Fall 2023, Volume 13, Issue 2

ICC Newsletter

Act now! Special offer to first-time utility attendees to the ICC Fall meeting – ten complimentary registrations! Please contact billtaylor@pesicc.org.

From the ICC Chair

Yingli Wen

It's hard to believe that almost two years have gone by since we resumed the in-person meetings following the COVID global pandemic. We had three very successful meetings in the past year and a half with higher-than-expected attendance. The Spring 2023 meeting in Denver, Colorado nearly broke the record with 517 registered attendees. The Fall 2018 meeting in Orlando/Disney World had the highest attendance of 526.

For the Fall 2023 ICC meeting, we are returning to New Orleans, Louisiana for the third time and after 41 years! The other two meetings were Spring 1982 and Spring 1970. If the chance to have an over-the-top experience offered by The Big Easy is still not enticing enough, we will be celebrating the 150th ICC meeting with exciting activities such as music, dancing, and photography. I invite all ICC members, returning guests, and new guests to join me and help celebrate this important milestone.

The conclusion of the 150th meeting will also mark the end of my term as Chair of the ICC. It has been an honor and pleasure serving you. I thank all of you for your continued support of the ICC, your contribution to IEEE/ICC standards development, and your passion in making the ICC a great community for cable engineers and enthusiasts. I would like to extend my appreciation to the outgoing Immediate Past Chair Henk Geene for his strong leadership during a very difficult time that was unprecedented in the history of ICC. We have an incredible Administrative Committee (AdCom) that is crucial to the success of the ICC. I am indebted to each and every AdCom member for your support and assistance.

Please join me in welcoming the incoming Chair Bert Spear and incoming Vice Chair Mike Mueller, who will lead the group for 2024 – 2025. Bert and Mike have been serving the ICC for decades in various leadership positions with increasing responsibilities. With their excellent technical expertise, extensive experience in the ICC's operations as well as support from the dedicated AdCom members, the ICC will be in good hands.

Be well and I look forward to seeing you in New Orleans.

Yingli Wen, Ph.D.
Consolidated Edison Company of New York

ICC Fall 2023 Education Program Session

Practical Engineering – US Utilities T&D Actual Project Reviews

The upcoming Fall 2023 Education Session will present actual project cases from several US utilities covering design, installation, failure repair, and analysis of various T&D cable systems. The session will be interesting for cable system suppliers, contractors, designers, and consultants, and will help to better understand customer needs. Experienced US utility engineers will share their knowledge and experience, solving various problems that occurred during actual cable installation projects and failure repairs. A Q&A session with our panelists will be included.

Join us for an enlightening afternoon at the
Hyatt Regency hotel, New Orleans on Wednesday, November 1, 2023, 1:00-5:00 pm.

ICC Newsletter Team Rachel Mosier, ICC Communications Chair • Harry Orton, Associate Editor

2023

Standards Corner

By Kathryn Klement, ICC Standards Coordinator

Since the Spring 2023 meeting, the IEEE SA Standards Board has approved one new ICC standard and two revised standards

- (NEW) IEEE 2412 *Standard Test for Determining Circuit Integrity Performance of Fire Resistive Cable Systems in Passenger Rail and Road Tunnels* – WG D21W chaired by James Conrad
- IEEE 400 *Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above* – WG F01W chaired by Nigel Hampton
- IEEE 634 *Standard for Cable-Penetration Fire Stop Qualification Test* – WG D08W chaired by Gabe Taylor

Congratulations to the working groups for reaching this milestone.

One new project was approved:

- P3174 *Guide for Dynamic Rating of Underground Cable Systems* - WG C36W chaired by Chris Grodzinski

To get involved in any ongoing standards projects, you can attend the working group meetings at the next ICC or reach out to the relevant Subcommittee Chair for more information.

