

FINAL PROGRAM



Electrical Transmission & Substation Structures Conference

Innovating for Critical Global Infrastructure

October 2–6, 2022

Orlando, Florida



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SUNDAY, OCTOBER 2, 2022

8:00 a.m.–4:00 p.m.	Exhibitors Move-In
11:15 a.m.–Noon	Student Scholarship Orientation (Wekiwa 3/4/5)
11:00 a.m.–6:00 p.m.	Registration
1:00 p.m.–5:30 p.m.	Pre-Conference Workshop (ticket required)
5:30 p.m.–7:00 p.m.	Grand Opening Reception/Exhibit Hall Opens

MONDAY, OCTOBER 3, 2022

7:00 a.m.–6:00 p.m.	Registration
7:30 a.m.–8:00 a.m.	Breakfast
8:10 a.m.–9:30 a.m.	Opening Plenary Session with Keynote Address
9:00 a.m.–4:00 p.m.	Exhibit Hall Hours
9:30 a.m.–10:15 a.m.	Refreshment Break in Exhibit Hall
10:15 a.m.–12:00 p.m.	Technical Session 1
12:00 p.m.–1:30 p.m.	Lunch in Exhibit Hall
1:30 p.m.–3:15 p.m.	Technical Session 2
3:15 p.m.–4:00 p.m.	Refreshment Break in Exhibit Hall
4:00 p.m.–5:20 p.m.	Technical Session 3
5:30 p.m.–7:00 p.m.	Networking Reception on Hotel Patio (weather permitting)

TUESDAY, OCTOBER 4

7:00 a.m.–6:00 p.m.	Registration
7:30 a.m.–8:00 a.m.	Breakfast
8:10 a.m.–9:30 a.m.	Technical Session 4
9:00 a.m.–7:00 p.m.	Exhibit Hall Hours
9:30 a.m.–10:15 a.m.	Refreshment Break in Exhibit Hall
10:15 a.m.–12:00 p.m.	Technical Session 5
12:00 p.m.–1:30 p.m.	Lunch in Exhibit Hall
1:30 p.m.–3:15 p.m.	Technical Session 6
3:15 p.m.–4:00 p.m.	Refreshment Break in Exhibit Hall
4:00 p.m.–5:20 p.m.	Technical Session 7
5:30 p.m.–7:00 p.m.	Networking Reception in the Exhibit Hall

WEDNESDAY, OCTOBER 5

7:00 a.m.–1:30 p.m.	Registration
7:30 a.m.–8:00 a.m.	Breakfast
8:10 a.m.–9:30 a.m.	Technical Session 8
9:00 a.m.–1:30 p.m.	Exhibit Hall Hours
9:30 a.m.–10:15 a.m.	Refreshment Break in Exhibit Hall
10:15 a.m.–12:00 p.m.	Technical Session 9
12:00 p.m.–1:30 p.m.	Lunch in Exhibit Hall
1:30 p.m.–2:50 p.m.	Technical Session 10
1:45 p.m.–5:00 p.m.	Exhibitor Move-Out
2:50 p.m.–3:35 p.m.	Refreshment Break
3:35 p.m.–5:00 p.m.	Technical Session 11
5:00 p.m.–5:20 p.m.	Conference Closing

THURSDAY, OCTOBER 6

8:00 a.m.–Noon	Golf Scramble–Shingle Creek Golf Club
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Proceedings

Instructions on how to download the online proceedings from the ASCE Library can be found in the conference app under *Handouts*. Conference attendees will be able to access the on-line proceedings until the first week of December 2022.

STEERING COMMITTEE

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CONFERENCE PROGRAM

SUNDAY, OCTOBER 2

11:00 a.m.–6:00 p.m. | Registration | Panzacola Foyer
1:00–5:30 p.m. | Pre-Conference Workshop | Panzacola Ballroom | 4.0 PDHs

Tutorials on Loading and Design of Transmission & Distribution Structures

(Extra ticket required)

Pre-conference workshop sponsored by:



As perhaps the most important element of critical global electric power infrastructure, the reliability and resiliency of our power delivery system (lines, substations, and structures) is paramount. Do you have the knowledge and tools needed to face that challenge? This workshop is designed to provide attendees a valuable opportunity to learn directly from industry experts on how to:

- Implement ASCE/SEI Standards and Manuals of Practice in real-life applications
- Effectively develop loads from the probabilistic wind, ice and other loading events
- Apply those loads to different types of structures and components
- Develop a better understanding of the design strength equations in the Standards and MoPs

Technical knowledge in these areas is constantly improving and requires constant updating, so you will not want to miss this valuable opportunity to learn about the Standards and Manuals of Practice used in our industry.

