Gannele, Natural Resources Canada; Y. Chen, C-IPES; B. Shachi Amirkhiz, F. Fazeli, T. Smith, CanmetMATERIALS


Z. Yan, Y. Huang, W. Zhou, University of Western Ontario

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**Topic 7-2: Crack Propagation & Arrest**

**Session 7-2-1: Low-Constraint Fracture Toughness Testing with SENT Specimens**

*Session Chair: Da-Ming Duan, TransCanada Pipelines Limited*

*Room: TELUS Glen 203*

*Date: Thursday, October 2*

*Time: 08:30 - 10:00*

**ICPC2014-33251, Practical Application of Low Constraint SENT Fracture Toughness Testing for Pipeline Girth Welds**

P. Schamuhn Kik, V. Chum, SGS Ludwig Associates Engineering Ltd

**ICPC2014-33449, Mode Mixity in the Fracture Toughness Characterization of HAZ Material Using SEN(T) Testing**

S. Kalayanam, Y. Hoo, D. Shin, G. Wilkowski, Engineering Mechanics Corp. Columbus

**ICPC2014-33718, Development of Fracture Toughness Evaluation Using SENT Specimens**

X. Zhu, T. McGaughy, Edison Welding Institute

**Session 7-2-2: Drop Weight Tear Testing (DWTT) for Modern Pipeline Steels**

*Session Chair: Derrick Sarafinchan, Ludwig Associates Engineering Ltd.*

*Room: TELUS Glen 203*

*Date: Thursday, October 2*

*Time: 10:30 - 12:00*

**ICPC2014-33133, An Updated Fracture Resistance Dataset of Pipeline Ductile Fracture Propagation Based on High Speed DWTT Tests**

D. Duan, J. Zhou, TransCanada Pipelines; J. Ferguson, TransCanada Pipelines; M. Uddin, D. Shin, Engineering Mechanics Corporation of Columbus

**ICPC2014-33334, Effects of Notch Type and Loading Rate on CTOA of Modern X65 and X70 Pipe Steels**

S. Xu, J. Sollen, J. Liang, R. Zavadil, W. Tyson, CanmetMATERIALS

**ICPC2014-33476, Inverse Fracture: What is it All About?**

A. Hasenhütl, Salzgitter Mannesmann Forschung GmbH; M. Erdelen-Peppler, Salzgitter Forschung GmbH; C. Kalwa, EUROPipe GmbH
Technical Tracks

Session 7-2-3: Full-Scale Fracture Propagation & Arrest Tests & Analysis for Gas Pipelines
Session Chair: Andrew Cosham, Atkins
Room: TELUS Glen 203
Date: Thursday, October 2
Time: 13:30 - 15:00

13:30
IPC2014-33080, Analysis of Two Dense Phase Carbon Dioxide Full-Scale Fracture Propagation Tests
A. Cosham, Atkins; D. Jones, Pipeline Integrity Engineers; K. Armstrong, D. Alasan, GL Noble Denton; J. Barnett, National Grid Carbon

14:00
IPC2014-33326, Full Gas Burst Test for HFW Linepipe at Low Temperature
S. Igi, Y. Yabunoto, JFE STEEL CORPORATION; M. Mitsuwa, Tokyo Gas Co.; Y. Sumikura, OSAKA GAS CO., LTD.; M. Takeuchi, TOHO GAS Co., Ltd.

14:30
IPC2014-33514, Brittle Fracture Arrest in High Charpy Energy Steels: Comparisons With Some Existing Data

Session 7-2-4: Fracture Arrest Prediction Methods for Modern Pipeline Steels
Session Chair: Gery Wilkowski, Engineering Mechanics Corp
Room: TELUS Glen 203
Date: Thursday, October 2
Time: 15:30 - 17:00

15:30
IPC2014-33121, Review of Fracture Control Technology for Gas Transmission Pipelines
X. Zhu, Edson Welding Institute

16:00
IPC2014-33164, Establishing the Correlation Between Charpy Impact Energies for Different Sized Specimens of Modern Pipeline Steels
A. Norin, Salzgitter Mannesmann Forschung GmbH; H. Brauer, Salzgitter Mannesmann Line Pipe GmbH

16:30
IPC2014-33168, How to Assure Fracture Propagation Control for Seamless Gas Pipelines?
A. Norin, Salzgitter Mannesmann Forschung GmbH; M. Erdelen-Peppler, Salzgitter Forschung GmbH; W. Wessel, D. Mohr, V&M DEUTSCHLAND GmbH; S. Harsen, Vallourec Deutschland GmbH

Session 7-2-5: Finite Element Models for Simulating Ductile Cracks & Propagation
Session Chair: Sreekanta Das, University of Windsor
Room: TELUS Glen 204
Date: Thursday, October 2
Time: 08:30 - 10:00

08:30
IPC2014-33047, A Strain Rate-Dependent Finite Element Model of Drop-Weight Tear Tests for Pipeline Steels
P. Yu, C. Ru, University of Alberta

09:00
IPC2014-33440, Bulging Factor for Axial Surface Cracks in Pipes
D. Shim, G. Wilkowski, Engineering Mechanics Corp. of Columbus

09:30
IPC2014-33709, Numerical Model For Unstable Ductile Crack Propagation/Arrest In Natural Gas Pipelines Incorporating Soil Backfill Effect
H. Nakai, S. Aihara, The University of Tokyo; K. Misawa, NIPPON STEEL & SUMITOMO METAL CORPORATION

Session 7-2-6: Material Tensile & Fracture Tests & Evaluations
Session Chair: Tom Bubenik, DIV GL
Room: TELUS Glen 204
Date: Thursday, October 2
Time: 10:30 - 14:00

10:30
IPC2014-33042, Correlation of Fracture Behavior in Circumferentially Cracked Pipes and Fracture Specimens Including Ductile Tearing
D. Sarzosa, C. Ruggieri, University of Sao Paulo

11:00
IPC2014-33373, Critical Condition for Hydrogen Induced Cold Cracking of High Strength Weld Metal
N. Ishikawa, H. Sueyoshi, S. Endo, JFE Steel Corporation

IPC2014-33553, Effect of Chemistry on the Fracture Toughness of Low Carbon X70 Girth Weld Heat Affected Zone
M. Rashid, L. Collins, Y. Bian, Evraz NA

13:30
IPC2014-33684, Best Practices for Yield Stress Determination Using the Flattened Strap Tensile Test
L. Collins, M. Rashid, Evraz North America

Session 7-2-7: Crack Propagation & Arrest Posters
Session Chair: Mark Piazza, Colonial Pipeline Company
Room: TELUS Macleod Hall A
Date: Poster Session 1
Tuesday, September 30, 15:30 - 17:30
Date: Poster Session 2
Wednesday, October 1, 09:00 - 10:15

IPC2014-33143, Re-examination of Battelle Two Curve Method
C. Lu, G. Michal, A. Godbole, University of Wollongong; P. Venton, Venton & Associates Pty Ltd; L. Fletcher, Welding and Pipeline Integrity

IPC2014-33457, The Misconception of Employing CVN Toughness as Key-Measure in Crack Arrest Prediction For Modern Line-Pipe Steels
A. Voelling, M. Erdelen-Peppler, Salzgitter Mannesmann Forschung GmbH; C. Kalwa, EUROPIPE GmbH

IPC2014-33141, Mechanical Integrity Evaluation of Unequal Wall Thickness Transition Joints in Transmission Pipeline
X. Huo, S. Kenny, Memorial University of Newfoundland; M. Martene, TransCanada Pipelines

IPC2014-33712, Relationship Between J and CTOD in SE(T) and SE(B) Specimens for Stationary and Growing Cracks
D. Sarzosa, C. Ruggieri, University of Sao Paulo