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
Sverre Hvidsten	for Best Presentation at the Fall 2022 Subcommittee A Meeting *Time to Failure Testing of Submarine Cables in Saltwater at High Temperatures and Electrical Stress*
Liza Banhalmi Kramer	for Best Presentation at the Fall 2022 Subcommittee B Meeting *Primary Bushing Failures on Con Edison Network Transformers*
Tom Campbell	for Best Presentation at the Fall 2022 Subcommittee B Meeting *Primary Bushing Failures on Con Edison Network Transformers*
Clay Brelsford	for Best Presentation at the Fall 2022 Subcommittee C Meeting *Cathodic Protection Applications for Pipe-Type Cable Installations*
Craig Goodwin	for Best Presentation at the Fall 2022 Subcommittee F Meeting *A Multi-tool Approach to MV/HV Cable Testing in the Field*
Robert Hobson	for Best Presentation at the Fall 2022 Educational Program *Submarine Cable System for Offshore Wind Farms*

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
Tom Campbell	for Services Rendered as Chair, Subcommittee B, Accessories, Spring 2019 - Fall 2022
Jody Levine	for Services Rendered as Chair, Working Group F04; IEEE 400.3-2023 Guide for Partial Discharge Field Diagnostic Testing of Shielded Power Cable Systems
Joshua Perkel	for Services Rendered as Secretary, Working Group F04; IEEE 400.3-2023 Guide for Partial Discharge Field Diagnostic Testing of Shielded Power Cable Systems

2023 Technical Committee Distinguished Service Award

This award is to acknowledge outstanding service to the committee over many years, and was presented as follows:

Earle C. (Rusty) Bascom, III received the 2023 Technical Committee Distinguished Service Award with the following citation: For his exceptional assistance and support to the ICC Executive Committee as Past Chair during the extraordinary circumstances of the COVID-19 pandemic.

The Cable Engineering Committee (CEC) of the Association of Edison Illuminating Companies (AEIC) have recently issued revisions to the following specifications and guides:

CS2-23 Specification for Impregnated Paper and Laminated Paper/Polypropylene/Paper Insulated High Pressure Pipe Type Cable.

CG3-21 Guide for Installation of Pipe Type Cable Systems.

CG13-21 Guide for Testing Moisture Impervious Barriers Made of Laminated Foil Bonded to the Jacket of XLPE Transmission Cables.

Revisions to the following are nearly complete, with availability expected later this year:

CS9 Specification for Extruded Insulation Power Cables and Their Accessories Rated Above 46kV through 345 kVac.

CG4 Guide for Installation of Extruded Dielectric Insulated Power Cable Systems Rated 69 kV Through 138 kV.

CG7 Guide for Replacement and Life Extension of Extruded Dielectric 5 – 45 kV Underground Distribution Cable Systems.

The CEC is actively updating/developing the following specifications and guides:

CS8 Specification for Extruded Dielectric, Shielded Power Cables Rated 5 through 46 kV.

CS31 Specification for Electrically Insulating Pipe Filling Liquids for High-Pressure Pipe-Type Cable.

CG10 Guide for Developing Specifications for Extruded Power Cables Rated 5 through 46 kV.

CG11 Guide for Reduced Diameter Extruded Dielectric Shielded Power Cables Rated 5 Through 46 kV.

NEW Guide for Installation and Application of MV OH Covered Conductors.

NEW Guide for Post Production Sampling of Non-Conforming Cable.

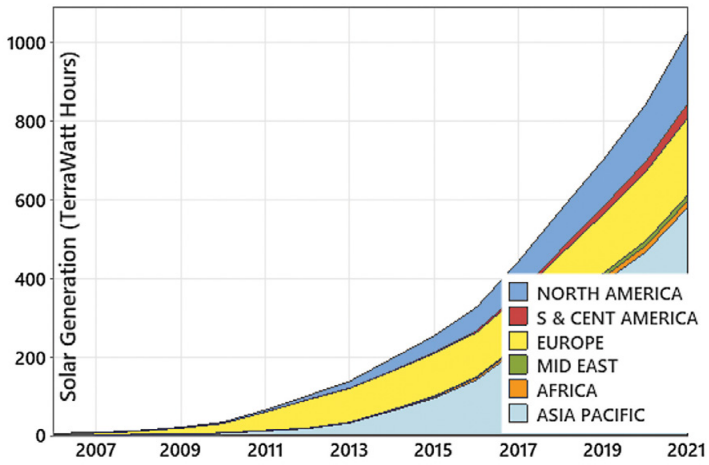
Any questions on or input to the development of CEC specifications or guides may be made by contacting AEIC at *https://aeic.org/contact-us/*.

Qualified utility engineers are always being sought to join the committee. Cable engineers from member companies interested in joining the CEC or any non-member utility interested in joining AEIC should reach out to AEIC at *https://aeic.org/contact-us/* . To find out if a company is a member of AEIC visit *https://aeic.org/member-companies/*.

