

# 2024 IEEE-IAS-PCIC CONFERENCE TECHNICAL PROGRAM

The following is a list of technical papers that will be presented at the 2024 IEEE PCIC Conference in Orlando, Florida. Any last-minute changes to the final program can be found on the PCIC 2024 Orlando Conference App.

All paper presentations take place at the Hyatt Regency Orlando.

GENERAL TECHNICAL SESSION I	
Monday, September 16, 2024 – 8:00 a.m. to 11:15 a.m.	Presiding: Kevin Peterson, PCIC Chair

PCIC-2024-01	<b>IEEE 1017 Family of Standards – A Major Update</b> Robert Durham Cameron Chung Marcus O. Durham	THEWAY Labs Alberta Electric System Operator THEWAY Labs
PCIC-2024-02	<b>Lithium-Ion Battery Systems: Risk Management, Operations and Maintenance Considerations.</b> Donald Dunn	Waldemar S. Nelson and Company
PCIC-2024-03	<b>A Comparison of Protection Based Arc Flash Mitigation Techniques</b> Craig Wester Donald Elliott Wayne Hartmann David Virost	GE Vernova NorthStar Energy Services GE Vernova Colonial Pipeline

GENERAL TECHNICAL SESSION II	
Monday, September 16, 2024 – 2:00 p.m. to 5:00 p.m.	Presiding: Paul Sullivan, PCIC Vice-Chair

PCIC-2024-04	<b>Storage of Electricity in the Form of Electrical Energy Using Hydrogen</b> Rehanul Hasan Merwyn D'Souza David Hohenstein Rick Mendler.	Pepperl+Fuchs, Inc. Worley Pepperl+Fuchs, Inc. PIP Emeritus
PCIC-2024-05	<b>The Path of Decarbonization through Electrification, A Refinery Case Study and Lessons Learned.</b> Giovanni Parra Luis Espinoza Sina Ghods Alia Hardy	Fluor Enterprises, Inc. Marathon Petroleum Corp. Fluor Enterprises, Inc. Marathon Petroleum Corp.
PCIC-2024-06	<b>Electric Drivers in LNG Liquefaction Plants: Design Aspects and Challenges</b> Navid Binesh Carlo Arrioja Matt Taher	ABB ABB Bechtel Energy, Inc.

CHEMICAL TECHNICAL SESSION I	
Monday, September 16, 2024 – 2:00 p.m. to 5:00 p.m.	Presiding: Jason Obermeyer, Chair

PCIC-2024-07	<b>Petrochemical Plant Turnaround Case Study: Planning, Executing, Findings and Lessons Learned</b> Maria Clara Saraiva Luiz Kehl	Braskem America Inc. Braskem America Inc.
PCIC-2024-08	<b>Analysis of Power Quality Monitoring Methods in Industrial Distribution Systems</b> Farhana Choudhury Murty V.V.S. Yalla Gary Rinaldi	Electro Industries/Gauge Tech Electro Industries/Gauge Tech Electro Industries/Gauge Tech
PCIC-2024-09	<b>The Drive to Electrify: Benefits of Electrification of Fossil Fuel-Fired Process Heating Equipment</b> David TenEycke Ben Johnson	Thermon Thermon (Retired)

**INTERNATIONAL TECHNICAL SESSION I****Monday, September 16, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding: Allen Kachurovski, Chair**

- PCIC-2024-10 The Impact of Changing Medium Voltage Switchgear Standards on the Application of Dedicated Motor Buses**  
Rakan El-Mahayni Saudi Aramco  
Abdulwahab Al-Abdulwahab Saudi Aramco  
Cory Helfrich Saudi Aramco
- PCIC-2024-11 Overvoltages in Medium Voltage Industrial Systems Associated with Switching High Voltage Transformers Connected Through Insulated Cables**  
Leonardo de Carvalho Rocha Petrobras  
Thiago Trezza Borges Petrobras  
Fabrício Las Casas Petrobras
- PCIC-2024-12 Electrical Obsolescence Management: Proactive & Data Driven Mitigation Strategies**  
Ritchie Pragale Saudi Aramco  
Faisal Mansour Saudi Aramco  
Abdulaziz Mubayedh Saudi Aramco  
Amar Patel Saudi Aramco

**MIDSTREAM TECHNICAL SESSION I****Monday, September 16, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding: Manish Verma, Chair**