Track 8: Operations & Maintenance
Track Chair: Robert Hadden, Kinder Morgan Canada
Track Co-Chair: Mark Leir, BGC Engineering Inc.
Track Sponsor: B.C. Oil & Gas Commission

Topic 8-1: Operations & Maintenance

Session 8-1-1: Natural Gas Pipelines
Session Chair: Bryan Balmer, Fortisbc Energy Inc.
Room: TELUS Macleod E3
Date: Tuesday, September 30
Time: 10:30 - 12:00

10:30
IPC2014-33320, Implementing an Algorithm and Training the Console Operators of the TRANSPETRO Integrated Gas Pipeline Networks for Decision-Making in Scenarios of High Psychological Pressure
E. Merson, P. Bruno Peres, M. Fonseca, A. Santos, A. Pinovilla, PETROBRAS TRANSPETRO S.A. - TRANSPETRO
Past page content: Technical Tracks

11:00
IPPC2014-33932, Conditioning TRANSPETRO’s Gas Pipeline Network to the Baia de Guanabara LNG Terminal New Regasification Profile
P. Krause, PUC-Rio/SIMDUT; D. Figueiredo dos Santos, R. Jardim, M. Bruno Bianchi Carnevale, Transpetro

11:30
IPPC2014-33590, Maintenance of Gas Pipeline Automatic Block Valves
T. Botelho Cruz, M. Novales, J. Paulo Leite, Petrobras Transporte S.A. Transpetro

Session 8-1-2: Pipeline Facilities
Session Chair: Mark Leir, BGC Engineering Inc.
Room: TELUS Macleod E3
Date: Tuesday, September 30
Time: 13:30 - 15:00

13:30
IPPC2014-33350, Validation and Verification of Complex Pipeline Terminal Station
F. Lin, Enbridge Pipelines Inc.; A. Chegus, D. Cernelev, Stream Systems Incorporated

14:00
IPPC2014-33023, Methods for Determining the Amount of Hydrates Formed During Blowdown of Natural Gas Compressor Station
Y. Beauregard, K. Botros, NOVA Research and Technology Center

14:30
IPPC2014-33022, Dynamics of the Recycle Systems of Two Centrifugal Compressors Operating in Series in a Natural Gas Compressor Station
K. Botros, NOVA Research and Technology Center; B. Ruggiero, M. Szwarz, C. Ho, TransCanada Pipelines

Session 8-1-3: Pipeline Repair
Session Chair: Laura Seto, Enbridge
Room: TELUS Macleod E3
Date: Tuesday, September 30
Time: 15:30 - 17:00

15:30
IPPC2014-33618, Pipeline Mechanical Damage Excavation Process Review and Recommendations
A. Faded, J. Dinnizter, S. Tiku, BMT Fleet Technology; G. Vignal, Enbridge Pipelines Inc.

16:00
IPPC2014-33087, Safe and Successful Isolations and Interventions
S. Gower, D. Allen, BP Exploration

16:30
IPPC2014-33596, Using HPIR Class Composite Pipeline Systems to Overcome the Challenges of Rehabilitating or Replacing a Pipeline Across a Navigable Waterway and Environmentally Sensitive Wetlands

Session 8-1-4: Pipeline System Modelling
Session Chair: Rich Chan, Kinder Morgan Canada
Room: TELUS Macleod E3
Date: Wednesday, October 1
Time: 10:30 - 11:30

10:30
IPPC2014-33349, Application of Multi-Nodal Network Simulation Model in Debottlenecking Complex Pipeline Network
D. Cernelev, A. Chegus, Stream Systems Incorporated; F. Lin, Enbridge Pipelines Inc.

11:00
IPPC2014-33431, Application of Probabilistic Methods for Predicting the Remaining Life of Offshore Pipelines
A. Aljaroudi, A. Akinturk, F. Khan, Memorial University; P. Thodi, M. Paulin, INTECSEA Canada / WorleyParsons Group

Session 8-1-5: Liquids Pipelines
Session Chair: David Feser, Kinder Morgan Canada
Room: TELUS Macleod E3
Date: Wednesday, October 1
Time: 08:30 - 10:00

08:30
A. Malekpour, B. Karney, University of Toronto

09:00
IPPC2014-33304, Pipelining Fengcheng Extra Heavy Oil over Long Distance by Dilution and Heating
D. Deng, Y. Wang, China University of Petroleum; J. Sun, X. Liu, D. Zeng, Oil & Gas Storage and Transportation Branch, Xinjiang Oilfield Company

9:30
IPPC2014-33309, Under Pressure Operations on Dense Phase CO2 Pipelines: Issues for the Operator
J. Barnett, National Grid Carbon; A. Kirkham, National Grid; K. Armstrong, GLND; R. Wilkinson

Session 8-1-6: Operations Programs & Systems
Session Chair: Karl Blank, Enbridge Pipelines Inc.
Room: TELUS Macleod E3
Date: Thursday, October 2
Time: 08:30 - 10:00

08:30
IPPC2014-33217, Condition-Based Optimal Maintenance Decision Modeling for Corroding Natural Gas Pipelines
S. Zhang, T. Huang, S. Kariyawasam, TransCanada Pipelines; W. Zhou, Western University

09:00
IPPC2014-33573, The Application of Lean Six Sigma Methodology in Execution Process, Management and Attribution of Maintenance Activities
R. Souza, T. Cardoso, V. José Campitelli Real, Transpetro; L. Gonçalves Tomaz, Petrobras Transporte S.A. Transpetro

Session 8-1-7: Operations & Maintenance Posters
Session Chair: Mark Piazza, Colonial Pipeline Company
Room: TELUS Macleod Hall A
Date: Poster Session 1
Tuesday, September 30, 15:30 - 17:30
Date: Poster Session 2
Wednesday, October 1, 09:00 - 10:15

IPPC2014-33007, Experimental Investigation of Wax Deposition at Different Deposit Locations Through a Detachable Flow Loop Apparatus
S. Li, Q. Huang, W. Wang, C. Wang, China University of Petroleum; Z. Ding, Trans-Asia Gas Pipeline Company Limited

IPPC2014-33064, Identifying Optimal Pigging Frequency for Oil Pipelines Subject to Non-Uniform Wax Deposition Distribution
W. Wang, Q. Huang, S. Li, C. Wang, X. Wang, China University of Petroleum

IPPC2014-33429, Identification Method of Oil Pipelines Technical Condition Based Upon Multigraph Models
A. Vlaicu, CCO NII TNM
Track 9: Pipeline Automation & Measurement

Track Chair: Renan Martins Baptista, Petrobras R&D Centre
Track Co-Chair: Ray Philipenko, Enbridge Pipelines Inc.
Track Sponsor: Saskatchewan Ministry of the Economy

Topic 9-1: Pipeline Automation & Measurement

Session 9-1-1: Pipeline Leak Detection

Session Chair: Ron Threlfall, Enbridge Pipelines Inc.
Session Co-Chair: Gary Ng, Enbridge Pipelines Inc.
Room: HYATT Doll/Herald
Date: Thursday, October 2
Time: 08:30 - 17:00

08:30
IPC2014-33652, Laboratory and Numerical Simulations of Pipeline Leakage Behaviour: Volatile Organic Compound (VOC) Migration Through Porous Media and Subsequent Atmospheric Dispersion
J. Brydie, S. Trottier, A. Jafari, Alberta Innovates - Technology Futures (AITF); T. Rizwan, M. Derakhshesh, Enbridge Pipelines Inc.

09:00
IPC2014-33495, Leak Detection Using Distributed Temperature Sensing: An Improved Calculation Method
P. Skoczylas, T. Dessein, C-FER Technologies; T. Rizwan, S. Medynski, Enbridge Pipelines Inc.

09:30
S. Chadha, D. Hung, S. Rashid, Enbridge Pipelines Inc.