Moderator:

- Wes Oliphant, P.E., F.SEI, F.ASCE, Exo

Presenters:

- **Otto Lynch, P.E., F.SEI, F.ASCE**, *Power Line Systems, LLC* – Development of Loadings: ASCE/SEI MoP #74
- **William J Reisdorff, Jr., P.E., M.ASCE**, *Valmont* – Structure Design – Tubular Steel Poles: ASCE/SEI Standard 48
- **Michael Miller, P.E., F.SEI, F.ASCE**, *Exo* – Structure Design – Lattice Steel Towers: ASCE/SEI Standard 10
- **Wesley Oliphant, P.E., F.SEI, F.ASCE**, *Exo* – Structure Design – Wood Poles: ASCE/SEI MoP #141

Wrap-Up/Final Q&A and Adjourn – Wes Oliphant

5:30 p.m.–7:00 p.m. | Grand Opening Reception | Sebastian Ballroom Exhibit Hall

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MONDAY, OCTOBER 3

7:00 a.m. – 6:00 p.m. | Registration | Panzacola Foyer
7:30 a.m. – 8:00 a.m. | Breakfast | Panzacola Foyer

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8:10 a.m. – 9:30 a.m. | Opening Plenary Session with Keynote Address | Panzacola Ballroom

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Join us for our keynote speaker **Matt Parker**, known as the Stand-up Mathematician, is an award-winning YouTuber, a public speaker, and author. His book *Humble Pi* (Penguin USA 2020) was a #1 international bestseller. He received the JPB Math Communication Award in 2018 from a consortium including the American Mathematical Society. Matt is a member of the advisory committee for the Museum of Math in NYC.

Matt is a host on the Science Channel series *Outrageous Acts of Science* and his YouTube videos on the Stand-up Maths and Numberphile channels have amassed over 100 million views. In 2018 Matt calculated the number pi live on-stage in front of a sold-out Royal Albert hall using real pie. He is also the first person to use an overhead projector at the Hammersmith Apollo since Pink Floyd.

Gene Wilhoite Innovations in Transmission Line Engineering Award

Presented to an individual for significant contributions to the advancement of the art and science of transmission line engineering.



2022 Award Recipient: Meihuan Nancy Fulk, Ph.D., P.E., M.ASCE

Nancy Fulk has a B.S. in Structural Engineering from Tongi University in Shanghai, China, and a Ph.D. in engineering from Louisiana Tech

University. Nancy's consistent and meaningful participation in the development of ASCE/SEI Manuals of Practice and Standards related to transmission structures provides an example of her willingness to participate in and share the knowledge and experience she has brought to the industry. She has also served on several IEEE and CIGRE technical committees. Another key criterion for the award is that the recipient has "made a

significant contribution to the advancement of the arts and science of transmission line engineering". Nancy was a key member of AEP's Team that developed the BOLD Concept- Mechanical Considerations for the Design of a Compact EHV Transmission Line. This has been viewed globally as a significant contribution to the industry with the American Electric Power team she served on besting 26 other tower designs from around the world to receive the 2017 CIRGE-KEPCO International Tower Design Award. As with all past recipients, Nancy has set a high bar in her efforts to further the design of transmission line structures and set an exemplary ethical and professional standard for others to follow.



2021 Award Recipient: Majid R.J. Farahani, P.E., M.ASCE

Majid Farahani received both his B.S. and M.S. in Civil Engineering with emphasis on Structures from University of Evansville, IN in 1987 & 1989

respectively. Majid's strong participation in a multitude of ASCE/SEI Manuals of Practice and Standards committees provides a strong example to all for what an engaged member looks like. His efforts went above and beyond the norm in developing and organizing the Western Civil/Transmission Engineering Training, a no-cost conference. He also focused on engineering and training programs at LCRA. Majid's willingness to share his knowledge with associates and peers are characteristics that we should all strive to embody.

9:30 a.m.-10:15 a.m. | Refreshment Break, Sebastian Ballroom Exhibit Hall

Sponsored by: **FABRIMET**

10:15 a.m.-12:00 p.m. | Session 1: Wildfires | Panzacola Ballroom

Session Leads:

- **Ron Carrington, P.E., M.ASCE and Michael Miller, P.E., F.SEI F.ASCE**

Although not manning the front lines, the utility industry is doing its part to fight wildfires. Risk mitigation and fire hardening are the engineering equivalent to hotshot crews, helicopters, and fire retardant to protect the power system. This session will give you a glimpse into how you might address system-wide impacts of climate change facing your system.

Evaluation of Structural Materials to Maximize Infrastructure Survivability in Wildfires, Clinton Char, Brian Flynn, Sergio Arambula, Southern California Edison

Fire Testing of Concrete and Steel Electric Utility Poles, Fouad Fouad, University of Alabama at Birmingham; Mark Ackerman, University of Alberta; Ronald Barnett, Valmont Industries

Minimizing Wildfire Risks Through Advanced Structural Inspection and Modelling Techniques, Hannling Shaw, John Makkar, Southern California Edison

Does compliance with minimum regulatory standards adequately mitigate wildfire risk? Ryan Bliss, TRC; Bryce DeQuoy, RDQ; Brian McDonald, Exponent; John Birch, PG&E

12:00 p.m.-1:30 p.m. | Lunch in Sebastian Ballroom Exhibit Hall

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1:30 p.m.-3:15 p.m. | Session 2: Case Studies/Projects | Panzacola Ballroom

Session Leads:

- **Marlon Vogt, P.E., F.SEI M.ASCE and Dana Crissey, P.E., M.ASCE**

"Veni, vidi, vici (I came, I saw, I conquered)" – Julius Caesar. Old Julius must've been an engineer, since he clearly knew that there is nothing more satisfying than seeing a difficult project constructed. Listen as these authors weave fascinating tales of long spans, tall structures, high clearances, inaccessible terrain, helicopters, a reestablished estuary and of course regulatory and agency compliance. *Ut est rerum omnium magister usus.* (Experience is the teacher of all things).

