2014 IEEE Petroleum and Chemical Industry Technical Conference

(PCIC 2014)

San Francisco, California, USA
8-10 September 2014
TABLE OF CONTENTS

MONDAY SEPTEMBER 8, 2014 – GENERAL TECHNICAL SESSION – San Francisco Marriott Marquis – YB Salon 1 - 7
8:00 a.m. – 11:15 a.m.  Presiding – Donald G. Dunn

PCIC-2014-1  Electrical Engineering Competence Mapping in an IOC and Possibilities for Industry Collaboration  
Paul Owen  Shell  
Jean-Charles Guillem  2B1st Consulting  

PCIC-2014-2  Expert Witnesses: The Basics  
Donald W. Zipse  Electrical Forensics, LLC  
Daleep C. Mohla  DCM Electrical Consulting Services, Inc.  

PCIC-2014-3  Symmetrical, Total, and Peak; Oh My! - Is Current All I Use to Select My Circuit Breaker?  
Samala Santosh Reddy  Powell Industries  
Roy E. Cosse, Jr.  Chevron  
Michael W. Wactor  Powell Industries  
Steve Andre  Chevron  

MONDAY SEPTEMBER 8, 2014 – GENERAL TECHNICAL SESSION II – San Francisco Marriott Marquis - YB Salon 7 
2:00 p.m. – 5:00 p.m.  Presiding – Louis Barrios

John P. Nelson  NEI Electric Power Eng  
Joshua Billman  NEI Electric Power Eng  
James Bowen  Aramco Services Company  
Dane Martindale  Aramco Services Company  

PCIC-2014-5  Hazardous Rated Electrical Equipment and the Arc Flash Hazard  
Rick Mendler  Phillips 66  
Rehanul Hasan  Appleton Group  
Jean-Baptiste Trolle  Emerson Network Power  
Nabil L. Mina  Appleton Group  

PCIC-2014-6  Inaccuracies Introduced Using Infrared Windows and Cameras  
Tony Holliday  CorDex Instruments, Ltd.  
John A. Kay  Rockwell Automation  

MONDAY SEPTEMBER 8, 2014 – PRODUCTION TECHNICAL SESSIONS I – San Francisco Marriott Marquis - YB Salons 10-15  
2:00 p.m. – 5:00 p.m.  Presiding – Mike Habison

PCIC-2014-7  Transforming Partial Discharge Data in Volts and Coulombs for Six High-Voltage Motors  
Alfred O. Vouk  Saudi Aramco  
Greg Stone  Qualtrill-Iris Power  
Ronald W. Carlson  Saudi Aramco  

PCIC-2014-8  Ensuring Switchgear Integrity in High Power Installations  
John Schaffer  G&W Electric  
Terence Hazel  Schneider Electric  

G.C. Stone  Qualtrill-Iris Power  
Donald G. Dunn  Consultant  
Meredith K. W. Stranges  GE Power Conversion  

Monday September 8, 2014 – CHEMICAL TECHNICAL SESSIONS I – San Francisco Marriott Marquis - YB Salon 1/6  
2:00 p.m. – 5:00 p.m.  Presiding – Ryan Maynus

PCIC-2014-10  Can a Shaft Brush be Safely Applied on a Motor in a Class I Hazardous Location?  
Mike J. Meili  Baldor, a member of the ABB Group  
Francis G. Ladonne  UL LLC  
Donald W. Ankele  UL LLC  

H. Carl Walther  DuPont Performance Lubricants  
Richard A. Holub  DuPont Engineering  

PCIC-2014-12  Establishing a Load-Based Upper Size Limit to Control Oversizing of Electrical Equipment  
Cory A. Hellrich  Saudi Arabian Oil Company  
Ron W. Carlson  Saudi Arabian Oil Company  

Monday September 8, 2014 – TRANSPORTATION TECHNICAL SESSIONS I – San Francisco Marriott Marquis - YB Nob Hill  
2:00 p.m. – 5:00 p.m.  Presiding – Andrew Ackerrman