10:30
IPC2014-33495, Leak Detection Using Distributed Temperature Sensing: An Improved Calculation Method
P. Skoczylas, T. Dessein, C-FER Technologies; T. Rizwan, S. Medynski, Enbridge Pipelines Inc.

11:00
IPC2014-33297, A Combined Leak Detection Method Using Pattern Recognition Techniques
G. Geiger, Westphalian University; D. Vogt, Krohne Oil and Gas B.V.

11:30
IPC2014-33719, Dual Threshold Analysis and Its Tuning Tool Development for Leak Detection
J. Gao, M. Chen, Enbridge Pipeline Inc.

13:30
IPC2014-33459, Automated Test System for Monitoring the Efficacy and Reliability of Leakage Detection in Pipelines
D. Inaudi, R. Walder, SMARTEC SA

14:00
IPC2014-33375, External Pipeline Leak Detection Based on Fiber Optic Sensing for the Kinosis 12”-16” and 16”-20” Pipe-in-Pipe System
C. Borde, D. Dutot, M. Nikles, Omnisens; H. Duncan, Nexen

14:30
IPC2014-33062, Enhancing Liquid Hydrocarbon Pipeline Leak Detection Using Instrumented Aerial Surveillance
A. Banica, B. Tilton, Synodixon Inc.; D. Wassen, Suncor Energy

15:30
IPC2014-33661, Formulation and Analysis of the Probability of Detection and False Detection for Subsea Leak Detection Systems
A. Aljaroudi, F. Khan, A. Akinturk, M. Haddara, Memorial University of Newfoundland; P. Thodi, INTECSEA Canada - Worley Parsons Group

16:00
IPC2014-33725, Characterization of Thermal and Acoustic Profiles of Potential Underwater Pipeline Leaks
S. Siebenaler, E. Tervo, Southwest Research Institute; M. Kulkarni, ExxonMobil; S. Patni, Shell Upstream; G. Gesoff, BP

16:30
IPC2014-33612, Triggers for the Transient State of a Pipeline in Material Balance Systems Used in Real-Time Transient Hydraulic Modeling
N. Rostamy, N. Okungbowa, Enbridge Pipelines Inc.; J. Yurchevich, Foster Wheeler Upstream

Session 9-1-2: Hydraulic Simulations & Real Time Advanced Functions

Session Chair: Paul Vinh, Enbridge Pipelines Inc.
Room: HYATT Doll/Herald
Date: Wednesday, October 1
Time: 08:30 - 11:30

08:30
IPC2014-33565, Numerical Simulation of Stratified Two-Phase Flow in a Nearly Horizontal Gas-Liquid Pipeline with a Leak
D. Bueno, A. Figueredo, G. Boststein, Federal University of Rio de Janeiro (UFRJ); R. Martins Baptista, Petrobras R&D Centre; F. Rachid, Fluminense Federal University (UFF)

09:00
IPC2014-33061, Economic Feasibility of Transporting Natural Gas Hydrates in Slurry Pipelines
K. Botros, NOVA Research and Technology Center; S. Hall, TransCanada Pipelines

09:30
K. Botros, C. Hartloper, NOVA Research and Technology Center (NOVA Chem); L. Jansen, A. Tee, TransCanada Pipelines

10:30
IPC2014-33153, Consideration of Line-Pack Flexibility in Dynamic Steady-State Simulations for Natural Gas Transport Networks
K. Münch, H. Körner, A. Moser, RWTH Aachen University

11:00
N. Okungbowa, N. Rostamy, Enbridge Pipelines Inc.

Session 9-1-3: SCADA, Automation & Instrumentation

Session Chair: Dion Dube, Enbridge Pipelines Inc
Room: HYATT Doll/Herald
Date: Friday, October 3
Time: 09:00 - 10:00

09:00
IPC2014-33193, Scada and Gas Management System (GMS) Virtualization, an Effort To Improve Optimization, Reliability and Business Continuity for PT Pertamina Gas
A. Wesianto, Pertamina
09:30
IPC2014-33398, Real-Time Pig Tracking Using a Fibre Optic Pipeline Monitoring System
R. Espiner, BP Exploration; A. Pickburn, OneSubsea

Session 9-1-4: Measurement & Metering
Session Chair: Richard Turner, Enbridge Pipelines Inc.
Session Co-Chair: Samir Rashid, Enbridge Pipelines Inc.
Room: HYATT Doll/Herald
Date: Friday, October 3
Time: 10:30 - 11:30

10:30
IPC2014-33019, Measurements and Evaluation of Internal Wall Surface Roughness of Small Diameter Pipes for High Pressure Natural Gas Systems
K. Botros, C. Hartloper, J. Geerligs, NOVA Research and Technology Center (NOVA Chem); H. Golshan, TransCanada Pipelines; K. Jensen, ATCO Pipelines

11:00
IPC2014-33536, Petrobras Transporte S. A.: Transpetro’s Ultrasonic Flow Meter Recalibration Program
T. Carvalho, A. Luisa Ferreira, T. Lourenco, Petrobras Transporte S.A.

Session 9-1-5: Pipeline Automation & Measurement Posters
Session Chair: Mark Piazza, Colonial Pipeline Company
Room: TELUS Macleod Hall A
Date: Poster Session 1
Tuesday, September 30, 15:30 - 17:30
Date: Poster Session 2
Wednesday, October 1, 09:00 - 10:15

IPC2014-33026, Leakage Detection and Location in Compressible Flow in a Pipeline
H. Emara-Shabaik, D. Adair, Nazarbayev University; M. Jaeger, University of Tasmania

IPC2014-33083, Pipeline Leak Detection Using Four Mode Fibre-Optic Based Distributed Sensing
D. Hill, C. Minto, A. Godfrey, J. Williams, J. Worsey, OptaSense Ltd

IPC2014-33115, Direct Hydrocarbon Leakage Detection of Pipelines Using Novel Carbon Nanotube Nanocomposites
K. Parmar, S. Park, University of Calgary

IPC2014-33298, Pipeline Leak Detection Technologies and Emergency Shutdown Protocols
G. Geiger, Westphalian University

IPC2014-33443, Fast Detection and Localization of Small Leaks in Toxic Pipelines Using Distributed Fibre Optic Sensors
D. Fraudi, R. Waldor, SMARTEC SA; R. de Bont, Yara

IPC2014-33557, Field Testing of Negative-Wave Leak Detection Systems
S. Siebenaler, E. Tervo, Southwest Research Institute; P. Virth, C. Lewis, Enbridge Pipelines Inc.

IPC2014-33570, Effects of Data Preparation on Leak Sensitivity Analysis
R. Noguerol, A. Acevedo, Energy Solutions Intl.; J. Urniza, Ecopetrol S.A.

IPC2014-33579, Large Scale Test Apparatus to Test External Leak Detection Technologies
C. Apsy, C.FER Technologies; I. Ozkan, National Research Council Canada; T. Rowan, M. Derakhshesh, S. Medynski, Enbridge Pipelines Inc.

IPC2014-33619, Development of Pipeline Leak Detection Technologies
J. Zhang, A. Hoffman, A. Kane, J. Lewis, ATMOS International

IPC2014-33031, Modulating Pressure Setpoints in Pipeline Pressurizing
H. Honda Federico, C. Garcia, Petrobras Transporte S.A.; TRANSPETRO

IPC2014-33031, Benefits and Methods of Automating Surge Relief Valves
J. Konopa, K. Konopa, Liquid Meter Company Inc.