- PCIC-2024-13 Trans Alaska Pipeline System – Improved Safety and Reliability Via Main-Tie-Main, Arc-Flash, and Fast-Bus Protection Schemes Using IEC 61850 over a Software-Defined Network**  
Tanushri Doshi Schweitzer Engineering Labs, Inc.  
Dwight Anderson Schweitzer Engineering Labs, Inc.  
Kevin Lythgoe Alyeska Pipeline Service Company  
Kenny Sheffler Schweitzer Engineering Labs, Inc.
- PCIC-2024-14 Design Considerations for Co-Locating PV farms Near Pipelines**  
Alonzo Alvarez Meola Chevron Pipeline & Power  
Zach Mckinney Chevron Technical Center  
Irfan Khan TEXAS A&M  
Giancarlo Leone SR3 Engineering  
Henry (Hank) Clark, Jr. Chevron Pipeline & Power
- PCIC-2024-15 Use of Predictive Analytics on A Critical Heated Pipeline**  
Akshat Singh nVent Thermal Management  
Gustavo Saldarriaga nVent Thermal Management

**REFINING TECHNICAL SESSION I****Monday, September 16, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding Patrick Loupe, Vice-Chair**

- PCIC-2024-16 Power Management System for a 4 GW Integrated Gasification Combined-Cycle Generation Facility**  
Abdel Rahman Khatib Schweitzer Engineering Laboratories, Inc.
- PCIC-2024-17 Alarm Management Fundamentals – What is the Impact of Electrical Equipment Automation on Industrial Control Systems**  
Donald Dunn Waldemar S. Nelson and Company  
Nicholas Sands DuPont
- PCIC-2024-18 Electrical Switchgear Protection and Control Scheme Design Techniques to Improve Security and Dependability Refining**  
Pratik Patel Schweitzer Engineering Laboratories, Inc.  
Sundaravaradan Ananthan Schweitzer Engineering Laboratories, Inc.  
Rikesh Shah Schweitzer Engineering Laboratories, Inc.  
William Reed Samsung Electronics

**EMERGING TECHNOLOGIES SESSION I****Tuesday, September 17, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Greg Clement, Chair**

- PCIC-2024-19 Returns of Experience and Recommendations for Mechanical Integration of Large 2-pole Variable-Speed Electric Motors for High Availability of LNG Compression Trains**  
 Lionel Durantay GE Vernova PC  
 Alain Gelin TotalEnergies  
 Wissam Moubarak GE Vernova PC  
 Edouard Thibaut TotalEnergies
- PCIC-2024-20 High Voltage Circuits in Large Industrial Facilities.**  
 Matthew Murray Bechtel Energy Inc.  
 Matt Armand Bechtel Energy Inc.  
 Dane Martindale The Okonite Company
- PCIC-2024-21 The Advancement of Safety Features for Industrial Power System Operations and Control**  
 Chetan Kansagara Schweitzer Engineering Laboratories, Inc.  
 Paulo Franco Schweitzer Engineering Laboratories, Inc.  
 Anil Pandya Tengizchevroil  
 Bhairavi Pandya Actalent Services

**MARINE INDUSTRY TECHNICAL SESSION I****Tuesday, September 17, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Ethan Dong, Chair**

- PCIC-2024-22 Marine Radar Electromagnetic Environmental Effects [E3] on Shipboard and Land Based ASD Operation: Problems and Solutions**  
 Gary Skibinski Rockwell Automation  
 Jim Valasek Rockwell Automation
- PCIC-2024-23 Lessons Learned from a 35KV Submarine Power Cable Replacement**  
 Miguel Sarris Doris Group  
 Jeff Whipple Doris Group
- PCIC-2024-24 Replacing Electromechanical Relays with Microprocessor Relays to Provide Thermal Protection for Motors**  
 Bishoy Azer Schweitzer Engineering Laboratories, Inc.  
 Krithika Bhuvaneshwaran Schweitzer Engineering Laboratories, Inc.  
 Derrick Haas Schweitzer Engineering Laboratories, Inc.  
 Jim Payne Phillips 66  
 Ganga Ramesh Schweitzer Engineering Laboratories, Inc.

