

# ICC Newsletter

**Act now! Special offer to first-time utility attendees to the ICC Spring meeting – ten complimentary registrations! Please contact [billtaylor@pesicc.org](mailto:billtaylor@pesicc.org).**

## From the ICC Chair



*Bert Spear*

As I begin my term as ICC Chair, I am deeply honored to have the privilege of being part of an engineering organization that dates to 1947. The first ICC meeting was held in New York City under

the auspices of what was then the American Institute of Electrical Engineers (AIEE), which later became the Institute of Electrical and Electronic Engineers when the AIEE merged with IRE (Institute of Radio Engineers) on January 1, 1963.

From the minutes of the first meeting, the name was changed from the “Insulated Power Cable Committee” to the present “Insulated Conductors Committee.” At the first meeting, our ICC predecessors formed twelve subcommittees, proposed research projects, and presented technical papers thus establishing the tradition of an active technical organization with full meeting agendas which continues today – 77 years and 150 meetings later.

My introduction to the ICC began at the 109th Spring 2001 meeting in Dearborn, Michigan. My recollection is that by around my third meeting, I was put to work with presentation pre-loading, later delegated to purchase the first ICC projector, and then followed by serving as a Working Group Vice-Chair and Subcommittee D Vice-Chair and Chair to where I am at today. When you are asked to volunteer in the ICC, you never know what it will lead to!

Along the way, there have been many ICC colleagues who have been most helpful in mentoring me – not only on technical matters but on the many ins and outs of navigating the balloting process, leading Working Groups and Subcommittees, etc. I would be very remiss if I did not recognize one person in particular – Kent Brown. Kent from the beginning encouraged me (albeit sometimes with mild arm twisting) to be active in the ICC and to be willing to assume leadership positions. Kent provided his usual wise counsel when I was offered the opportunity to be considered for ICC Vice-Chair/Treasurer elect. Thank you, Kent.

I thank outgoing Chair Yingli Wen and past-Chair Henk Geene for their outstanding service to the ICC. Yingli had the challenging task of resuming ICC meetings after a two-year hiatus due to COVID-19. Under Yingli’s leadership, we had a successful first post-COVID meeting and with subsequent meetings, the ICC has regained its pre-COVID attendance and activity levels. During COVID, Henk had the unique and unenviable task of canceling and rescheduling ICC meetings in such a manner as to keep the ICC financially solvent.

I am also very pleased to have Mike Mueller serving as Vice-Chair. Mike will bring strong leadership and organizational experience that, combined with the commitment and dedication of the Administrative Committee, will continue to carry the ICC forward.

I look forward to seeing everyone at the Spring 2024 meeting in sunny Palm Springs, California. Be sure to bring your sunscreen, shorts, golf clubs and swimming attire.

*Bert*

*Albert H. Spear III, Duke Energy*

## Practical Engineering – Project Case Reviews by Several US T&D Utilities ICC Spring 2024 Education Session

During the upcoming Spring 2024 Education Session, we will continue presenting technical challenges faced by several US utilities. Each US utility will present project case reviews covering design, installation, failure repair, and analysis of their T&D cable system. They will share their approach to new challenges, accommodation of renewable projects, and the rapidly changing power industry. The session will be interesting for cable system suppliers, contractors, designers, and consultants, and should lead to a better understanding of customer needs. Experienced engineers from these US utilities will share their knowledge and experience gained by solving problems during cable installation and failure repair projects. A Q&A session with our panelists will conclude the session.

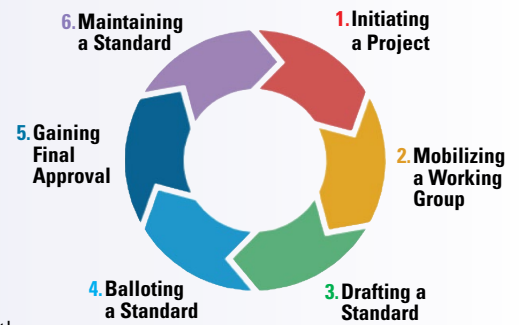
*Join us for an enlightening afternoon at the*  
**Westin Rancho Mirage Hotel in Palm Springs, California on Wednesday, May 15, 2024, 1:00-5:00 pm.**

## Standards Corner By Kathryn Klement, ICC Standards Coordinator

At IEEE, the development of new standards and the revision of existing standards always begins with a Project Authorization Request (PAR). New PARs are first approved by ICC's Administrative Committee (AdCom) and then sent to IEEE Standards Association New Standards Committee (NesCom) for approval. They are valid for up to 4 years before an extension is needed. ICC currently has 28 approved PARs.