IPC2014-33085, Considerations for Hydrodynamic Slug Analysis in Pipelines
D. Galatro, F. Marin-Cordero, D. Fuhrbauer, D. Nerucci, ILF Consulting Engineers; X. Hu, Technische Universität München

IPC2014-33257, Research of Gas Losses During Transportation in Gas Transmission Trunk Line
R. Chen, X. Xing, X. Tian, China University of Petroleum; L. Jiang, China National Oil and Gas Exploration and Development Corporation; S. Pang, Trans-Asia Gas Pipeline Company Limited

IPC2014-33258, Calculation Method of Natural Gas Compressibility Factor and its Application in Pipeline Trade
X. Tian, X. Xing, L. Yang, China University of Petroleum at Beijing; S. Pang, Trans-Asia Gas Pipeline Company Limited

Z. Wang, J. Gong, H. Wu, China University of Petroleum at Beijing; Q. Li, CNOOC Research Institute

IPC2014-33758, Dynamic Testing
J. Smith, R. Kalivoda, N. Gailey, FMC Technologies

Track 10: Pipelining in Northern & Offshore Environments
Track Chair: Shawn Kenny, Carleton University
Track Co-Chair: Ken Macdonald, Statoil
Track Sponsor: UniversalPegasus

Topic 10-1: Pipelining in Northern & Offshore Environments

Session 10-1-1: Design Issues
Session Chair: Shawn Kenny, Carleton University
Session Co-Chair: Ken Macdonald, Statoil
Room: TELUS Glen 208
Date: Tuesday, September 30
Time: 10:30 - 12:00

10:30
IPC2014-33078, Corrosion Protection of a Pipeline Section Inside an HDD Coastal Landfall
B. Antunes, B. Cunha, M. Genaio, PETROBRAS - Petroleso Brasileiro S.A.; E. Santana-Diaz, M. Gouriou, SAIPEM S.p.A
**Technical Tracks**

**11:00**
IPC2014-33084, Evaluation of Design Premises and Uncertainties on the Thermo-Mechanical Behavior of a Subsea Pipeline
B. Artunes, R. Familiar Solano, A. Santos Hansen, PETROBRAS - Petroleio Brasileiro S.A.

**11:30**
IPC2014-33314, Development of Distributed Fiber Optic Sensors for Offshore Pipeline Leak Detection
M. Kukarni, S. Shaftova, ExxonMobil; A. Rinjhart, ExxonMobil Upstream Research Company

**Session 10-1-2: Offshore Pipelines & Risers**
Session Chair: Shawn Kenny, Carleton University
Session Co-Chair: Ken Macdonald, Statoil
Room: TELUS Glen 208
Date: Tuesday, September 30
Time: 13:30 - 16:00

**13:30**
IPC2014-33161, Impact of Small-Scale Reeling Simulation on Mechanical Properties on Line Pipe Steel
K. Christoph Melwes, Salzgitter Mannesmann Forschung GmbH; M. Erdelen-Peppler, Salzgitter Forschung GmbH; H. Brauer, Salzgitter Mannesmann Line Pipe GmbH

**14:00**
IPC2014-33163, Full-Scale Reeling Tests of HFI Welded Line Pipe for Offshore Reel-Laying Installation
K. Christoph Melwes, S. Höhler, Salzgitter Mannesmann Forschung GmbH; M. Erdelen-Peppler, Salzgitter Forschung GmbH; H. Brauer, Salzgitter Mannesmann Line Pipe GmbH

**14:30**
R. Amarasinghe, D. Wijewickreme, University of British Columbia; H. Eid, Qatar University

**15:30**
IPC2014-33736, A Review of Construction Experience With AUT of Girth Welds in Clad Linepipe
I. Macdonald, Subsea 7 Norway AS; K. Macdonald, Statoil ASA

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**Track 11:**
**Strain-Based Design**
Track Chair: Joe Zhou, TransCanada Pipelines Limited
Track Co-Chair: Yong-Yi Wang, CRES
Track Co-Chair: Ming Liu, CRES
Track Sponsor: Centre for Reliable Energy Systems (CRES)

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**Topic 11-1: Strain Based Design**

**Session 11-1-1: Strain Based Design Framework & Project**
Session Chair: Joe Zhou, TransCanada Pipelines Limited
Room: TELUS Glen 205
Date: Tuesday, September 30
Time: 10:30 - 12:00

**10:30**
IPC2014-33421, Strain-Based Pipeline Design in Harsh Environments Using Large Diameter High Strain Line Pipes
N. Suzuki, PIN Technologies Corporation; T. Arakawa, JFE Steel Corporation; A. Arabey, Gazprom JSC

**11:00**
IPC2014-33550, A Case Study in High Strain Capacity Pipeline Qualification: PNG LNG Project
F. Noecker II, D. Fairchild, Exxonmobil Upstream Research Company; A. Arabey, Gazprom JSC; D. Cook, M. Macia, W. Kan, ExxonMobil Development Company

**11:30**
IPC2014-33745, Overall Framework of Strain-Based Design and Assessment of Pipelines
Y. Wang, M. Liu, CRES; D. Horley, Horley Consulting Ltd.; M. Salama, Conoco Phillips; M. Sen, Enbridge Pipelines Inc.

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**Session 11-1-2: Strain Demand**
Session Chair: Fan Zhang, Center For Reliable Energy Systems
Session Co-Chair: James Hart, SSD Inc
Room: TELUS Glen 205
Date: Tuesday September 30
Time: 13:30 - 15:00

**13:30**
IPC2014-33318, Use of Discrete Element Modeling to Capture the Effect of Backfill Particle Size on the Soil Restraints of Buried Pipelines Subjected to Lateral Ground Movement
S. Dilrukshi, D. Wijewickreme, University of British Columbia

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**Session 11-1-3: Material Properties & Toughness Testing**
Session Chair: Timothy Weeks, NIST
Session Co-Chair: William Tyson, CarmentMATERIALS
Room: TELUS Glen 209
Date: Tuesday, September 30
Time: 10:30 - 15:00

**10:30**
IPC2014-33046, Prediction of the Mechanical Properties of UOE Pipes for Strain-Based Application

**11:00**
IPC2014-33484, Ductile Fracture Behavior of Bainite-MA Dual-Phase Steels
J. Shimamura, K. Yasuda, N. Ishikawa, S. Endo, JFE Steel Corporation

**11:30**
IPC2014-33233, Fracture Toughness of X70 Pipe Girth Welds Using Clamped SE(T) and SE(B) Single-Specimens
D. Park, J. Gravel, H. Smith, J. Liang, CarmentMATERIALS; N. Suzuki, PIN Technologies; D. Duan, TransCanada Pipelines

**13:30**
IPC2014-33571, Determination Of CTOD Resistance Curves In SENT Specimens With a Tilted Notch
K. Van Minnebruggen, R. Derys, W. De Waele, Ghent University; M. Verstraete, Soete Laboratory-Ghent University; P. Thibaux, ArcelorMittal Global R&D Gent, OCAS NV

**14:00**
IPC2014-33695, Direct Comparison of Single-Specimen Clamped SE(T) Test Methods on X100 Line Pipe Steel
T. Weeks, NIST; E. Lucon, PROTIRO Inc.
14:30
IPC2014-33690, Curved-Wide Plate Testing of X100 Girth Welds
T. Weeks, J. McColliskey, M. Richards, NIST; Y. Wang, CRES; M. Quintana, Lincoln Electric Co

Session 11-1-4: Compressive Strain Capacity
Session Chair: Ming Liu, CRES
Session Co-Chair: Shawn Kenny, Carleton University
Room: TELUS Glen 209
Date: Wednesday, October 1
Time: 08:30 - 11:30

08:30
IPC2014-33202, Refined Modeling Processes and Compressive Strain Capacity Models
M. Liu, CRES; F. Zhang, K. Kotian, Center For Reliable Energy Systems; S. Narrey, U.S. DOT - Pipeline and Hazardous Materials Administration

09:00
IPC2014-33231, Bending Deformation Capacity of Large-Diameter Spiral Welded Tubes
D. Vasilikis, S. Karamanos, University Of Thessaly; S. Van Es, A. Gresnigt, Delft University of Technology

10:30
IPC2014-33468, Effect of Girth Welding on Strain Capacity of X80 SAW Pipes
H. Shitamoto, E. Tsuru, H. Nagayama, Y. Nishi, Nippon Steel & Sumitomo Metal Corporation

11:00
IPC2014-33454, Effects of Weld Strength Heterogeneity on Crack Driving Force in Stress and Strain Based Design Scenarios
S. Hertelé, K. Van Minnebruggen, W. De Waee, Gent University; N. O'Dowd, University of Limerick; M. Verstraete, Soete Laboratory-Ghent University

IPC2014-33711, Application of Tensile Strain Models to Multiple Grades of Pipelines
W. Wei Zhang, Z. Zhang, P. Yang, J. Zhang, China Petroleum Pipeline Engineering Corporation

IPC2014-33582, Evaluation of Pressurized Cold Bend Pipe Body Tensile Fractures Under Bending Loads
C. Cakiroglu, M. Kainat, S. Adeeb, R. Cheng, University of Alberta; M. Sen, Enbridge Pipelines Inc.