PCIC-2014-13  The Impact Voltage and Frequency Variations Have on Squirrel Cage Induction Motors  
Austin H. Bonnett  Austin Bonnet Engineering LLC  
Helmuth Giatt  Nidec Motor Corporation  
Steve Hauck  Nidec Motor Corporation  

PCIC-2014-14  Adjustable Speed Drives and Motor Protection  
Raymond Torres  Tesoro Logistics  
Amir Haqphanah  Mangan, Inc.  
Tryton Bower  Mangan, Inc.  
Robert Delay  Rockwell Automation  
Richard Paes  Rockwell Automation
PCIC-2014-15  Line Start Permanent Magnet Motors - Starting, Standards and Application Guidelines  129
Robbie McElveen  Baldor Electric Company
Mike Melfi  Baldor Electric Company
Roger Daugherty  Baldor Electric Company

Tuesday September 9, 2014 – REFINING TECHNICAL SESSION I – San Francisco Marriott Marquis - YB Salon 3 – 6
8:15 a.m. – 11:15 a.m. Presiding – Rick Bono

PCIC-2014-16  Substation Replacement Options and Considerations  141
Frank E. Bresnan, Jr.  Anvil Corporation
Erik Jonson  Anvil Corporation
Tyler Somes  BP

PCIC-2014-17  Integrating Advanced Relays on Medium Voltage Switchgear with Safety Control Systems  149
Jose Coraspe  Phillips 66
David McCauley  Phillips 66
Tim McCauley  Phillips 66
Vincent W. Wedelich  Burns & McDonnell

PCIC-2014-18  The Importance of Inspections on Electrical Installations in Hazardous Locations  155
Estelito Rangel Junior  Petrobras
Alan Rômulo S. Queiroz  Petrobras
Maurício F. de Oliveira  Petrobras

Tuesday September 9, 2014 – ELECTROCHEMICAL TECHNICAL SESSION I – San Francisco Marriott Marquis - GG Salon C1/C2
8:15 a.m. – 11:15 a.m. Presiding – Janet Flores

Brandon Cassimere  ExxonMobil Upstream Research Co.
B. Fred Evans  Air Energi
Don E. Martin  ABB Inc. Power Systems Consulting
Sheng Yang  ABB Inc. Power Systems Consulting

PCIC-2014-20  Differential Protection for Medium Voltage Pulse Transformers  173
Lubomir Sevov  GE Digital Energy
Sheldon Kennedy  Niagara Transformer Co.
Richard Paes  Rockwell Automation
Pero Ostojic  GE Digital Energy

PCIC-2014-21  Dielectric Testing and Corona Inspection of a 14.4kV, 1800RPM Centrifugal Compressor Motor Stator Insulation System  185
Meredith K. W. Stranges  GE Power Conversion
Saeed Ul Haq  GE Power Conversion
Luis H. A. Teran  GE Power Conversion
William Veerkamp  The Dow Chemical Company

Tuesday September 9, 2014 – MARINE TECHNICAL SESSION I – San Francisco Marriott Marquis - YB Salon 7
8:15 a.m. – 11:15 a.m. Presiding – Darrell Broussard

PCIC-2014-22  New IEEE & IEC Standards for Ships and Oil Platforms  191
Yuri Khersonsksy  Chair, IEEE 1662, 1709 and 1826 WGs
Giorgio Sulligoi  Dept. of Engineering and Architecture
University of Trieste, Italy

PCIC-2014-23  Adjustable Speed Drive Selection for Electric Submersible Pumps  201
Cheryl Schmehl  Rockwell Automation
Jeff Kavanagh  Rockwell Automation
Mark McKinley  Hilcorp, Alaska
Richard Paes  Rockwell Automation
Will McBride  Consultant

PCIC-2014-24  Preventing Centrifuge Failures Due to Voltage Distortion on a Drilling Rig  217
A. H. Hoevenaars  Mirus International Inc.
M. McGraw  NSOEM
K. Rittammer  Apex Oilfield Systems

8:15 a.m. – 11:15 a.m. Presiding – Bill Lockley

Raj Mistry  Siemens Industry, Inc.
Bill Finley  Siemens Industry, Inc.
Scott Kreitzer  Siemens Industry, Inc.
Ryan Queen  Siemens Industry, Inc.