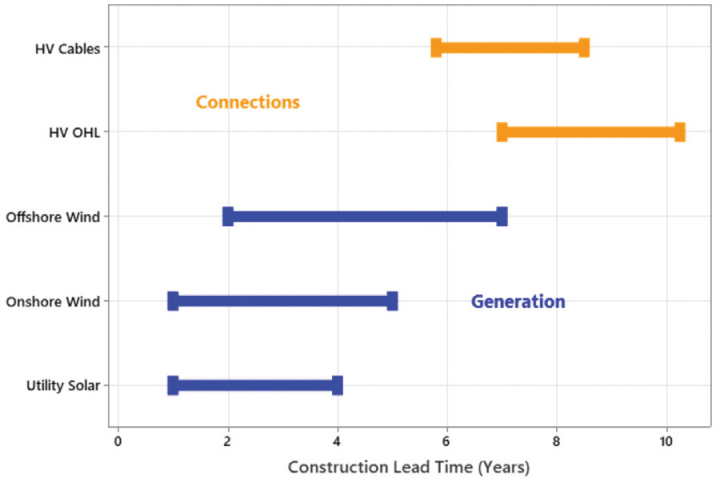
Evolving challenges of cables and connectors for Photovoltaics (PV) applications

By Ning Lu, Pierre Marie Doitrand, Susan Stene, Nigel Hampton: UL Solutions

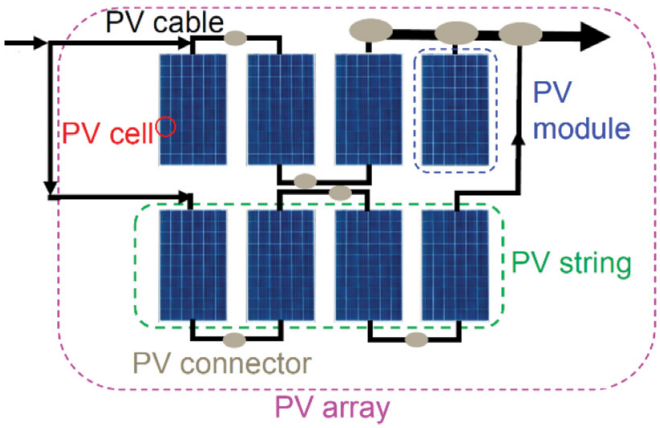
Renewable energy sources (biofuels, hydro, solar and wind) continue to expand their role in the electricity generation mix, contributing 27% globally, with solar providing 4% of the generation. Although, currently, one of the smaller renewable energy sources, solar or PV-based energy generation, has a long-term growth trend of approximately 50% per annum, with the Asia Pacific region having the largest installed capacity in 2021. One of the largest challenges with solar is the fluctuation in generation due to available sunlight. This leads to generation capacity factors of around 25% compared to natural gas and nuclear, which are in the 50%-90% range.



Even though there is a clear impetus for the installation of renewables, there are considerable lead times (years) both for the generation and the grid elements. In fact, solar is the technology that can be most rapidly implemented at one to four years. Additionally, the availability of the connections to the grid and the need for storage within the system add to the challenge of bringing these resources online.



Cables and connectors play an important role in solar projects in that they provide the infrastructure that both links and transmits the power from the modules to the strings and thence to the arrays. Large amounts of both cables and connectors are used in solar farms. This is not surprising when you consider that the footprint of a typical solar farm is approximately 2.5 km^2 per 100 MW. Even with the recently improved efficiency of design methods and new PV modules both decreasing the cable used per MW, the growing size of the farms means that a typical 100 MW farm will have around 700 km of cable and well over 100,000 connectors.



There are several exciting challenges for PV cables and connectors, including:

Size of solar farms – Installations continue to grow, with the largest being >2 GW, increasing the need for more cables and connectors.

Connectors – Connector performance continues to improve, with further opportunities in the areas of interoperability, ease of installation and preparation tooling.

Building Integrated PV (BIPV) – PV designed as the outer surface of buildings, during the initial architectural design require cables with modified (possibly increased) flammability ratings.

Floating applications – In installations on bodies of water (lakes, seas, irrigation, dams, canals) to reduce land use, improve module efficiency and conserve water, the cables and connectors will likely require increased resistance to the impact of water (fresh, salt, and contaminated).