Session 11-1-5: Tensile Strain Capacity
Session Chair: Yong-Yi Wang, CRES
Session Co-Chair: Satoshi Igi, JFE STEEL CORPORATION
Room: TELUS Glen 209
Date: Thursday, October 2
Time: 09:00 - 11:30

09:00
IPC2014-33432, Ductile Crack Extension Analysis for X80 Bending Deformation Using Damage-based Model
M. Ohata, Osaka University; S. Igi, T. Sakimoto, K. Oi, J. Kondo, JFE Steel Corporation

09:30
IPC2014-33589, Enhancing Tensile Strain Capacity through the Optimization of Weld Profiles
Y. Wang, Y. Chen, CRES; M. Salama, Conoco Phillips

10:30
IPC2014-33748, Full-Scale Testing for Strain-Based Design Pipelines: Lessons Learned and Recommendations

IPC2014-33749, Strain Capacity Prediction of Strain-based Pipelines

Track 12: Risk & Reliability
Track Chair: Maher Nessim, C-FER Technologies
Track Co-Chair: Richard Espiner, BP
Track Co-Chair: Danielle Demers, Alliance Pipeline
Track Sponsor: The National Energy Board of Canada & The US Pipeline and Hazardous Materials Safety Administration

IPC2014-33680, Application of Compressive Strain Capacity Models to Multiple Grades of Pipelines
Z. Zhang, Z. Yu, China Petroleum Pipeline Engineering Corporation; M. Liu, CRES; K. Kotian, F. Zhang, Center for Reliable Energy Systems

IPC2014-33454, Effects of Weld Strength Heterogeneity on Crack Driving Force in Stress and Strain Based Design Scenarios
S. Hertelé, K. Van Minnebruggen, W. De Waee, Gent University; N. O’Dowd, University of Limerick; M. Verstraete, Soete Laboratory-Ghent University

IPC2014-33711, Application of Tensile Strain Models to Multiple Grades of Pipelines
W. Wei Zhang, Z. Zhang, P. Yang, J. Zhang, China Petroleum Pipeline Engineering Corporation

IPC2014-33582, Evaluation of Pressurized Cold Bend Pipe Body Tensile Fractures Under Bending Loads
C. Cakiroglu, M. Kainat, S. Adeeb, R. Cheng, University of Alberta; M. Sen, Enbridge Pipelines Inc.

Session 11-1-6: Strain-Based Design Posters
Session Chair: Mark Piazza, Colonial Pipeline Company
Room: TELUS Macleod Hall A
Date: Poster Session 1, Tuesday, September 30, 15:30 - 17:30
Date: Poster Session 2, Wednesday, October 1, 09:00 - 10:15

IPC2014-33225, Design of the Full Scale Experiments for the Testing of the Tensile Strain Capacity of X52 Pipes With Girth Weld Flaws Under Internal Pressure and Tensile Displacement
C. Cakiroglu, S. Adeeb, R. Cheng, University of Alberta; M. Sen, Enbridge Pipelines Inc.
Session 12-1-1: Failure Frequency Assessment I

Session Chair: Guy Desjardins, Desjardins Integrity Ltd
Room: TELUS Macleod E4
Date: Wednesday, October 1
Time: 08:30 - 12:00

08:30
IPC2014-33117, Development of Sinkhole Hazard for Pipeline Risk Assessment in Northern Florida
J. Keaton, L. Boudra, AMEC Americas

09:00
IPC2014-33728, Probability of Brittle Fracture in Gas Pipelines

09:30
IPC2014-33260, Reducing Human Error Using a Human Factors Life Cycle Approach
L. Harron, Enbridge Pipelines Inc.; D. Atwood, Human Factors Applications

10:30
IPC2014-33552, Structural Reliability of Free Spanning Pipelines
F. Van den Abeele, Subseawolf; F. Boël, J. Vanden Berghe, Fugro GeoConsulting Belgium

11:00
IPC2014-33639, Quantitative System Specific Likelihood Algorithms for System Wide Risk Assessment
S. Kariyawasam, N. Zhang, M. Al-Amin, B. Ong, H. Wang, TransCanada Pipelines

11:30
IPC2014-33147, Probability Calculation of Equipment Impact Based on Reliability Method
J. Lu, W. Wu, Z. Zhang, J. Zhang, China Petroleum Pipeline Engineering Corporation

Session 12-1-2: Incident Data Analysis & Target Reliability Levels

Session Chair: Mark Stephens, C-FER
Room: TELUS Macleod E4
Date: Tuesday, September 30
Time: 10:30 - 12:00

10:30
IPC2014-33366, Onshore Natural Gas and Hazardous Liquid Pipeline Natesh in the USA: Analysis of PHMSA Incident Reports
S. Girgin, E. Krausmann, European Commission Joint Research Center

11:00
IPC2014-33151, Assessment of the Reliability Level Embedded in Pipeline Design Codes
S. Timashev, A. Bushinskaya, Science and Engineering Center

11:30
IPC2014-33129, Building a Target Reliability Adaptive to China Onshore Natural Gas Pipeline
J. Zhang, Z. Zhang, Z. Yu, W. Wu, China Petroleum Pipeline Engineering Corp; Y. Chen, China Petroleum Pipeline Coating Engineering Co., Ltd

Session 12-1-3: Failure Frequency Assessment II

Session Chair: Shahani Kariyawasam, TransCanada Pipelines Limited
Room: TELUS Macleod E3
Date: Thursday, October 2
Time: 10:30 - 14:00

10:30
IPC2014-33146, Pragmatic Approach to Estimate Corrosion Rates for Pipelines Subject to Complex Corrosion
M. Dinn, University of Calgary; L. Huyse, Chevron ETC

11:00
IPC2014-33511, Probabilistic Modeling of Crack Threats and the Effects of Mitigation
A. Nielsen, J. Mallet-Paret, K. Griffin, Enbridge Pipelines Inc.