380m Ultra Long span crossing tower design, fabrication and construction, Yong Guo, Zhejiang Electric Power Design Institute Co. LTD; Gangping Dai, Zhejiang Shengda Steel Tower Co; Fuping Duan, Zhejiang Power Transmission and Transformation Engineering Co. LTD; Xiaofeng Ge, Zhejiang Shengda Steel Tower Co., Ltd; Dachang Zhang, Nanjing TECH University; Bill Kong, BKT Consultants Ltd

The Badger Coulee Transmission Line: Overcoming the Challenges of Wisconsin, Griffen Erickson, Electrical Consultants, Inc.; Michael Bradley, Jacob Valentine, American Transmission Company; Cory Jacobsen, Electrical Consultants, Inc.

A Tall Order, Duke Energy's NCSPA Project. E.J. Benton, Pickett and Associates, Inc.; Ganga Pontula, John Taylor, Duke Energy Progress; Ben Wadsworth, Pickett and Associates, Inc.

Protecting Steel Poles and the Environment! SR529 Mitigation – A Case Study on Environmental Factors and Steel Structure Preservation, Grant Leaverton, Exo, Gordon Hayslip, Snohomish PUD; Aziz Haq, Snohomish PUD; Justin Curtis, Exo



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3:15 p.m. – 4:00 p.m. | Refreshment Break in Sebastian Ballroom Exhibit Hall

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**4:00 p.m.–5:20 p.m. | Session 3:
Design/Analysis 1 | Panzacola Ballroom**

Session Leads:

- **Ron Carrington, P.E., M.ASCE** and **Otto Lynch, P.E., F.SEI, F.ASCE**

The idiom ‘The devil is in the detail’ certainly applies to this session. Notice the lengths to which these authors went to successfully complete their projects with no detail overlooked. We’ll all learn about development and design of a base shoe connection for latticed tower foundations, an innovative tubular steel 3-D frame for high loads and long spans, and design nuances of foundations for power transformers.

If the Shoe Fits: Design of 765-kV Tower Base Plates, Adam Bowland, DiGioia Gray and Associates; Josh Wright, Aaron Darby, American Electric Power

A Structural Engineer’s Perspective on Transformer Installations, Daniel Cuffman, Benjamin Roberts, American Electric Power

Tubular 3D Frames for Long Span Transmission Structures, Anthony Hansen, Donghui Yuan, William Reisdorff, Diaaeldin Mohamed, Valmont Utility

5:30 p.m.–7:00 p.m. | Networking Reception Gatlin Terrace (weather permitting)

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TUESDAY, OCTOBER 4

7:00 a.m.–6:00 p.m. | Registration Panzacola Foyer

7:30 a.m.–8:00 a.m. | Breakfast | Panzacola Foyer

Sponsored by: **HUGHES HB BROTHERS**

**8:10 a.m.–9:30 a.m. | Session 4:
Lattice Towers | Panzacola Ballroom**

Session Leads:

- **Joel Bryant, P.E., M.ASCE** and **Leon Kempner, Jr., Ph.D., P.E., F.SEI, M.ASCE**

“Not your grandfather’s latticed towers (though I bet his are still in-service).” Authors in this session will remind you why latticed towers were the structure of choice 50 years ago and remain

a compelling choice today. Highlights not to be missed include tower testing during a pandemic, fall protection and predictive modeling of transmission lines considering tower fragility

A Renaissance in Tower Testing, Katherine Bridwell, Ron Carrington, John Siegel, POWER Engineers, Inc.

Fall Protection and Walkability Analytical Methodology for Lattice Towers, Sathish Konduru, Westwood Professional Services, Rebecca Knowlton-Fournier, Stantec

Fragility Analysis of Transmission Tower-Line System Under Multiple Environmental Loadings, William Hughes, Wei Zhang, Qin Lu, University of Connecticut

9:30 a.m.–10:15 a.m. | Refreshment Break in Sebastian Ballroom Exhibit Hall

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10:15 a.m.–12:00 p.m. | Session 5: Managing Aging Infrastructure | Panzacola Ballroom

Session Leads:

- **Mary Jane McMillen, P.E., M.ASCE** and **David Todd, P.E., F.SEI, M.ASCE**

The authors in this session show off their creativity in addressing challenges with assessing and analyzing aging and historic transmission lines. And sadly, even when a line that has served us well for many years must be replaced, these authors demonstrate that you can still flex your creative muscles when it is time to say goodbye to old friends.

Test Methods for Serviceability Assessment of Non-Traditional Steel Support Structures, Bryan Hyde, Avista Utilities; Ibrahim Shamia, Yair Berenstein, Michael Dolan, Commonwealth Associates

Keeping It Close: A Composite Solution to Rebuilding a 69kV Line, Hugh Voehl, Southern Maryland Electric Cooperative; John Williams, Booth & Associates; Ryan Schlotterbeck, Southern Maryland Electric Cooperative

Challenges in Analysis of 100-Year-Old River Crossing Structures, Pankaj Deshmukh, A S E C Inc.