Longevity and quality – As the applications become more challenging and PV provides an increasing portion of the generation mix, the performance of the cables and connectors will need to keep up with the evolving needs of the end user.

There is little doubt that there will be plenty of activity at the ICC to look forward to for cables and connectors for PV applications.

Bibliography / Sources

1. "bp Statistical Review of World Energy - 2022" 71st ed.
2. "Energy Technology Perspectives 2023"; IEA
3. Energy.gov – "Generation Capacity Factors"

PV

International Events Calendar

Compiled by Harry Orton

Reminder: The continuing world situation has made it very difficult to provide accurate conference listings and dates as some conferences have gone virtual while others have changed dates, relocated or have been cancelled. Please refer to the respective website 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.

2023

Floating Offshore Wind
4-5 October, Aberdeen, Scotland
https://events.renewableuk.com

CEIDP (Conference on Electrical Insulation and Dielectric Phenomena)
15-19 October, East Rutherford, NJ
https://ceidp.org/

2024

Wire Dusseldorf,
15-19 April; Dusseldorf, Germany
http://wire-tradefair.com

Hannover Fair
22-26 April; Hannover, GERMANY
www.hannovermesse.de/en/

IEEE Rural Electric Power Conference
23-25 April; Tulsa, Oklahoma USA
https://ieeerepc.org/

EIC (Electrical Insulation Conference)
2-6 June; Minneapolis, MN
https://ieee-eic.org/

Wire Expo
11-12 June; Uncasville, CT
https://www.wirenet.org

ICD (International Conference on Dielectrics)
30 June-4 July; Toulouse, France
https://ieee-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

Calendar

Upcoming ICC Events

30 October-2 November 2023,
Hyatt Regency, New Orleans, LA

12-15 May 2024,
Western Rancho Mirage,
Palm Springs CA

20-23 October 2024,
Hyatt Regency Coconut Springs,
Bonita Springs, FL

ICEA Energy Cable Standards Updates

By Jared Weitzel, ICEA 1st VP Energy Division

The Insulated Cable Engineers Association (ICEA) is in its 98th year. We have resumed quarterly in-person meetings with a return to great attendance levels. The next meeting is scheduled for September 2023 in Asheville, NC including the annual awards banquet recognizing substantial contributions to ICEA and the industry. Our past members will rejoin the group as honorary members and continue to share their knowledge, guidance, and a few stories.

ICEA continues to grow its member base and is always open for additional technical staff from wire and cable manufacturers to join.

The following documents have recently been revised and published:

- ANSI/ICEA T-22-294 - Test Procedures for Extended Time-testing Of Wire and Cable Insulations for Service in Wet Locations
- ANSI/ICEA T-25-425 - Guide for Establishing Stability of Volume Resistivity for Conducting Polymeric Compounds of Power Cables
- ANSI/NEMA WC 54/ICEA T-26-465 - Guide for Frequency of Sampling Extruded Dielectric Power, Control, Instrumentation and Portable Cables for Test
- ANSI/ICEA P-45-482 - Short-Circuit Performance of Metallic Shields & Sheaths
- ANSI/ICEA S-97-682 – Standard for Utility Shielded Power Cables Rated 5 Through 46 kV
- ANSI/ICEA S-121-733 - Standard for Tree Wire and Messenger Supported Spacer Cable

The following documents are under review or in the balloting process:

- ANSI/NEMA WC 58/ICEA S-75-381 - Portable and Power Feeder Cables for Use in Mines and Similar Applications
- ANSI/ICEA S-70-547 - Weather Resistant Polyethylene Covered Conductors
- ANSI/ICEA S-113-684 - Performance Based Standard for Electric Utility Extruded Dielectric Shielded Power Cables Rated 5 Through 46 kV
- ANSI/NEMA WC 10100/ICEA S-129-755 - Standard for High-Temperature Instrumentation and Control Cables for the Transmission and Distribution of Low Voltage Electrical Energy

The following working groups are developing new standards:

- WG 726 – Pellet Inspection Systems
- WG 738 – VFD Cables <= 2 kV
- WG 750 – Wind Turbine Cables
- WG 751 – MV DC Cables
- WG TBD – Overhead Covered Conductors for Transformer Drop Wires and Equipment Leads

Additional ICEA information and its standards can be found at *www.ICEA.net*.

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.