11:30
IPC2014-33213, Reliability Analysis of Corroding Pipelines Considering the Growth and Generation of Corrosion Defects
H. Qin, W. Zhou, Western University

13:30
IPC2014-33368, Markovian Analysis of Aging Distributed Systems Remaining Life
A. Bushinskaya, Science and Engineering Center Ural Branch Russian Academy of Sciences; S. Timashev, Science and Engineering Center
Technical Tracks

**Session 13-1-1: Regulatory Issues**

**Session Chair:** Robert Smith, US DOT/PHMSA  
**Session Co-Chair:** Iain Colquhoun, National Energy Board  
**Track Sponsor:** The National Energy Board of Canada & The US Pipeline and Hazardous Materials Safety Administration

**Topic 13-1: Standards & Regulations**

**Session 13-1-1: Regulatory Issues**

**Session Chair:** Robert Smith, US DOT/PHMSA  
**Session Co-Chair:** Iain Colquhoun, National Energy Board  
**Track Sponsor:** The National Energy Board of Canada & The US Pipeline and Hazardous Materials Safety Administration

**09:30**  
**IPC2014-33207, Guidelines for Interpretation and Application of API Standard 1104**  
W. Bruce, B. Amend, G. Rogers, Det Norske Veritas (U.S.A.), Inc.; Y. Wang, CRE; S. Papp, Spectra Energy

**10:30**  
**IPC2014-33275, The Reliability-Based Assessment of an In-Service X80 Natural Gas Pipeline in China**  
K. Wen, B. Zhao, J. Song, China University of Petroleum (Beijing); W. Wei Zhang, Z. Zhang, China Petroleum Pipeline Engineering Corporation

**11:00**  
**IPC2014-33586, An Approach for Maturing Competency Development in the Pipeline Industry**  
L. Lindholm, N. Robeson, D. Flegel, R. Sahney, PBoK Technical Training Ltd.

**Session 13-1-2: Standards & Recommended Practices**

**Session Chair:** Iain Colquhoun, National Energy Board  
**Room:** HYATT Walker/Bannerman  
**Date:** Wednesday, October 1  
**Time:** 09:00 - 11:30

**09:00**  
**IPC2014-33224, A Practical Approach to Continuous Quality Control of Pipeline System Records**  
A. Lutz, T. Bubenik, DNV GL

**10:30**  
**IPC2014-33275, The Reliability-Based Assessment of an In-Service X80 Natural Gas Pipeline in China**  
K. Wen, B. Zhao, J. Song, China University of Petroleum (Beijing); W. Wei Zhang, Z. Zhang, China Petroleum Pipeline Engineering Corporation

**11:00**  
**IPC2014-33586, An Approach for Maturing Competency Development in the Pipeline Industry**  
L. Lindholm, N. Robeson, D. Flegel, R. Sahney, PBoK Technical Training Ltd.
**ASME Pipeline Systems Division Best Paper Award (The Rio Pipeline Award)**

IPC 2014 will carry on the tradition started in 2002, when the Pipeline Systems Division (PSD) introduced the Rio Pipeline Award to honour the best paper presented at the International Pipeline Conference (IPC).

Selected from among all papers presented during the IPC 2014 technical sessions, the winner shall receive the Rio Pipeline Award at the final luncheon of the Conference on Friday, October 3.

Apart from gaining the recognition of having authored the best paper, the PSD has agreed to provide airfare and expenses for the winning author to present his/her paper at the Rio Pipeline Conference & Exposition sponsored by the Brazilian Petroleum Institute (IBP) in Rio de Janeiro in September 2015.

**The Calgary Pipeline Award**

IBP and IPC have a reciprocal arrangement and the best paper (and winner of the Calgary Award) at IBP 2013 in Rio was authored by Gilmar Z. Batista, Marcy S. de Menezes, Andrés F. F. Acuña, Thiago L. Silveira, Celso R. Araújo, and Edgar Schneider.

Their paper, entitled "Welding and Heat Treatment of Heavy Wall API 5L X65 Sour Service Pipes" will be presented by Marcy S. de Menezes at 11:00, Wednesday, October 1, 2014.

**Abstract**

In the design of the onshore part of the export gas pipeline from pre-salt, due to the high design pressure, it will be necessary to apply pipes with wall thickness of 1.452 inches, that is much higher than the thicknesses traditionally used in onshore pipelines, which rarely exceeds 1 inch. According to the design code ASME B31.8 and the Brazilian standard NBR 12712, when the wall thickness exceeds 1.25 inches, it is necessary to perform a stress relieving heat treatment after welding. The mandatory requirement of the standard raises some concerns, such as the difficulty of carrying out this treatment in field conditions, the heating effect in mechanical properties of pipe body and the stresses imposed by thermal expansion, particularly in the tie-in welds where the restrictions are significant. In the gas to be transported by these pipes, there is also the presence of H2S which can result in sulfide stress cracking. To avoid this, it is necessary to use pipes and welding procedures suitable for sour service, including sulfide stress cracking test and hardness test. Due to the particularities of this project, it was decided to conduct a comprehensive welding study that serves as the basis for the use of this material in the field.

In this study, the girth weld and pipe body were evaluated in the heat treated and without heat treatment conditions. The methodology of analysis included tensile, nick-break, side bend, Charpy, CTOD, hardness, HIC and SSC tests. Additionally, the CTOD results were compared with the results from a fracture mechanics study that was done considering the residual stress not relieved because the absence of heat treatment. The results demonstrated that the heat treatment decreases the yield and tensile strength from pre-salt, due to the high design pressure, it will be decided to conduct a comprehensive welding study that serves as the basis for the use of this material in the field.

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**Dr. Mo Mohitpour Distinguished Lecture Series**

**Room:** TELUS Macleod Hall D  
**Date:** Wednesday, October 1  
**Time:** 13:45 - 15:30  

**Purpose:**  
Recognize the technical contributions of individuals that have stood the test of time.

**Background:**  
At IPC 2012 the conference organizing committee started the tradition of honoring an individual that has made a significant contribution to the pipeline industry with their professional work as a Distinguished Lecturer. In 2012, IPC honored Willard A. (Bill) Maxey. In special recognition of Dr. Mo Mohitpour, posthumously, IPC has established this panel in honor of Dr. Mo to recognize his significant technical contribution to the pipeline industry. Dr. Mo’s significant contributions to the pipeline industry will be recognized by Dr. Alan Murray. Two of Dr. Mo’s previously published papers will then be represented. These papers will also be presented to recognize the significant contributions of Dr. Mo and is other technical collaborators.

The goal of the Distinguished Lecture Series is to present papers and presenters were identified by a selection committee and the presentations will provide a perspective on development of the original work, how the work has evolved over time, and how the work aligns with technical approaches still used today.

**Panel Presenters**  
**Panel Facilitators:** Taylor Shie, Shell Oil Company  

**Panel Participants**  
- Dr. Alan Murray  
- Dr. Kamal Botros  
- Mr. Gabriel Nahas

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**Pipeline Executive Leadership—Challenging Pipeline Performance**

**Room:** TELUS Macleod Hall D  
**Date:** Wednesday, October 1  
**Time:** 15:30- 17:30  

**Purpose:**  
Provide conference attendees with the opportunity to better understand the challenges faced by Executive Leadership. Define ‘Pipeline Performance’, and discuss key challenges across the pipeline industry from the perspective of Executive Leadership.

**Background:**  
IPC is a forum to share experience across the industry, challenge the development and implementation of new technology, and to disseminate information and experiences that can be used to increase the safety and reliability of pipelines. Recognizing that all stakeholders have an obligation to increase pipeline safety and reliability, this forum has been created as a unique opportunity and presentation format for Executive Leadership from pipeline operating companies to present their perspective, along with an opportunity to answer questions raised by conference attendees.

**Panel Presenters**  
**Panel Facilitator** Patrick Vieth, Dynamic Risk  

**Panel Participants**
- Tim Felt, Colonial Pipeline - President and CEO  
- Alex Pourbaix, TransCanada Pipelines, Executive Vice-President and President, Development  
- Alan Armstrong, Williams Companies - President and CEO  
- Ron McClain, Kinder Morgan Energy Partners – Products Pipelines - President

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**Panel Session 1: Integrity Leading KPIs: Lessons Learned & Path Forward**

**Room:** TELUS Glen 206  
**Date:** Monday, September 29  
**Time:** 08:00 - 11:30  

**Purpose**  
The purpose of the panel is to share lessons learned for identifying a path to Key Performance Indicators (KPIs) enabling the anticipation of integrity threats leading to incidents. The panel will discuss benefits and challenges in measuring, trending and interpreting pipeline integrity performance. Furthermore, the panel seeks to create a brainstorming atmosphere engaging audience participation with the goal of synthesizing a potential path forward to leading KPIs.

