

IEEE Power and Energy Society Entity Annual Report

2025

Entity: IEEE PES Transmission and Distribution Committee

Website: <https://cmte.ieee.org/pes-td/>

Chair: Julio Romero Aguero

Vice-Chair: Rob Schaerer

Secretary: Brian Johnson

Immediate Past Chair: Eriks Surmanis

1. Significant Accomplishments:

Capacitor Subcommittee:

P18 final DRAFT was approved by RevCom and should be published with 2025 year.

P824 final DRAFT was approved by RevCom and should be published with 2025 year.

Distribution Subcommittee:

New collaboration with PSIM and Sensors subcommittee for the use of sensors for AI applications NS Asset Management.

Webinars are being held with interested participants across all working groups in subcommittee more frequently than the annual JTCM and PESGM.

Subcommittee started two new task forces. One on asset management and the other on AI impact on distribution systems.

ESMOL Subcommittee:

P1048 final DRAFT was approved by ESMOL SC to go to ballot.

P1067, P2798, and P1882 were approved to go to ballot re-circulation

Conducted a 765kV Joint panel ESMOL/OHL SCs at IEEE JTCM on Monday 1/12/26. There were over 100 attendees. The panelists presented the challenges and needs in T&D standards to incorporate needs of upcoming 765 kV projects in the US. Design practices, work methods, and training were discussed. ESMOL members presented at ASTM F18 for the creation of a standard for conductive suits for the industry for live work (barehand, hotstick methods) and de-energized work (*ac* induction protection). ASTM F18 just released the standard, ASTM F3732, in late 2025, and they recognized the support of ESMOL members in the development of the standard.

HVDC and FACTS Subcommittee:



Power & Energy Society®

1. Four panels this year, namely:
 - a. Offshore Grid Planning (Ervin Dr. Spahic and Cornelis Plet) Tuesday July 29 8:00-9:50
 - b. Practical Challenges in Design, Integration, and Operation of MMC-based HVDC Transmission Systems (Sahar Pirooz Azad and Firouz Badrkhani Ajaei) Wednesday July 30 08.00-09.50
 - c. Digital Twin in HVDC from minutes to microseconds applications(Mikael Dahlgren) Tuesday 29 July 10:00 -11:50
 - d. HVDC Systems Supply Chain Issues and Ways Forward (Dirk Van Hertem) Thursday July 31 10.00-noon – full house
2. New or completed standards projects
 - a. Discussion on taking responsibility on WGI10 - High Voltage Direct Current from the FACTS & HVDC Stations Subcommittee
 - i. Specific standard projects on VSC HVDC functional specification
 - ii. See email to Robyn.
 - b. Ongoing discussions regarding the following projects:
 - i. “Guide for Test Method of Corona and Heat Cycle for Electric Connecting Fittings for HVDC Converter Station”
 - ii. New, PE/T&D/System Commissioning WG, “Guide for System Commissioning of Medium and Low (750 V to ±50 kV) Voltage Direct Current Distribution Network”
 - iii. P2981, New, PE/T&D/UHVDC CSF, “Guide for Converter Station Fittings of Ultra-high Voltage (above or equal to 800 kV) Direct Current Power Transmission Projects”
 - iv. EPM# P0165_Guide for Control and Protection system Integration Test of Distributed Power Flow Controller (DPFC)

Power quality subcommittee:

- 1) The IEEE PES Working Group on Digital Twin for Transmission and Distribution (T&D) Power Equipment, hereafter referred to as "WG," established 7 Task Forces, which are Standard Task Force, Digital Twin Software System Task Force, Overhead Line Digital Twin Task Force, Energy Storage Digital Twin Task Force, GIS/GIL Digital Twin Task Force, Distribution Digital Twin Task Force and Substation Equipment Digital Twin Task Force.
- 2) The WG held a WG meeting in April 2025 in Shanghai, China. It was announced at the meeting that each Task Force will focus on its own key and technical task and invite representative entities and experts as needed, so as to complete the establishment of the task forces and the implementation of annual key tasks to develop technology reports and White Paper 2.0 based on each Task Force research achievement.
- 3) The WG held the 2025 IEEE PES General Meeting Panel Session - Digital Twin for Power Equipment. Four experts presented reports on topics related to the status and outlook of digital twin technologies applications on power industry. The WG chair, Xuzhu Dong, attended the meeting and delivered an opening remarks.

Transmission subcommittee:

- o Led/sponsored 3 panels at the IEEE PES GM 2025 in Austin, TX
- o Energy Storage as Grid Assets: Controls, Challenges and Opportunities



Power & Energy Society®

- o Modeling and Control of Multiterminal High Voltage DC Grids for Improved Grid Strength for Interconnection of Converter-Interfaced-Generator dominated ac Systems
- o Open-Source Capabilities for EMT Simulations: Current Status, Needs, Future
- o Transmission Voltage Optimization WG published Technical Report: TR136 – Voltage Control and Reactive Power Optimization in Emerging Transmission Systems – October 2025
- o Initiated and launched the Data Center Interaction with Transmission System Task Force

Standards subcommittee:

Active PARs:

Date	Entity	Individual	Total
11/19/2024	12	41	53
4/15/2025	13	41	54
1/2/2026	14	46	60

Active Standards:

Date	Entity	Individual	Total
11/19/2024	24	54	78
4/15/2025	24	50	74
1/2/2026	29	54	83

The T&D Committee has 143 active PARs and standards, which is second only to the IEEE PES Transformers Committee, which has 164. #3 is IEEE 802 Standards Committee in the Computer Society (C/LAN), which has 121.