Housatonic River Crossing Replacement: Transmission Line Deconstruction Gets Creative, Marc Phillips, John Rector, Black & Veatch

12:00 p.m.–1:30 p.m. | Lunch in Sebastian Ballroom Exhibit Hall

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1:30 p.m.–3:15 p.m. | Session 6: Substations | Panzacola Ballroom

Session Leads:

- **Leon Kempner, Jr., Ph.D., P.E., F.SEI, M.ASCE** and **Archie Pugh P.E., PMP, M.ASCE**

If lines are the arteries of our electrical grid, substations are its heart. And just like our own hearts, they must be able to keep running smoothly through stressful events to keep vital nutrients, or, “electricity” flowing. These authors highlight smart design and analysis that keep electricity flowing through stressful events such as electrical faults, earthquakes and vortex-induced vibration.

Practical Application of EPRI Research for Computing Fault Current Forces, Martin Hughes, EPRI; Matthew Bosworth, Center for Advanced Power Systems - Florida State University; Jose Blanco, DiGioia Gray and Associates.; Ian Hodgson, Lehigh University; Andrew Zorn, DiGioia Gray and Associates ; Dave Birrell, Windsor Bush Consulting

Damping Devices for Seismic Protection of Substation Equipment, Robert Cochran, Seattle City Light; Stefanie Gille, Eric Parker, San Diego Gas & Electric; Leon Kempner, Jr., BPA

Development of a Vortex-Induced Vibration Analysis Process and Evaluation of Fatigue Damage Risk, Hossein Qarib, American Electric Power; Ashkan Jeddi, Jieun Hur, Abdollah Shafieezadeh, The Ohio State University

Strain Bus Short Circuit Force Background, Accuracy, and Design Impacts, Alex Kladiwa, Burns & McDonnell

3:15 p.m.–4:00 p.m. | Refreshment Break in Sebastian Ballroom Exhibit Hall

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4:00 p.m.–5:20 p.m. | Session 7: Loadings | Panzacola Ballroom

Session Leads:

- **Vicki Schneider, P.E., M.ASCE**, and **Frank Agnew, P.E., M.ASCE**

Determining environmental loads is one of the few times that we take the weatherman seriously. What loads to apply to reach the desired reliability, without over designing, is one of the biggest challenges we face. Practical application of extreme wind and avalanche loading for transmission lines along with flood, hurricane, tsunami and tornado loading for substations are presented.

Wind Loading Considerations in Transmission Line Design, Thomas Mara, CPP Wind Engineering Consultants; Leon Kempner, Jr., BPA

Designing Overhead Transmission Lines to Withstand Snow Avalanches, Ming Lu, Dipayan Chakrabarti, BC Hydro

Is My Substation Ready for the Next Extreme Event?, Paul Somboonyanon, Caleb Jergensen, Connor Bowen, Burns & McDonnell

5:30 p.m.–7:00 p.m. | Networking Reception in Sebastian Ballroom Exhibit Hall

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INNOVATION DELIVERED

WEDNESDAY, OCTOBER 5

7:00 a.m –1:30 p.m. | Registration | Panzacola Foyer

7:30 a.m.–8:00 a.m. | Breakfast | Panzacola Foyer

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8:10 a.m.–9:30 a.m. | Session 8: Foundations | Panzacola Ballroom

Session Leads:

- **David Todd, P.E., F.SEI, M.ASCE** and **Vicki Schneider, P.E., M.ASCE**

Foundation uncertainty has kept many excellent engineers awake at night. We worry about what we’ll really find when the digging starts. Have we designed foundations with enough capacity to address below grade uncertainties, without breaking the project bank? And as icing on our uncertainty cake, have we minimized our foundation footprint, and associated impacts, to sensitive environmental areas? Identifying and managing these risks through smart engineering is the focus of this session.

Alternate Foundation and Structure Designs Mississippi Backwater Construction Challenges, Simon Murley, POWER Engineers, Inc; Christopher Strom, Xcel Energy; Jason Herron, Chance Civil & Utility Helical Products

Full Scale Direct Embed Steel Pole Load Testing, George Nugent, Ameren Transmission

Key Considerations for Managing Risk When Implementing Vibratory Caissons, Darren Campbell, David Hancock, Justin Lightner, Nate Schrein, Bradley Gardner, Choo Keong Ong, Burns & McDonnell

9:30 a.m.–10:15 a.m. | Refreshment Break in Sebastian Ballroom Exhibit Hall

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10:15 a.m.–12:00 p.m. | Session 9: Design/Analysis 2 | Panzacola Ballroom

Session Leads:

- **Otto Lynch, P.E., F.SEI, F.ASCE, and Ron Carrington, P.E., M.ASCE**

Designing and selecting efficient, creative transmission line structures is difficult. And more efficient designs often lead down a path of lighter structures, including guyed versions, slender members, evaluation of special load cases and sophisticated analysis techniques. This session will simplify the difficult by providing guidance on structure comparisons and selection, considerations for slender members and a method to evaluate seismic forces in latticed towers.

Overhead Transmission Line Structure Selection, Todd McMillan, Aaron Darby, American Electric Power

Cost and Performance of Guyed Lattice Structures vs. Self-Supporting Towers, Darel Tracy, Jared Smith, POWER Engineers, Inc.