You can learn more about the lifecycle of a standards project as an IEEE SA member through your My Project account. Keep an eye out for the Breakfast Training sessions at upcoming ICC meetings for a refresher on standards development policies and procedures at ICC.

Thank you to all the active working group members for your continued time and dedication to standards development. To get involved in any ongoing standards projects, you can attend the working group meetings at the next ICC or reach out to the Subcommittee chair for more information.



## Meet your new Program Coordinator!

Dalisa Gonzalez, a native of Perth Amboy, New Jersey, graduated from Kean University with a bachelor's degree in Psychology. She previously worked as the Coordinator of Advocacy Services at Women Aware, providing crucial legal services to victims of domestic violence. Currently, Dalisa serves as the Program Coordinator for IEEE SA, specializing in Program Management and Standards Development within the Institute of Electrical and Electronics Engineers.

With a passion for advocating for those in need and fostering innovation, Dalisa diligently works to facilitate significant initiatives in Program Management and Standards Development. Drawing on her education and experience, Dalisa brings a unique perspective to her role, ensuring that initiatives are executed with precision and efficiency.

She looks forward to working closely with the Insulated Conductors groups to contribute to their success. Committed to excellence and continuous improvement, Dalisa strives to make a positive impact in her community and beyond through her work at IEEE SA. Let's all be sure to welcome her to the Power and Energy Insulated Conductors world!

Dalisa's contact information is as follows:  
Email: [d.gonzalez@ieee.org](mailto:d.gonzalez@ieee.org)  
Phone: 732-465-6480

## Insulated Conductors Committee (ICC) Awards

*By Lauri Hiivala, ICC Awards Chair*

The strength of ICC is based on the wide range of expertise and collective technical knowledge of the many volunteer members. An important element of the ICC is recognition of contributions.

### ICC Certificates of Appreciation

At each ICC meeting, Certificates of Appreciation are presented for the best presentation at a Subcommittee, Working Group, Discussion Group or Educational Program meeting, such as the following:

Recipient	Citation
<b>Jim Guo</b>	for Best Presentation at the Spring 2023 Subcommittee A Meeting, <i>Gas Discharges in Cavities</i>
<b>Nigel Hampton</b>	for Best Presentation at the Spring 2023 Subcommittee A Meeting <i>Gas Discharges in Cavities</i>
<b>Mohamadreza ArabBaferani</b>	for Best Presentation at the Spring 2023 Subcommittee A Meeting <i>Gas Discharges in Cavities</i>
<b>Alejandro Escobin</b>	for Best Presentation at the Spring 2023 Subcommittee B Meeting <i>Universal HV Cable Repair Kit</i>
<b>Mark Stemmler</b>	for Best Presentation at the Spring 2023 Subcommittee C Meeting <i>SuedLink – The world's longest 525kV HVDC land cable system</i>
<b>Bert Spear</b>	for Best Presentation at the Fall 2022 Subcommittee D Meeting <i>Medium Voltage Cable Replacement at Oconee Nuclear Station</i>
<b>David Rouison</b>	for Best Presentation at the Spring 2023 Subcommittee D Meeting <i>Electrical Test Protocol for Improved Field Assessment of LV Cables in Nuclear Plants</i>
<b>Sarajit Banerjee</b>	for Best Presentation at the Spring 2023 Subcommittee D Meeting <i>Electrical Test Protocol for Improved Field Assessment of LV Cables in Nuclear Plants</i>
<b>Andrew Mantey</b>	for Best Presentation at the Spring 2023 Subcommittee D Meeting <i>Electrical Test Protocol for Improved Field Assessment of LV Cables in Nuclear Plants</i>
<b>Mark Fenger</b>	for Best Presentation at the Spring 2023 Subcommittee F Meeting <i>20 Years of Experience with Electrical Testing of HV &amp; EHV Cable Systems</i>
<b>Marc Dodeman</b>	for Best Presentation at the Spring 2023 Educational Program <i>Submarine Power Cable Systems – Design, Planning, Implementation and Repair</i>