**PRODUCTION TECHNICAL SESSION I****Tuesday, September 17, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Matthew Marchiano, Chair**

- PCIC-2024-25 Oil Field Electrification – Evolving Distinct Metered Sites to a Utility Scale Grid**  
 Jed Chute ExxonMobil - XTO Energy  
 Carson Bates NEI Electric Power Engineering, Inc  
 Ross Eldridge NEI Electric Power Engineering, Inc.  
 Joe Marquardt ExxonMobil
- PCIC-2024-26 Electrical Distribution System Optimization Using Reliability Analysis**  
 Carlos Ramirez Franco Occidental Petroleum (OXY)  
 Alexander Novoa Occidental Petroleum (OXY)  
 Fares Romanos Occidental Petroleum (OXY)
- PCIC-2024-27 A Review of Metering Safety Concerns**  
 John Nelson Retired

SAFETY TECHNICAL SESSION I	
Tuesday, September 17, 2024 – 8:15 a.m. to 11:15 a.m.	Presiding: Tony Parsons, Chair

PCIC-2024-28	<b>Do Arc Mitigating Systems Really Work?</b> John Kay Juha Arvola Mikko Manninen	Rockwell (Retired) Arcteq Relays Ltd. Arcteq Relays Ltd.
PCIC-2024-29	<b>Simplifying the Implementation of Machine LVMCC</b> Roberto Marques Jonathan B Johnson James Newbern Gabriel Rivera	Rockwell Automation Rockwell Automation Rockwell Automation Corteva Agriscience
PCIC-2024-30	<b>Load-Side Voltages on Open Low-Voltage Circuit Breakers Due to Parasitic Capacitive Coupling</b> William Brown Marc Foster	Schneider Electric Schneider Electric

MINING TECHNICAL SESSION I	
Tuesday, September 17, 2024 – 8:15 a.m. to 11:15 a.m.	Presiding: Hélder de Paula, Chair

PCIC-2024-31	<b>Harmonic Suppression for Matrix Converter Based AC Drives</b> Galina Mirzaeva Yuan Liu	The University of Newcastle, Australia The University of Newcastle, Australia
PCIC-2024-32	<b>Tool for the Assessment of the Savings in the Cable Acquisition When Employing DC Transmission in Long Distance Drives</b> André Alzamora Marco T. A. Évo Hélder de Paula Caio Eduardo Silva	Federal University of Uberlândia (UFU) Federal University of São João del-Rei (UFSJ) Federal University of Uberlândia (UFU) Federal University of São João del-Rei (UFSJ)
PCIC-2024-33	<b>Reliability Analysis of IGBT Modules of Multilevel Inverters Operating in Hostile Environments</b> Caio Eduardo Silva André M. Alzamora Hélder de Paula Gabriela Lígia Reis	Federal University of São João del-Rei (UFSJ) Federal University of Uberlândia (UFU) Federal University of Uberlândia (UFU) Federal Institute of Southeast Minas Gerais

EMERGING TECHNOLOGIES SESSION II	
Wednesday, September 18, 2024 – 8:15 a.m. to 11:15 a.m.	Presiding: Richard Anderson, Vice-Chair

PCIC-2024-34	<b>Performance and Drive Characteristics of Slotless Axial Flux Motors</b> Claudio Schmitz	WEG
PCIC-2024-35	<b>Optimization Techniques of Substation Capability Applying Natural Ester Liquid-Filled Transformers</b> Ray Catlett Roberto Ignacio da Silva Kevin R. Wirtz	System Optimization Group Cargill Cargill
PCIC-2024-36	<b>Enhancing Success in Carbon Capture Integration with Existing Industrial Facilities: Electrical Challenges and Strategies.</b> Atul Arunkumar Shenoy Carles Miller David Brunnert Manish Verma	Burns & McDonnell Burns & McDonnell Energy Transfer TMEIC

**MARINE INDUSTRY TECHNICAL SESSION II****Wednesday, September 18, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Karen Johnson, Vice-Chair**

- PCIC-2024-37 Four Quadrant Medium Voltage Drives**  
Mukul Rastogi Innomotics LLC  
Liviu Mihalache Innomotics LLC
- PCIC-2024-38 Modernization of the Existing Low and Medium Voltage Switchgear and MCCs**  
Seth Kravetz Qualas Services  
Ken Agent East Kentucky Power  
Albert Livshitz Qualas Services
- PCIC-2024-39 Why are Class I/Division 1 and Zone 1 Induction Machines Employed Less and Less in Industries Today?**  
Raj Mistry Siemens - retired  
William Lawrence FM Approvals  
Bharat Mistry GE – retired