Not so Good Vibrations – Design Considerations for Slenderness Limits, Richard Slocum, Daniel Beard, Meyer Utility Structures LLC

Seismic Analysis of Transmission Towers – Case Study, Mohamed Khedr, Rozlyn Lord, BC Hydro

12:00 p.m.–1:30 p.m. | Lunch in Sebastian Ballroom Exhibit Hall

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1:45 p.m.–5:00 p.m. | Exhibitor Move-Out

1:30 p.m.–2:50 p.m. | Session 10: Special Design Considerations Panzacola Ballroom

Session Leads:

- **Frank Agnew, P.E., M.ASCE and Wes Oliphant, P.E., F.SEI, F.ASCE**

It has been said that transmission lines, stretched across the landscape, create a perfect net for capturing problems. These ‘problems’ are ones that only a transmission engineer could love. Join this session to hear how problem-solving engineers are addressing an increased frequency and severity of flooding, helicopter construction techniques to access remote terrain, and cathodic protection (always a mystery) of embedded components.

Transmission Structures Exposed to Water Flow: Resiliency and Risk Mitigation, Eric Brezinka, Eric Altermatt, Black & Veatch; Deborah Nykanen, Kimberly Musser, Minnesota State University, Mankato

Cathodic Protection Solutions for Electric Utility Structures, Kevin Niles, Osmose Utilities Services, Inc.

Engineering Considerations for Helicopter Construction Methods Learned on Cricket Valley 345kV Project, Ryan Townsend, Dagda Corp; Robert Shuman, Con Edison; Joseph Moser, Greg Prem, Realtime Utility Engineers; Sydney McNeal, Crux Subsurface

2:50 p.m.–3:35 p.m. | Refreshment Break | Panzacola Foyer

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3:35 p.m.–5:00 p.m. | Session 11: SEI/ASCE Overhead Line Loading Standard | Panzacola Ballroom

Session Leads:

- **Otto Lynch, P.E., F.SEI F.ASCE and Joel Bryant, P.E., M.ASCE**

In consideration of the increasing national focus on reliability and resiliency of electrical overhead lines (OHL), the American Society of Civil Engineers (ASCE) and its Structural Engineering Institute (SEI) has recently approved the development of a national consensus engineering standard governing minimum design loads. The new OHL Loading Standard will consider current industry practice (Manual of Practice No. 74, NESC, and utility standards) and relevant resources such as ASCE 7-22, IEC 60826, RUS Bulletins 1724E-200 and 1724E-152, etc. The standard will address OHL load hazard levels, application criteria, and intended performance goals utilized for the design of structures supporting electrical overhead lines (transmission and distribution structures) and OHL joint-use structures carrying wired telecommunications infrastructure. An OHL loading draft pre-standard is available in the ASCE Manual of Practice 74, 4th Ed. Appendix M. This session highlights and summarizes the goals of the ASCE/SEI Overhead Line Loading Standard.

ASCE/SEI Overhead Line Loading Standard, Special ETS 2022 Session, Leon Kempner Jr., Bonneville Power Administration, Jerry Wong, DHW Engineering, Wes Oliphant, Exo, Otto Lynch, Power Line Systems, Frank Agnew, DRG: Technical Solutions, Michael Miller, Exo.

5:00 p.m.–5:20 p.m. | Conference Closing

Session Lead

- **Tim Cashman, P.E., M.ASCE**

POSTER SESSIONS

All Posters are in the Sebastian Ballroom Foyer, Monday–Wednesday.

- **Response Spectrum for Short Circuit Loads on Rigid Bus,** Josh Baker, Dashiell
- **Seismic Risk Assessment of the Electrical Substations in Colombia of ISA, the Largest Energy Transmission Company of Latin America,** Susana Galeano-Báez, Interconexión Eléctrica S.A.; Ana Beatriz Acevedo, Universidad EAFIT
- **Prediction of Modal Response of Towers Using Artificial Neural Networks,** O. Burak Yucel, Berkan Demir, H. Ibrahim Ates, Mitas Industry Inc., Alper Aldemir, Hacettepe University
- **Hurricane Fragility Analysis of Electrical Transmission Towers,** Xinlong Du, Jerome Hajjar, Northeastern University
- **Properties and Performance of Ductile Iron Poles,** Yair Berenstein, Commonwealth Associates Inc.; Warren Stewart, McWane Poles; Michael Dolan, Commonwealth Associates, Inc.
- **Influence of Steel Pole and Davit Arm's Deflection on Clearance to Structure Calculations,** Gautam Krothapalli, Josh Sebolt, Meagan Moeller, Michael Kruse, Burns & McDonnell
- **Considerations in Guyed Engineered Steel Structure Design,** Alexandra Lee, Jacob Clouse, Gautam Krothapalli, Jondy Britton, Burns & McDonnell
- **Optimization of Transmission Line Structures using Braced Post Insulators,** Kishor Kumar, Jeff Fraser, Dimitri Georgopoulos, AltaLink
- **Adaptive Foundation Design of Power Lines Reduces Schedule and Coordination Challenges of Field Geotechnical Investigations,** Steven Wiesner, Ashraf Jahangir, Kleinfelder
- **Short-Circuit Forces, Load Factors, & Ultimate Strength: Clearing Up Confusion,** Dylan Madden, Travis Layton, James Mosher, Burns & McDonnell
- **A New Approach to Substation Structure Foundation Design,** Daniel Beard, Jeff Wilkinson, Guy Faries, Meyer Utility Structures
- **Experimental Study on the Effect of Gusset Plates' Geometry on the Behavior of Steel Lattice Transmission Line Tower Connections,** Adam Mahamat Ali Ahmat, Sébastien Langlois, Kahina Sad Saoud, Pierre Labossière, Université de Sherbrooke
- **Aesthetics in Powerlines: Why It Matters,** Kenneth Sharpless, Exo, Alexander Richards, Aquawolf Consulting Engineers





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GOLF SCRAMBLE

Thursday, October 6

(Pre-registration required)

We are excited to host players at the Shingle Creek Golf Club for an 18-hole Golf Scramble event which promises to be a fun way to close out the conference.