**Background**  
Pipeline industry standards such as API 1160 and ASME B31.8S have been continuously updating their recommended indicators for assessing pipeline integrity performance. Pipeline industry associations such as CEPA and API ADPL have also worked on indicator standardization and reporting resulting in the development of strategies and advisories for performance improvement. Similarly, provincial and federal regulators (e.g. PHMSA, NEB, AER, BC OGC) have recently updated their performance measures. The UK Health and Safety Executive has developed tools for improving Health, Safety and Environmental performance within the safety culture context, as well as KPIs for evaluating and reviewing integrity management performance.

Multiple stakeholders have challenged pipeline integrity performance, requiring the review of the existing leading indicators and their ability to anticipate incidents and trigger actions.

**Panel Presenters**  
**Panel Facilitator:** Phil Kormann  

**Panel Participants**
- Ian Colquhoun, National Energy Board of Canada  
- Joe Zhou, TransCanada Pipelines Limited  
- Harvey Haines, Kiefner & Associates – APPL RTD Group  
- James Ferguson, Stantec  
- Felix G. G. Saint-Victor, DNV  
- Thomas Linder, Canadian Energy Pipeline Association

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**Panel Session 2:**  
**The Quest for Social Acceptance**

**Room:** TELUS GLEN 201/202  
**Date:** Monday, September 29  
**Time:** 08:00 - 11:30  

**Purpose**  
Inform and enhance the knowledge and awareness of attendees about the importance and driving forces behind the meaning and understanding of social acceptance as it pertains to major oil and gas infrastructure projects.

Room: TELUS Glen 206
Date: Monday, September 29
Time: 13:15 - 16:00

Purpose
The panel, through its discussions, will enable greater North American alignment on Safety Management Systems and Safety Culture for energy pipelines.

Background
Both the United States and Canada are witnessing steady growth in their energy sectors, spurring increased pipeline construction and repurposing of existing lines. This growth, and a related increase in public interest with regard to safety and environmental issues associated with energy production and transportation, has brought pipeline regulators to the forefront of the conversation around safe and sustainable growth in the energy sector.

Other major industries have successfully implemented comprehensive Safety Management Systems (SMS) in support of an effective safety culture. This has resulted in marked improvements in company performance. Regulators believe it is logical to move forward in the development and implementation of similar programs for the oil and gas industry.

The U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA) and Canada’s National Energy Board (NEB) continue to coordinate by sharing information, sponsoring public events to gain broader perspectives, participating in the development of industry standards, and releasing regulatory guidance/requirements on SMS and safety culture. However, the path toward further development and implementation of SMS could be improved through further alignment of North American regulatory requirements. Major alignment must be a hallmark of this initiative since several sizable pipeline companies own and operate pipelines under both U.S. and Canadian regulatory frameworks.

This panel will summarize the related actions taken to date, showcase the growing areas of regulatory alignment, and build upon the current regulatory vision for full implementation of SMS and an overall safety culture within North American pipeline companies.

Panel Presenters
Panel Facilitators: Rob McManus, Alberta Energy Regulator.

Panel Participants:
- Ian Anderson, President, Kinder Morgan Canada
- Sheila Leggett, Consultant, Former Chair of Joint Review Panel for Northern Gateway
- Jason Switzer, Director of Corporate Consulting, Pembina Institute
- Katie McKinnon, Stakeholder Engagement Specialist, TERA Environmental Consultants
- Brenda Kenny, President, Canadian Energy Pipeline Association
- Brenda Kenny, President, Canadian Energy Pipeline Association

Panel Session 4: Pipeline Leak Detection Systems: Industry Regulations, Strategies, Challenges, & Technology

Room: TELUS Glen 201/202
Date: Monday, September 29
Time: 13:15 - 17:30

Purpose
The objective of this panel session will be to present perspectives on how industry is progressing on various fronts related to leak detection performance. Panel discussions will provide opportunities for alignment and to give feedback on direction of industry-based initiatives.

Background
Pipeline companies are being held to a standard of perfection regarding safe pipeline operation and environmental responsibility. People, technology, process, procedures, standards and regulations will need to converge to meet what the public expects when pipeline incidents occur. Effectively mitigating impacts with prompt detection is a critical element to achieving this objective.

Leak detection is a key focus area within the oil and gas pipeline transportation industry and is being reviewed extensively by government regulators, operating companies and technology vendors. Regulatory bodies are exploring ways to push the industry to perform to a higher leak detection standard and many aspects of leak detection are being reviewed including proper front-end design, standardization, research, rupture detection and potential consideration of leak detection performance targets. Understanding current and potential future expectations is critical as engineering approaches for new pipelines and retrofit/expansion projects will need to be adjusted.

Technology providers need to identify new and innovative ways to go beyond the current limits and enhance the key performance indicators of leak detection systems including sensitivity, accuracy, reliability and robustness. The panel presenters will deliver leak detection content relating to USA and Canadian regulations, pipeline operational challenges, technology research and the application of different technologies such as computational pipeline monitoring and external systems.

Expected results include a documented list of key points raised during the discussions, suggested and existing strategies coming from different organizations, as well as ongoing and future initiatives on pipeline leak detection.

Panel Presenters
Panel Facilitators: Ray Philpennko, Enbridge Pipelines Inc.; Renan Baptista, Petrobras R&D Centre

Panel Participants:
- Steve Nanney, US DOT / PHMSA
- Linda Daugherty, Deputy Associate Administrator for Pipeline Safety, DOT/PHMSA
- Jim Fox, Business Unit Leader, Strategy & Analysis, NEB
- Jeff Wise, Associate Administrator for Pipeline Safety, DOT/PHMSA
- Claudine Bradley, Technical Leader - Safety, Operations, NEB
- Peter Watson, Chair and Chief Executive Officer, NEB

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- Claudine Bradley, Technical Leader - Safety, Operations, NEB
- Peter Watson, Chair and Chief Executive Officer, NEB
Monday, September 29, Full Day Tutorials

Time: 08:00 – 17:00

Tutorial #1: Pipeline Integrity Evaluations & Engineering Assessments
Presenter: Andrew Cosham, Atkins Boreas
Room: Imperial 6

Description: An introduction to the assessment of defects in pipelines. Defect types will be discussed, with emphasis on their potential to result in failure. The background to the commonly applied defect assessment methods will be presented, ranging from simple, quick assessments, to more detailed "fitness-for-purpose" analysis.
- Introduction to pipeline defects, and why pipelines fail
- Fundamental pipeline defect failure relationships
- How to assess corrosion defects
- How to assess gouges and dents
- How to assess weld defects
- Pipeline integrity

Tutorial #2: Pipeline Risk Management
Presenter: Mark Stephens, C-FER Technologies
Room: Imperial 3

Description: The course will focus on:
- Hazard and threat identification
- Methods for probability and consequence estimation
- Risk measures and the determination of acceptable risk levels
- Risk control strategies

Tutorial #3: Pipeline Design & Construction: 101
Presenter: Alan Murray, Principia Consulting
Room: Imperial 4

Description: Overview of the following fundamentals:
- Hydraulic design considerations for gas, liquid and two phase systems
- Route selection, water crossings and geotechnical issues
- Criteria for materials and coating selection
- Design loads on buried pipe
- Batching in products lines
- Pigging operations for cleaning and inspection lines
- Surveillance systems, maintenance strategies, risk-based inspection and repair methods

Tutorial #4: An Engineering Overview of Off-Shore Pipeline Design
Presenters: Mark Marley, DNV; Prof. Kenneth MacDonald
Room: Walker