**PRODUCTION TECHNICAL SESSION II****Wednesday, September 18, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Brandon Cassimere, Vice-Chair**

- PCIC-2024-40 Relay-Based Electrical Signature Analysis for Incipient Motor Failure Detection – Field Successes**  
Christine Crites GE Grid Solutions  
Balakrishna Pamulaparthi GE Grid Solutions  
Ravindranauth (Mike) Ramlachan GE Grid Solutions  
Kola Y V Bharav Reddy Indian Oil Corporation, Ltd.
- PCIC-2024-41 Connectors, Connectors, Connectors – Aren't They all the Same?**  
Lee Herron BURNDY LLC, A Hubbell Company  
Mark R. Hilbert MR Hilbert, LLC  
Daleep Mohla DCM Electrical Consulting  
Greg Stienman ABB Installation Products
- PCIC-2024-42 Settings Management with IED – Integrated Reporting Leads to Enhanced System Benefits**  
Kamran Heshami Schweitzer Engineering Laboratories, Inc.  
Michael T. Mendiola Chevron  
Nilushan K. Mudugamuwa Tengizchevroil  
Matthew Watkins Schweitzer Engineering Laboratories, Inc.

**SAFETY TECHNICAL SESSION II****Wednesday, September 18, 2024 – 8:15 a.m. to 11:15 a.m.****Presiding: Jim Phillips, Vice Chair**

- PCIC-2024-43 Changes in IEEE C37.20.7 that Impact Internal Arc Testing and Medium Voltage MCCs**  
Stan Simms Eaton  
Richard Bhalla Eaton  
Thomas A. Farr Eaton  
Kyle Harrison Eaton
- PCIC-2024-44 The Art and Science of Switching Orders**  
Brian Cassidy Chevron  
Zach McKinney Chevron
- PCIC-2024-45 Intelligent Lighting Control for Harsh and Hazardous Areas**  
Adam Nugent Eaton  
M. Lee Perry Jr. BASF  
Tony Trim Eaton  
Shoumi Sen Eaton

<b>MINING TECHNICAL SESSION II</b>	
<b>Wednesday, September 18, 2024 – 8:15 a.m. to 11:15 a.m.</b>	<b>Presiding: Nicole Neuman, Vice-Chair</b>

- PCIC-2024-46 Complying with NFPA 70B and Minimizing the Total Cost of Ownership of Distribution Switchgear using Condition Monitoring Technologies and Data Analytics**  
Harshavardhan Karandikar ABB Inc.  
Danny Kliebert The Dow Chemical Company  
Marcelo Valdes ABB Inc.
- PCIC-2024-47 Lessons Learned Commissioning a Relay-Based Synchronous Motor Excitation Control System**  
Christine Crites GE Grid Solutions  
Kenneth W. Apfelbeck Apfelbeck Electronics  
Robert Muziol GE Grid Solutions
- PCIC-2024-48 On-Load Tap Changer (OLTC) Selection and Optimization in Large Power Transformers**  
Shankar Nambi Bechtel Energy, Inc.  
John K John Virginia Transformer Corp  
Mohit Kumar Bechtel Energy, Inc.  
Kannan Veeran Virginia Transformer Corp

<b>CHEMICAL TECHNICAL SESSION II</b>	
<b>Wednesday, September 18, 2024 – 2:00 p.m. to 5:00 p.m.</b>	<b>Presiding: Robbie McElveen Vice-Chair</b>

- PCIC-2024-49 Lifetime Analysis of Copper and Aluminum Squirrel Cage Rotor of Asynchronous Machines**  
Fredemar Runcos WEG  
Fernando Teles Farias Neto WEG  
Fernando Roberto Spézia WEG  
Alexandre Wentz WEG
- PCIC-2024-50 Turbine Replacement with Electrical Drivers – Evaluating Options**  
Hartmut Walter Innomotics  
Mark Chatburn Burns & McDonnell  
Bart Sauer Innomotics  
Gijs van Maanen Innomotics
- PCIC-2024-51 Coupled Electromechanical Analysis for Torsional Design of Electric Powertrains**  
Timo Holopainen ABB Oy  
Jukka Järvinen ABB Inc.  
Tommi Ryyppö ABB Oy