### IEEE PES Technical Committee Certificates of Appreciation

Certificates of Appreciation are also presented to all outgoing Subcommittee, Working Group and Discussion Group Chairs and Vice Chairs, or upon publication of their IEEE standard or guide, such as the following:

Recipient	Citation
<b>Gabe Taylor</b>	for Services Rendered as Chair, Subcommittee D, <i>Generating Station and Industrial Cables</i> , Spring 2018 – Spring 2023
<b>Jeff Madden</b>	for Services Rendered as Chair, Working Group B02, <i>IEEE 404-2022 Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2.5 kV to 500 kV</i>
<b>Ivan Jovanovic</b>	for Services Rendered as Secretary, Working Group B02, <i>IEEE 404-2022 Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2.5 kV to 500 kV</i>
<b>Jim Guo</b>	for Services Rendered as Chair, Working Group A05, <i>IEEE 1235-2023 Guide for Properties of Stripes and Ridges for Identification of Underground Power Cable Jackets and Ducts</i>
<b>Lakshman Raut</b>	for Services Rendered as Secretary, Working Group A05, <i>IEEE 1235-2023 Guide for Properties of Stripes and Ridges for Identification of Underground Power Cable Jackets and Ducts</i>
<b>Martin von Herrmann</b>	for Services Rendered as Chair, Working Group F07, <i>IEEE 1617-2022 Guide for Assessment, Mitigation, and Control of Corrosion of Metallic Shields for Extruded Dielectric Cables Rated 5 kV to 46 kV</i>

# Offshore Wind Farm Cable Challenges By Allen MacPhail, Cabletricity Connections Ltd., IEEE Life Member

Transition from fossil fuel to renewable generation has led to a global explosion of offshore wind farm development. Rapidly increasing wind turbine generator numbers (WTGs), sizes, and offshore distances has created challenges to effectively provide inter-array submarine cables between the WTGs and to offshore collector stations. In addition, export cables from offshore collector stations to distant onshore grid interconnection points (POIs) are technically challenging, for the reasons described below.

But first, let's look at the general challenges facing wind farm developers, which influence the cable components necessary to tie it all together.

**Costs:** Building an extensive offshore wind farm with export cable transmission to onshore POIs is a massive undertaking, sometimes with unexpected costs making the project financially unfeasible.

**Regulatory Oversight:** Obtaining project permits and approvals can be a lengthy and complex process. Regulatory hurdles, environmental concerns, and legal disputes can delay or even derail the project.

**Market Dynamics:** Energy market volatility can impact the viability of these large-scale projects.

**Technical Limits:** An undersea transmission line involves intricate engineering and logistical challenges. Technical difficulties, such as cable manufacturing, installation, maintenance, and reliability issues, could contribute to project abandonment.

**Political and Public Opposition:** Strong opposition from local communities, environmental groups, or other stakeholders, can lead to project cancellation.

**Financial Viability:** Investors and financiers may withdraw their support if they perceive too high a risk or insufficient returns when assessing the project long-term profitability.

Compounding the above high-level challenges, the following are specific technical challenges for the installation and application of subsea inter-array and subsea/land export cables.

## 1 Cable Supply

Due to unequaled global demand, most of the world's cable factories are currently operating at full capacity. New factories and expansions are underway, but delivery times for some cable types could still exceed 5 to 10 years. Limited supply suggests less competition and higher costs. Major competing projects, such as the ambitious Morocco-UK project (Figure 1), could significantly increase competition for power cables and polymer compounds. It is therefore an important challenge for Owners/Developers to streamline the procurement process by performing critical front-end engineering and design activities, and to engage potential suppliers early in the project cycle. Early preparations of comprehensive RFP/tender packages, with reasonable approaches to risk sharing, is also important.



Figure 1: Possible route for 4 x 3800 km HVDC submarine cables from Morocco to UK (credit: www.xlinks.co/morocco-uk-power-project)

## 2 Cable Installation



Figure 2: Cable burial plough for simultaneous laying and burial

Record high demand for wind farm submarine cables is also competing with installation equipment for non-wind farm applications, like long-distance AC and DC cable interconnections between countries. Availability of cable laying vessels and burial equipment may need to be reserved for up to 5 or 10 years in advance. (Figure 2) This can be exacerbated in some jurisdictions by legislation discouraging the use of foreign flagged vessels between domestic ports.