PCIC-2014-26  System Analysis of Component Outage in Electrical LNG Plant with Voltage Source Inverters  237
Toshiyuki Fujii  Mitsubishi Electric Corporation
Hiroyuki Masuda  TMEIC
Yoshihiro Ogashi  TMEIC
Masahiko Tsukakoshi  TMEIC
Takehi Tachibana  TMEIC

PCIC-2014-27  Ten Years High Speed Motors with Massive Shaft - Experience and Outlook  249
Hartmut Walter  Yaskawa-Siemens A&D
Horst Kuemmler  Siemens AG
Axel Moehle  Siemens AG
Tuesday September 9, 2014 – SAFETY TECHNICAL SESSION I – San Francisco Marriott Marquis - YB Nob Hill
8:15 a.m. – 11:15 a.m. Presiding – Ed Larsen

PCIC-2014-28 Arc Flash Hazard Reduction at Incoming Terminals of LV Equipment
Maurice D’Mello GE – Industrial Solutions
Michael Noonan Suncor Energy Services Inc.
Marcelo Valdes GE Industrial Solutions
Jairo Benavides Suncor Energy Services Inc.

PCIC-2014-29 Do’s and Don’ts of Personal Protective Grounding
James R. White Shermco Industries, Inc.
Shahid Jamil BP America, Inc.

PCIC-2014-30 Arc Flash Considering Generator Decrement Curves
Lance Grainger Grainger Electrical Research
Duane Leschert Worley Parsons
Andrew Bennett Suncor Energy, Inc
Kent Zehr Suncor Energy, Inc.

Wednesday September 10, 2014 – REFINING TECHNICAL SESSION II San Francisco Marriott Marquis - YB Salon 7
8:00 a.m. – 11:00 a.m. Presiding – Meredith Stranges

PCIC-2014-31 Reliable Generator Islanding Detection for Industrial Power Consumers with On-Site Generation
RadhaKiranMaye Anne Schweitzer Engineering Laboratories, Inc.
Faridul Katha Basha Schweitzer Engineering Laboratories, Inc.
Ramanathan Palaniappan Valero Bill Greehey Refineries
Kent L. Oliver Schweitzer Engineering Laboratories, Inc.
Michael J. Thompson Schweitzer Engineering Laboratories, Inc.

PCIC-2014-32 Protection of Utility-Refinery Interconnection
Charles J Mozina Consultant –Beckwith Electric

PCIC-2014-33 Accurate Performance of Residual Voltage Transfer Schemes
Tony Zhao GE Energy
Craig Mouton ExxonMobil Research and Engineering
Lubomir Sevov GE Digital Energy - Multilin

Wednesday September 10, 2014 – ELECTROCHEMICAL TECHNICAL SESSION II – San Francisco Marriott Marquis - YB Salon 4 – 6
8:15 a.m. – 11:15 a.m. Presiding – Patrick Loupe

PCIC-2014-34 Electrical Obsolescence Management: How to Spend $1B Efficiently
Ritchie Pragale Saudi Aramco
Ahmed Bakhsh Saudi Aramco
Amar Patel Saudi Aramco
Neil Apps Saudi Aramco

PCIC-2014-35 Oil Field Retrofit of ESPs to Meet Harmonic Compliance
Marek Farbis Mirus International, Inc.
Anthony H. Hoevenaars Mirus International, Inc.
John L. Greenwald Conoco Phillips

PCIC-2014-36 Increasing Copper Production in Electrochemical Plants Using New Small Transformer - Rectifiers in Parallel with Existing Power Rectifiers
Ricardo Fuentes GE Power Conversion (formerly IDT)
Jorge Estrada GE Power Conversion (formerly IDT)
Luis Neira GE Power Conversion (formerly IDT)
Eric Barrientos GE Power Conversion (formerly IDT)

8:15 a.m. – 11:15 a.m. Presiding – Richard Barker

PCIC-2014-37 Snubber Design for Transformer Protection
Peter E. Sutherland GE Energy
Marcelo E. Valdes GE Industrial Solutions

PCIC-2014-38 Lithium-Ion Battery Safety Requirements for Marine Installations
Michael Roa American Bureau of Shipping