<b>INTERNATIONAL TECHNICAL SESSION II</b>	
<b>Wednesday, September 18, 2024 – 2:00 p.m. to 5:00 p.m.</b>	<b>Presiding: Rakan El-Mahayni, Vice-Chair</b>

- PCIC-2024-52 Advantages of Paralleling Transformers at Industrial Sites with a Communication-Based Paralleling Method**  
Tomas Branch Hubbell - Beckwith Electric  
Ravi Manda Hubbell - Beckwith Electric  
Murty V.V.S. Yalla Hubbell - Beckwith Electric
- PCIC-2024-53 Application of IEEE 1584 to IEC Equipment**  
Cory Helfrich Saudi Aramco  
Ahmed S Alabidi Saudi Aramco  
Ahmad A Al-Shibli Saudi Aramco
- PCIC-2024-54 Partial Discharge Investigation in Electric Machines Exposed to Ambient Stresses During Industrial Operations**  
Waqar Hassan Universiti Tenaga Nasional  
Azrul Mohd Ariffin Universiti Tenaga Nasional  
Keyvan Firuzi Middle East Technical University  
Ghulam Amjad Hussain University of Dubai  
John A. Kay Independent Consultant

**MIDSTREAM TECHNICAL SESSION II****Wednesday, September 18, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding: Jeff Gaspar, Vice-Chair**

- PCIC-2024-55 Power System Design Considerations for an Island Combined Cycle Power Plant for an Electrical LNG Facility**  
Gautami Bhatt  
Sangyoun Kim  
Azam Kurji  
Bechtel Energy  
Bechtel Manufacturing & Technology  
ExxonMobil Global Projects
- PCIC-2024-56 Sync or Async – How to Start a Synchronous Motor Driving Reciprocating Compressor.**  
Mark Chisholm  
Mark Kaupa  
Jacques Leger  
Luiz Cláudio Santos  
WEG Electric Corp  
Linde Engineering Americas  
Electric Machinery Co. LLC  
WEG Automation
- PCIC-2024-57 Can High Efficiency LV Motors be Rewound While Maintaining the Original Premium Efficiency Levels?**  
Henk DeSwardt  
Timken

**REFINING TECHNICAL SESSION II****Wednesday, September 18, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding: Giovanni Parra, Chair**

- PCIC-2024-58 Understanding the Relationship Between Total Harmonic Distortion and Total Demand Distortion in IEEE Std 519-2022: A Practical Discussion for Compliance Evaluations**  
Michael McGraw  
Alexander Hovenaars  
John Greenwald  
Joseph Kotria  
Mirus International  
Mirus International  
SM Energy Inc.  
McCreary & Associates, Inc.
- PCIC-2024-59 Replacing Lead Acid and Nickel Cadmium Stationary Batteries with Lithium Ion – It's Not a Simple Swap**  
Michael O'Brien  
Miles Borcherdt  
Shannon Harris  
Hila Shadravan  
Exponential Power  
Exponential Power  
Exponential Power  
Exponential Power
- PCIC-2024-60 State of the Art Technologies for Liquid Immersed Power Transformer Online Monitoring**  
Hakim Dulak  
Gary Hoffman  
Trent Williams  
Advanced Power Technologies  
Advanced Power Technologies  
Advanced Power Technologies

**MINING TECHNICAL SESSION III****Wednesday, September 18, 2024 – 2:00 p.m. to 5:00 p.m.****Presiding: Galina Mirzaeva, Immediate Past Chair**

- PCIC-2024-61 Implementing Cybersecurity for Industrial-Connected Products**  
Wesley Van Hill  
Nathan Laan  
Rahul Gupta  
Alexander Koehler  
nVent Thermal LLC  
nVent Thermal LLC  
UL Solutions  
UL Solutions
- PCIC-2024-62 Reliable and Efficient High Power DC Distribution for Hydrogen Electrolysis**  
Mohit Kumar  
Kevin Pretorius  
Terry Tadlock  
Nandhakumar Vijayakumar  
Bechtel Energy, Inc.  
ABB Switzerland Ltd.  
Bechtel Energy, Inc.  
ABB Switzerland Ltd.
- PCIC-2021-63 Motor Service Life vs. Design Life**  
Mark Hodowanec  
Ian Bahnsen  
Nicholas Lang  
Anthony Soellner  
Innomotics LLC  
Innomotics LLC  
Innomotics LLC  
Innomotics LLC