Be sure to arrive at the course by 7:00 a.m. to check in and enjoy a light breakfast before the event. We will have a shotgun start at 8:00am which allows everyone to start at the same time on a different hole and for every team to finish around 12:00 p.m. The scramble format creates a fun environment for players of all skill levels. Participants will be grouped in 4-person teams and each player on the team hits a tee shot to start the hole. Each foursome should assign a team captain who helps decide which is the best shot to use of the four and all players move to that ball and hit again from that spot. The process is repeated for each shot all the way to the green and until the ball is holed out.

Participants will have the opportunity to win prizes including the lowest scoring team, highest scoring team, closest to the pin contests, and random drawings at the conclusion of the event.

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From the global leader in software development for the design of overhead electric power transmission, distribution, and communication lines and structures, comes PLS-GRID®. PLS-GRID leverages your decades of overhead line models built in PLS-CADD, PLS-CADD/Lite, PLS-POLE, and TOWER to create your own PLS-GRID that allows access to accurate structure usage, line clearances, vegetation clearances, thermal line ratings, plan and profile sheets, sag tension reports, staking data, construction documents etc. on your desktop as well as on the web.

What Does PLS-GRID Do?

PLS-GRID indexes all of your PLS-CADD, PLS-POLE, and TOWER projects, reports and associated data for easy distribution to all departments and contractors including non-PLS-CADD users.

PLS-GRID presents projects on a map both in PLS-CADD and in a stand-alone mobile web application for use on tablets, phones, etc.

PLS-GRID Project Manager provides easy check-in and check-out capabilities enabling auditing, revision tracking, standards enforcement, data deduplication and more.

How Does PLS-GRID Do All This?

PLS-GRID Server

- 100% built on Web Services to enable fast, simple, and reliable integration with your systems
- Keeps your data under your control on your servers in your datacenter “where it belongs”

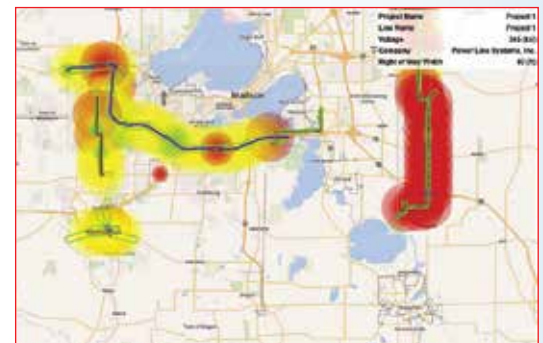
PLS-GRID Desktop

- Powers Grid Analytics for seamless one step grid wide reporting
- Provides “Grid View” graphical access to your models

PLS-GRID Web

- Shows projects on a map, with details about each structure and circuit directly inside a web browser with cross platform multiple device support
- Furnishes PLS-CADD reports as well as platform independent 3D visualization of your infrastructure

An Engineering-based Digital Twin



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Learn more at: powerlinesystems.com/pls-grid
or contact us for a product demo.

Power Line Systems is now a part of Bentley Systems. Learn more at Bentley.com

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GENERAL INFORMATION

Official Conference Hotel:

Rosen Shingle Creek

9939 Universal Blvd., Orlando, FL 32819

Phone: 866-996-9939

Central Reservations Office: 1-800-204-7234

By registering for this conference, you have agreed to all policies and health and safety requirements posted on the conference websites.

- <https://www.etsconference.org/about/policies>
- <https://www.etsconference.org/about/health-safety>

Professional Development Hours (PDH's)

About 2 weeks after the conference registrants will receive an email with instructions on how to login to ASCE MyLearning and select the sessions you attended and generate your certificate.

Age

Attendees under age 18 are prohibited.

ADA Compliance

If you require special assistance at the conference, a written description of your requirements along with your registration form or emailed to registrations@asce.org would have to be received no later than August 16, 2022. While ASCE/SEI will make every effort to meet your needs, accommodations cannot be guaranteed without notification by the deadline.

Meal Functions

Breakfast will be served daily, Monday – Wednesday from 7:30 – 8:00am in the Panzacola and Sebastian Foyers. Lunches will be served daily, Monday – Wednesday from 12:00 – 1:30pm in the Exhibit Hall. The Grand Opening Reception on Sunday and Networking Reception on Tuesday will be held in the Exhibit Hall from 5:30 – 7:00pm. The Networking Reception on Monday will be held on the Hotel Patio (weather permitting) from 5:30 – 7:00pm. We cannot guarantee food will be available thirty minutes after an event has begun. For all meal functions please arrive on time.

Medical Emergencies

Please refer to the ETS Conference Health & Safety page for COVID-19 protocols. In the event of a medical emergency, please proceed to the closest hospital listed below.

Orlando Health Dr. P. Phillips Hospital

9401 Turkey Lake Rd., Orlando, FL 32819

Phone: 407-351-8500

4.8 miles/13 mins. from the Rosen Shingle Creek

Photo & Video Recording of Sessions

ASCE will take photographs and/or make audio and visual recordings of the event. Participants grant to ASCE the absolute right and permission to use any such photographs or recordings that may be taken during the event for any purpose in its sole discretion.