## 3 Export cables to onshore points of interconnection (POIs)

Submarine cable landfall locations depend upon many technical, environmental, stakeholder, and construction constraints. It may not be possible to accept offshore wind power at already congested shore locations, which could be far from load centers. POIs need to be determined by conducting power system studies and time-consuming consultations with local power utilities and ISOs/TSOs. This could result in selection of HVDC cable systems from offshore collector/converters to distant POIs.

To optimize future transmission systems, it is important to consider a regional approach to integrating renewables into the existing electrical system. For many reasons it is not ideal to interconnect offshore wind farm generation into onshore grids on a project-by-project basis. A challenge is to provide possibly more efficient collective export cable solutions using offshore energy hubs and multi-terminal HVDC converters. (Figure 3)

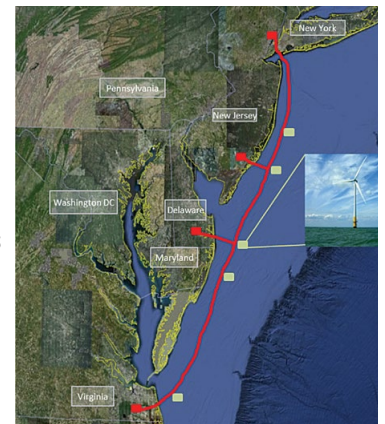


Figure 3: Atlantic Wind Connection concept

## 4 Reliability

High reliability stems from high quality and thorough collaborative QA/QC activities throughout the cable manufacturing and installation processes. According to insurers, 75% to 80% of offshore wind insurance claims are cable-related, but cabling accounts for only 8% (approximately 3% array, 5% export) of a wind farm's overall capital investment cost. 88% of cable claims are related to export cables, with repair times up to six months. Providing good cable laying and protection activities starts with detailed geophysical and geotechnical surveys of cable corridors, also necessary for optimal cable routings. The surveys and follow-up analyses provide a basis for Cable Burial Risk Assessments to establish optimum burial depths, and Burial Assessment Studies to assist with selecting burial tools to achieve those depths. Failure experience also indicates the importance of properly monitoring cables during their operational life using Distributed Acoustic Sensing (DAS), Distributed Temperature Sensing (DTS), and Automatic Information Systems (AIS) for real-time vessel tracking. (Figure 4) And it suggests the need for robust cable designs capable of withstanding unintended abuse during installation and a lifetime of service in often hostile marine environments.

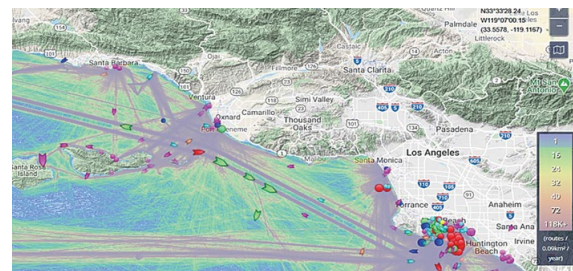


Figure 4: Example of historical AIS traffic density near Southern California (credit: Google and www.marinetraffic.com)

# International Events Calendar

Compiled by Harry Orton

Reminder: Please refer to the respective websites for up-to-date conference information. Be very careful when searching the Internet for conferences and symposia as there are fraudulent websites advertising predatory conferences with very similar names. Their sole purpose is to collect papers and registration fees.

## 2024

### FWire Dusseldorf

15-19 April, Dusseldorf, Germany  
<http://wire-tradefair.com>

### Hannover Fair

22-26 April, Hannover, GERMANY  
[www.hannovermesse.de/en/](http://www.hannovermesse.de/en/)

### IEEE Rural Electric Power Conference

23-25 April 2024, Tulsa, Oklahoma USA

### EIC (Electrical Insulation Conference)

2-6 June, Minneapolis, MN  
<https://iee-eic.org/>

### Wire Expo

11-12 June, Uncasville, CT  
<https://www.wirenet.org>

### IEEE PES General Meeting

21-24 June, Seattle WA.  
[rosanne.jones@ieee.org](mailto:rosanne.jones@ieee.org)

### ICD (International Conference on Dielectrics)

30 June-4 July, Toulouse, France.  
<https://iee-icd.org/>

### ICPADM (International Conference on the Properties and Applications of Dielectric Materials)

4-7 August, Phuket, Thailand.  
<https://ieeedeis.org>

### CIGRE 2024 General Session

25-30 August, Paris, France  
<https://www.cigre.org/>

### CMD 2024 (Condition Monitoring and Diagnosis)

20-25 October, Gangneung, Gangwon-do, Korea.  
[www.cmd2024.org](http://www.cmd2024.org)

## 2025

### CIGRE 2025

Trondheim, Norway, dates to be advised.  
<https://www.cigre.org/>

### Interwire 2025,

13-15 May, Atlanta, GA.