Conde Consuelo U.S. Coast Guard
Andre Douglas U.S. Coast Guard

Wednesday September 10, 2014 – INTERNATIONAL TECHNICAL SESSION II – San Francisco Marriott Marquis - YB Nob Hill
8:15 a.m. – 11:15 a.m. Presiding – Wolfgang Berner

PCIC-2014-40 IEC 60079-14 “Electrical Installations Design, Selection and Erection”
Brian Keane Eaton’s Cooper Crouse Hinds
Gerhard Schwarz GSA Consulting
Peter Thurnherr thuba Ltd

PCIC-2014-41 Area Classification is not a Copy and Paste Process
Estelillo Rangel Junior Petrobras
Aurélio Moreira Luiz Petrobras
Hilton Leão de P. M. Filho Petrobras
<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
</table>
| PCIC-2014-42 | Case Study: Simultaneous Optimization of Electrical Grid Stability and Steam Production | Scott Manson, Schweitzer Engineering Laboratories, Inc. 
Matt Checksfield, Powerplan Engineers Pty Ltd. 
Peter Duffield, Rio Tinto 
Abdel-Rahman Khatib, Schweitzer Engineering Laboratories, Inc. |
| PCIC-2014-43 | Pre-emptive Arc Fault Detection Techniques in Switchgear - Part III, From the Laboratory to Practical Installation | G. Amjad Hussain, Aalto University 
Muhammad Shatiq, Aalto University 
John A. Kay, Rockwell Automation 
Matti Lahtonen, Aalto University |
| PCIC-2014-44 | Ground Fault Protection of Personnel in Industrial Locations Using the New UL 943C | Nehad El-Sherif, Littelfuse Startco 
Rick Mendler, Phillips 66 
John Trotte, Phillips 66 
Ajay Pathak, Littlefuse, Inc. |
| PCIC-2014-45 | Detecting and Predicting Arc Flash Events at Low Operational Loads | Ross Kennedy, QH Group Ltd |
| PCIC-2014-46 | Oilfield Electric Power Distribution | Robert A. Durham, THEWAY Labs 
Thomas R. Brinner, PM&D Engineering, Inc. |
| PCIC-2014-47 | Transient Recovery Voltage Risks and Mitigation Due to Current Limiting Reactor Switching for Oil Sands Fault Reduction | Peter C. Pietramala, Eaton Corporation 
Paul Pak, Suncor Energy 
David D. Shipp, Eaton Corporation 
Thomas J. Dionise, Eaton Corporation |
| PCIC-2014-48 | MV-105 Cable - Field Acceptance Testing - A Cable Manufacturer’s Perspective | E. J. (Bart) Bartolucci, The Okonite Company 
Mark Thiele, The Okonite Company |
| PCIC-2014-49 | Electrical Hazardous Area Classification Design as a Basis for Safer Operations | Allan Bozek, EngWorks, Inc. 
Cecil Gordon, Cenovus Energy Inc. 
Niki Phillips, Cenovus Energy Inc. |
| PCIC-2014-50 | Conduit Seals in Hazardous Locations - An Ongoing Safety Issue the Past and the Future | Nic Leblanc, Shell Canada Products 
Wolfgang Berner, R. Stahl, Ltd. 
Paul Oglivie, Shell Canada Products |
| PCIC-2014-51 | Disaster Recovery: What to do After the Storm | Chuck Yung, EASA 
Jim Bryan, EASA |
| PCIC-2014-52 | Building the World’s Longest Heated Pipeline a Technology Application Review | Franco Chakkalakal, Pentair Thermal Management 
Marty Hamill, C/o Petroceltic International plc 
Jim Beres, Pentair Thermal Management |
Oscar Ramirez, Enbridge Pipelines, Inc. 
Alex Ustinovich, Enbridge Pipelines, Inc. |
| PCIC-2014-54 | Long Cable Applications from a Medium Voltage Drives Perspective | Matt Smochek, Siemens Industry, Inc. 
Tony Pollice, Siemens Industry, Inc. 
Mukul Rastogi, Siemens Industry, Inc. 
Mark Harshman, Siemens Industry, Inc. |