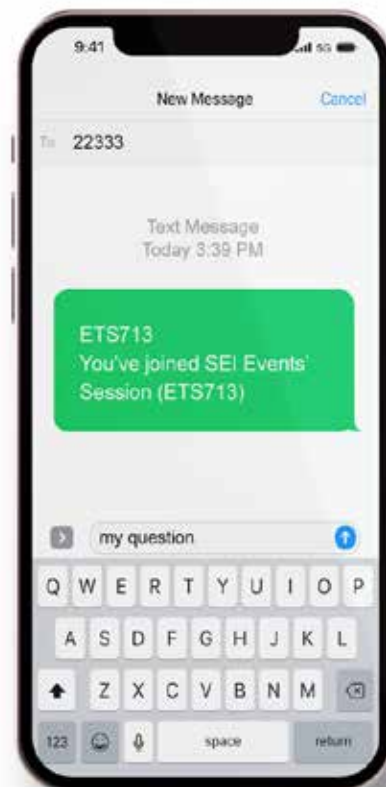
Photo, video, or audio recording(s) of any educational session is strictly prohibited without prior written permission from both ASCE and the session presenters(s).

Assumption of Risk

Please note that an inherent risk of exposure to COVID-19 exists anywhere other people are present. Any person who chooses to travel to and/or participate in this conference assumes all risks arising from that decision, including but not limited to infection from other vaccinated or unvaccinated participants, hotel guests, or other persons. All attendees must agree to comply with all safety procedures established by SEI as well as any other protocols put in place by the host sites, travel facilities, or any other applicable authorities.

How to Ask Questions During a Session

1. On your phone text to 22333
2. The message in the text is ETS713
3. After you receive the confirmation text from Poll Everywhere, text your question.





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2022 EXHIBITORS (as of September 6, 2022)

Company	Booth		
3M.	228	Induron Protective Coatings.	531
Almita Piling Contractors, Inc.	124	Intelli-Pole LLC	108
AMPIRICAL	230	Jennings Anodes USA, Inc.	121
Ampjack Industries Ltd.	216	Karamtara Engineering Pvt. Ltd	729
AP Sensing GmbH	619	Keeley Construction	620
Apar Industries Limited (India)	604	Keller	717
Arruti Group	621	Kiewit.	320
ASC, Inc.	505	Kleinfelder.	202
ASEC	616	Klute Inc.	721
ASCE Bookstore.	817	Laminated Wood Systems, Inc.	617
Bell Lumber & Pole Company.	222	Leidos.	503
BHI Energy	718	Lindapter.	520
Booth & Associates, LLC	107	M&S Engineering.	731
Bronder Technical Services	722	Magnum Piering	117
Brooks Manufacturing.	517	McWane Poles	523
Burns & McDonnell.	603	Mesa Associates Inc.	509
CHA Consulting, Inc.	103	Metalgalva North America	623
CHM Industries Inc.	304	METALPOL	116
Commonwealth Associates, Inc.	204	Meyer Utility Structures	516
Contech Engineered Solutions LLC	104	Michels Power, Inc.	823
Creative Composites Group	123	MITAŞ Industry Inc.	502
Crux Subsurface, Inc	409	Natina	220
Crystal Group	508	Nucor Towers and Structures	506
DFI Piling	219	NV5, Inc.	821
DiGioia Gray & Associates	209	OSMOSE Utilities Services	429
DISTRAN Packaged Substations.	406	Paul J. Ford & Company	723
DIS-TRAN Steel, Inc.	403	Pickett and Associates, LLC	703
Electrical Consultants, Inc.	223	Pileworks Inc.	118
ESI Industries	728	Pile Dynamics, Inc. and GRL Engineers, Inc.	622
Evolution Piling LTD.	421	Power Consulting Associates	629
Exo	417	Power Line Systems	229
Fabrimet Inc.	716	Power of Design Group	316
FDH Infrastructure Services LLC	519	Preformed Line Products	207
Forbes Bros. Group	708	Presto Geosystems	128
G-Tower	129	Public Utilities Maintenance/Powergrid Resources	206
GAI Consultants, Inc.	323	PUPI Crossarms	707
Great Southwestern Construction, Inc.	307	Rohn Products	217
Hans Steel Canada Corp.	105	RS Poles	203
Hanson	709	Sabre Industries, Inc.	329
HDR	522	SAE Inc.	606
Hubbell Utility Solutions (HUS)	317	SAE Towers	322
Hughes Brothers, Inc.	416	SANPEC INC	706
		SA-RA Group.	609

2022 EXHIBITORS (as of September 6, 2022)

Sargent & Lundy	306	TS Conductors	704
Schnabel Engineering, LLC	504	Ulteig	418
Sediver USA	402	Underground Devices, Inc.	218
Skipper Limited	131	US Helical Piles	607
Southwire Company LLC	529	Utility Pole Solutions, Inc.	309
Spiradrill	719	V&S Schuler Engineering, Inc.	120
Stantec Consulting	114	VAF Industries, L.L.C.	521
Stella-Jones Corporation	628	Valmont Utility	303
StressCrete Group	109	Wagners CFT	630
Structural Technologies	507	Watson Drill Rigs	126
TAPP, Inc.	602	WE Gundy + Associates Inc	119
TenCate Geosynthetics	720	West Power Energy	318
Threaded Fasteners Inc.	302	Westwood Professional Services	608
TorcSill Foundations, Inc.	407	Williams Form Engineering Corp.	702
Tower Drafting Services, Inc.	321	Wurth Construction Services	420
TransDesign International LLC	705	YAK ACCESS	730
TRC	408	Zhejiang Shengda Steel Tower	423