Description: An overview of offshore pipeline engineering. Topics include:
- Risk-based design principles
- Review of design codes
- Load calculation and limit state design
- Pipeline materials, welding and corrosion protection
- Offshore pipeline construction; lay barge; reeling; tow; trenching and burial
- On-bottom stability and span assessment and correction
- Pipeline materials selection and design
- Pipeline integrity
- Operation, inspection, re-qualification and repair

Tutorial #5: Pipeline Materials
Presenters: Stephen Rapp, Spectra Energy; Gary Vervak, Spectra Energy
Room: Neilson 1

Description: An overview of the mechanical properties of pipeline materials and how they relate to pipeline integrity:
1. Vintage Materials
   - Historical Overview of Manufacturing Processes
   - Chronology of API 5L
   - US Regulatory Advisory Notices of Vintage Pipe (Liquid/Gas)
   - Current Industry Activities With Respect to Vintage Pipelines
   - Chronology of Field Joining Practices
2. Modern Materials
   - Overview of applicable specifications
   - Pipe Materials Selection and Design
   - Responsible Procurement Practices, Legacy Problems
   - Purchasing Specification Enhancements

Tutorial #6: Geotechnical Concerns in Pipeline Design & Operation
Presenters: Alex Baumgard, BGC Engineering; Mark Leir, BGC Engineering Inc.
Room: Stephen

Description: The purpose of this workshop is to emphasize the importance of identifying and managing the impact of geohazards, such as landslides and river erosion on pipeline feasibility and operations. This course is intended for engineers and project managers involved in pipeline routing, design, and operations and pipeline integrity. Major themes will include:
- Introduction to geohazards
- The significance of geohazards on pipeline integrity
- Pipeline regulations concerning geohazards
- How to identify and avoid geohazards
- How to prioritize and manage geohazards
- Monitoring Strategies – Determining when to monitor a site
- Mitigation Strategies - How to protect the pipeline against geohazards

Tutorial #7: Environmental Factors Influencing Pipeline Design & Operation
Presenters: Trevor Bohay, Golder Associates Ltd.; Brent Murphy, Golder Associates Ltd.; Corey Sterlura, Golder Associates Ltd.; Corey De La Mare, Golder Associates Ltd.; Brent Olson, Golder Associates Ltd.; Les Fuller, Golder Associates Ltd.; Dennis O’Leary, Golder Associates Ltd.; Kevin Seel, Golder Associates Ltd.
Room: Bannerman

Description: The purpose of this workshop is to emphasize the importance of early identification of environmental considerations when planning and designing a pipeline. Early identification eases mitigation efforts, which can have a positive effect on the permitting process. In addition to planning and routing studies, the entire environmental lifecycle of a pipeline will be discussed including mitigation of environmental concerns during construction, emergency response related to pipeline spills, and subsequent remediation of such spills, followed by reclamation at the end of the pipeline’s life. Tools for routing decision making will be discussed.
Major topics will include:
- First Nations Consultation and Archaeological Impact Assessments
- Watercourse and wetlands considerations
- Wildlife considerations for pipeline routing
- National Energy Board requirements
- Emergency Preparedness, Emergency Response, and Remediation
- Update on Province of British Columbia’s proposed new, world class spill response regime
- Reclamation
- Importance of Route selection and early consideration of environmental, socio-cultural, technical and economic constraints and opportunities

Tutorial #8: Fracture Mechanics
Presenters: Carl E. Jaske, DNV; Tom Bubenik, DNV
Room: Herald

Description: An overview of fracture mechanics principles including:
- Basic materials properties and their application to design
- Linear elastic fracture mechanics
- Elastic-plastic fracture mechanics
- Fracture-toughness testing
- Fracture behavior of steels
- Fatigue crack growth
- Environmentally assisted crack growth
- Predicting failure stress in pipelines
- Calculation of remaining life for pipelines
- Use in pipeline failure analysis
Monday, September 29,  
Half Day Tutorials  
Morning Sessions  
Time: 08:00 – 11:45

Tutorial #9: Internal Corrosion & Solids Management  
Presenter: Sandy Williamson, Ammonite Corrosion  
Room: Imperial 1  
Description:  
The discussion will examine the following:  
• Effect of flow on corrosion  
• Localized corrosion and corrosion monitoring  
• Predicting localized corrosion in pipelines  
• Options for mitigating internal corrosion

Tutorial #10: SCADA & Leak Detection Systems  
Presenters: Mike Yoon, Yoon Consulting; Bruce Warren, BCT Consulting  
Room: Doll  
Description:  
The tutorial will provide an overview of pipeline SCADA systems and leak detection systems for hydrocarbon liquids. The SCADA overview will provide an overview of SCADA concepts, history, future trends and SCADA project management. The tutorial may look at data accuracy, data formats, data security, polling methodologies, communication system alternatives and provide a description of the basic functions within the SCADA host. Leak detection will discuss material balance methods, with and without line pack compensation, and will discuss basic principles as they relate to instrumentation selection and SCADA system design, together with a discussion on leak detect ability and uncertainty.

Tutorial #11: Pipeline Stress Analysis  
Room: Imperial 2  
Description:  
This session will focus on the theoretical and practical aspects of piping stress analysis. Topics to be covered include pipeline monitoring and analysis related to surface loading and geotechnical concerns.

Wednesday, October 1,  
Half Day Afternoon Sessions  
Time: 13:30 – 16:30

Tutorial #15: Management of Stress Corrosion Cracking  
Presenters: Jenny Been, TransCanada Pipelines Limited; Elvis SanJuan Riverol, TransCanada Pipelines Limited; Derek Spitzmacher, Pinnacle Integrity Engineering  
Room: Stephen  
Description:  
The following subject matter will be discussed:  
• What is Stress Corrosion Cracking and what is Corrosion Fatigue? (photos, show and tell samples, mechanisms)  
• Do we have it and how do we know? (data gathering, predictive modeling, assessments incl. EMAT, direct assessment, hydrotests)  
• How sure can we be? How sure do we need to be? (assessment reliability, inspection interval, industry best practices, regulations)  
• What do we do when we find cracks? (in the ditch, crack sizing techniques, mitigation methods and strategy)  
• Now that we have found cracks on our line, how do we manage the rest?

Tutorial #16: Recommended Practices for Pipeline Repair  
Presenter: Bob Smyth, PetroSleeve  
Room: Herald/Doll  
Description:  
Discussion on pipeline integrity issues, repair and new technologies with a focus on:  
• Protocols  
• Defect descriptions  
• Defect analysis  
• Safety  
• Repair Methods  
• Codes & standards

Tutorial #17: Reliability Based Design & Assessment  
Presenter: Maher Nessim, C-FER Technologies  
Room: Walker/Bannerman  
Description:  
An introduction to Reliability Based Design and Assessment  
• An introduction to reliability and limit states design methods  
• Application  
• Target reliability levels  
• Reliability estimation techniques

Tutorial #18: Facilities Integrity Management  
Presenter: Wytze Sloterdijk, DNV KEMA Energy & Sustainability  
Room: Neilson 2  
Description:  
Managing Facility Integrity. Topics to be discussed include:  
• Risk management  
• Integrity planning  
• Maintenance optimization

Tutorial #19: Pipeline In-line Inspection — Validation & Use of Results  
Presenter: Phillip Nidd, Dynamic Risk USA; Keith Leevis, Dynamic Risk  
Room: Neilson 1  
Description:  
This tutorial will address what companies need to do after the data is received from the ILI vendor. The checks that should be done to determine whether the inspections meet the contractual quality communicated by the vendor (e.g. +/- 10%, 80% of the time). In addition to the analysis of reporting quality, the session will also discuss how to use tool tolerance in making decisions based on tool data (e.g. Re-inspection intervals), Issues such as probability of detection and probability of indication will also be covered.