### CIRE 2025,

16-19 June, Geneva, Switzerland.  
<http://www.cired2025.org>

### CEIDP (Conference on Electrical Insulation and Dielectric Phenomena)

14-17 September, Manchester, UK.  
<https://ceidp.org/>

### Wire Southeast Asia

17-19 September, Bangkok, Thailand.  
[www.wire-southeastasia.com](http://www.wire-southeastasia.com)

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## 5 Environment

High on the list in the IEEE Code of Ethics is a requirement: "1. ...to hold paramount the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, to protect the privacy of others, and to disclose promptly factors that might endanger the public or the environment." Procuring, routing, and protecting offshore wind cables is essential to getting the power to POIs, and so is environmental stewardship. A key element of this is the Environmental Impact Assessment (EIA) process, in consultation with key regulatory bodies, also recognising that offshore wind generation remains an evolving industry.

### Key themes related to subsea cables are:

- Colocation and Coexistence (e.g., with other Sea Users / Commercial Fisheries)
- Electromagnetic Fields (EMF) and Heating Effects
- Fisheries Access
- Benthic Resources
- Habitats Regulations Assessment
- Navigational Risk
- Underwater Noise (especially during installation)

It is noteworthy that applying HVDC systems for power export can result in fewer cables, lower EMFs, faster installation, and lower environmental impact, especially if bundled cable installations are applied.

## 6 Dynamic Cables

Dynamic cables for floating WTGs, collector/converter stations, and their export cables bring their own sets of challenges to Offshore Wind. So, stay tuned for a future newsletter.

**In conclusion**, the entire power cable industry has been remarkably effective in addressing the challenges arising from evolving offshore wind farm applications. More challenges lie ahead, and it is expected that additional successes will follow.

## IN MEMORIAM

### ROBERT O WILKINSON

September 1925-June 2023

Bob Wilkinson, a decorated World War II veteran and 68-year contributor to the cable industry, passed away in June, just short of his 98th birthday, at his home in Latrobe, Pennsylvania. Bob joined the Army at age 17 and served in the European theater, receiving two purple hearts among other medals. After the war, he graduated from Georgia Tech's engineering program. He joined the Phelps Dodge Cable and Wire company in 1954 and served as a field engineer for 14 years. In 1970, he co-founded UTEC Constructors and was vice president there until leaving to work for Westinghouse, where he was in charge of installation for 500 kV pipe-type and 230-kV extruded-dielectric cable systems at EPRI's Waltz Mill Underground Transmission Test Facility. He was chair of the ICC Subcommittee 1, Structures, in the 1980's.

Bob semi-retired in 1990 but worked as a field observer until about 2015. He continued to consult from his home, and provided guidance and support, as well as a complete description of any construction project he worked on for his 60 years in the field. He was known as a tough, gruff, no-nonsense field engineer, but he was extraordinarily loyal to his friends, making a point to visit them throughout the country every time he had the chance. Few associates knew that he studied calculus and celestial navigation when he went back to his room in the evenings while traveling to oversee projects. Bob was really pleased to attend the Denver ICC meeting last April and visit with many engineers he had worked with over the years. "They don't make 'em like that anymore." We will miss Bob.



## Upcoming ICC Events

### 12-15 May 2024,

Westin Rancho Mirage, Palm Springs CA

### 20-23 October 2024,

Hyatt Regency Coconut Springs, Bonita Springs, FL

### 12-21 May 2025,

Omni Louisville, Louisville, KY

### 26-23 October 2025,

Omni Amelia Island Resort, FL

## Tell Us What You Think!

ICC welcomes your feedback. If you'd like to suggest topics for upcoming issues of the ICC Newsletter or add a colleague to our email database, please contact Rachel Mosier at [r.mosier@pdc-cables.com](mailto:r.mosier@pdc-cables.com).