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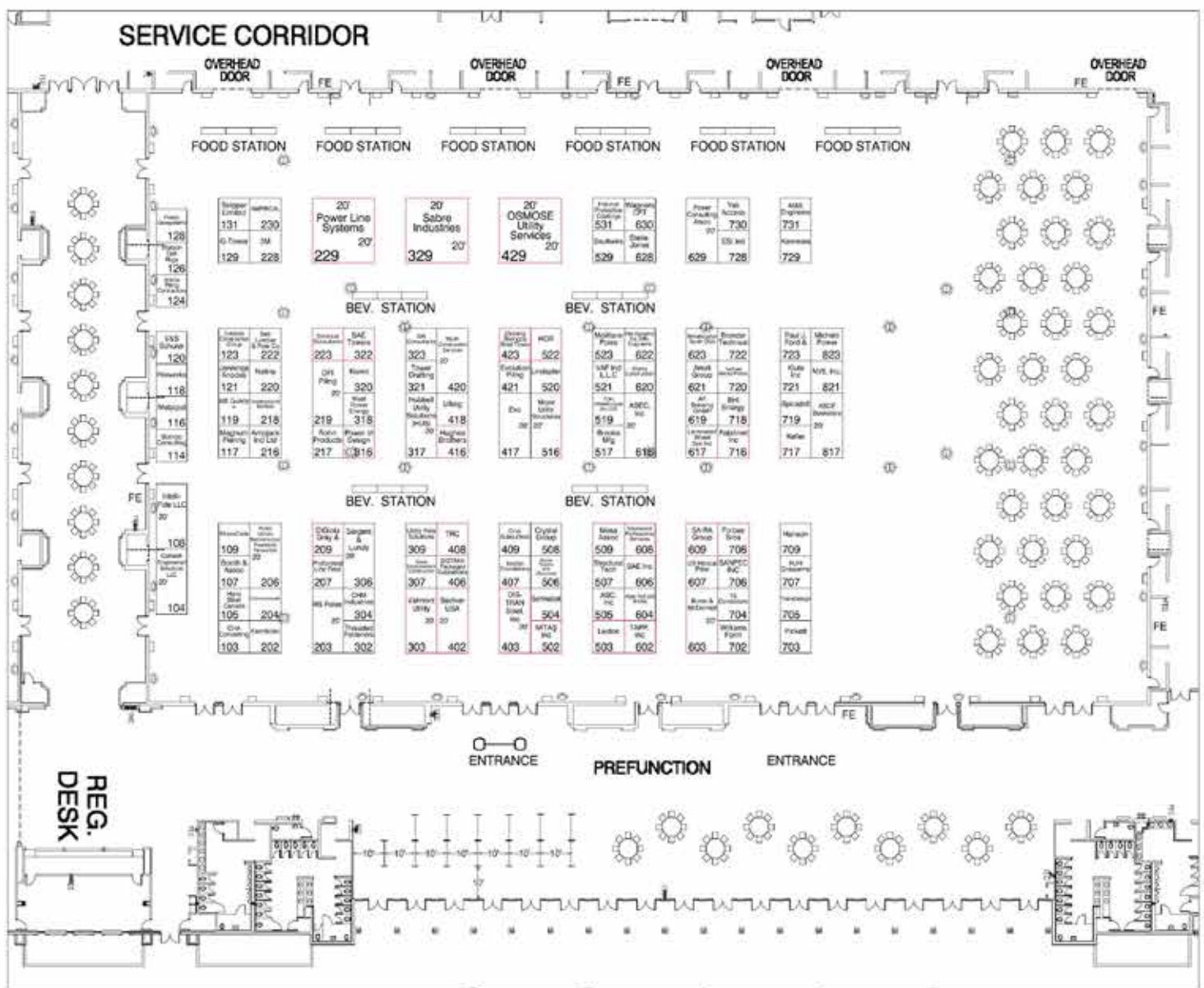
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EXHIBIT HALL MAP

Rosen Shingle Creek – Sebastian Ballroom Orlando, Florida

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Thermal Integrity Profiling

- Accelerates construction schedule as tests are conducted during concrete curing
- Evaluates concrete quality inside and outside the reinforcing cage



Crosshole Sonic Logging

- Evaluates concrete quality and identifies location of potential shaft anomalies
- Testing window typically 3-7 days or more after concrete placement



Low Strain Integrity Testing

- Assesses integrity of concrete structures revealing location of major defects
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- TAG and TAP-Edge units provide real time data collection via the Cloud, saving time and money

Cross Hole Analyzer (CHAMP-Q)

- Evaluates concrete quality and consistency by the crosshole sonic logging (CSL) method pulling 4 probes (6 profiles) at once
- PDI-TOMO, 3-D tomographic software optional for superior data analysis of complex or questionable areas

Pile Integrity Tester (PIT)

- Available in three versions: velocity only, force and velocity, or two velocity channels
- Performs tests quickly, making it possible to test every pile on a jobsite

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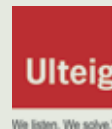
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