China Satellite Technical Committee-Transmission & Distribution (TDSTC)

1) TDSTC held the "2025 IEEE PES China Satellite Technical Committee - Transmission and Distribution (TDSTC) Annual Meeting" in April 2025 in Shanghai, China, with over 200 participants attracted.

2) TDSTC reported to the IEEE PES Localized Technical Activities Committee through bimonthly communication meetings. TDSTC brings up work items for the meeting agenda focus on the issues that need to be addressed, and promoting the resolution of matters requiring support in the course of the TDSTC’s work.

3) TDSTC updated information such as official activities, 2025 membership roster, 2025 annual report etc. through monthly STC meetings, and this information is displayed on the IEEE PES website.

- 4) TDSTC renewed the Detailed Rules for Working of IEEE PES China Satellite Technical Committee-Transmission & Distribution for more streamlined management procedures.
- 5) TDSTC developed the Standards Submission Guidelines of IEEE PES China Satellite Technical Committee-Transmission & Distribution, which elaborates on the specific requirements for IEEE standard application and provides step-by-step guidance and explanations for the application process.
- 6) TDSTC held the 2025 Secretariat Work Conference to drive the effective implementation of TDSTC and its Subcommittees' annual work plans in 2025, address issues encountered in their development and capacity building and further enhance the outcomes of their international cooperation.
- 7) TDSTC set up Task Forces for IEEE PES Working Group of Digital Twin for T&D Power Equipment. The key Task is to develop technology report based on each Task Force research achievement.
- 8) The chair, vice secretary and liaison of TDSTC attended the 2025 IEEE PES General Meeting, the chair held a Panel Session--Digital Twin for Power Equipment, over 40 experts attended. The chair and other 4 attendees gave their reports.
- 9) TDSTC has actively proposed standards development activities in the past year, with five new proposals approved by the T&D Committee, two undergoing the IEEE SA ballot, one standard has been published and five under development.
 - New PARs approved
 - P3778 Guide for digital modeling based on Light Detection and Ranging (LiDAR) data for overhead transmission lines
 - P3780 Guide for the Application of Backup Safety Clamps on Overhead Transmission Lines
 - P3587 Standard for Wear Resistance Fittings of Overhead Lines - Part 1: Definition and General Requirements
 - P3588 Standard for Wear Resistance Fittings of Overhead Lines - Part 2: Test Methods
 - P3590 Guide for Technical Parameters and Acceptance Methods of Double Rocker Jib Gin Poles on Ground for Transmission Tower Erection
 - **IEEE SA ballot process**
 - P3336 Guide for vibration tests for aircraft warning marker balls on overhead transmission lines
 - P3413 Guide for Technical Requirements and Acceptance Methods of Double Horizontal Jibs Gin Pole on Ground for Transmission Tower Erection
 - Standard published
 - P3134 Guide for Drawing Regional Icing Maps for Overhead Transmission Lines
 - Standards under development



Power & Energy Society®

P3554 Standard for Detection Method of X-ray for Transmission Line Conductor Crimping

P3555 Standard for Test Method of Fiber Ropes Used in Construction of Overhead Transmission Lines

P3418 Guide for the Selection of Grounding Devices for Overhead Transmission Line

P3194 Standard for Insulating Scissor-Type Platform for Live-Line Working

P2825 Guide for Static Synchronous Series Compensator (SSSC) General Requirements and Test Methods

2. Benefits to Industry and PES Members from the Committee Work:

The Capacitor Subcommittee is the professional home for engineers involved in the design and operation of capacitor units and banks and other capacitor-related applications. The scope of this committee is the treatment of all shunt and series capacitor matters related to economics, technical design, theoretical and experimental performance, installation, application and service operation for use in power circuits of 60 Hertz and below for the purpose of affecting the performance or operating characteristics of the circuit. Moreover, committee activities include development of not only industry standards, but also educational material, for instance, technical papers, white papers, presentations, tutorials, and panel discussions.

The Distribution Subcommittee's work empowers industry to navigate both the emerging frontiers and critical foundations of distribution systems. It provides guidance on modernizing the grid, addressing AI integration, resilience against disruptions, and the latest smart technologies, while also reinforcing critical legacy aspects like protection and reliability. For PES members, this means leading-edge knowledge, collaborative work, and shaping the future of resilient, AI-ready distribution networks.

The ESMOL Subcommittee focuses on engineering, safety, and maintenance of OHL lines and it is active in updating most of its current standards to the current industry practices. The SC is trying to incorporate recent needs of the industry to add philosophy and practices for 765 kV ac systems, investigate DC system safety, and expand electrical safety to other areas such as arc flash.

The SC is planning on revising IEEE 516 which is the to go guide for OHL maintenance and minimum approach distances too. P1048, guide for temporary grounding of OHL, one of the cornerstones of electrical safety, is out for ballot and thousands of workers use it every year for developing their de-energized work procedures, training, etc. The SC is sponsoring arc flash safety with its WG P3546 on arc flash which is helping the SC gain more interest and members. The power utilities don't count with an arc flash standard, so P3546 will produce good framework for their needs.

The Power Quality Subcommittee supports the industry by supplying case studies, significant research, and standards that bring forth voltage compatibility issues between the utility system and electrical loads or generation equipment. The members within the committee are also members of EPRI, Cigre, and IEC. These members bring in their knowledge from the different organizations to ensure all the standards agree with one another.



Power & Energy Society®

The Transmission Subcommittee provides ability to focus on the treatment, consideration and coordination of all matters related to the transmission electric network reliability, generation and energy storage integration, grid enhancing technologies, and voltage optimization

China Satellite Technical Committee-Transmission & Distribution (TDSTC)

- a. To organize visits and exchanges among subcommittees, conduct cooperation and exchanges with international organizations, strengthen communication through international exchange platforms.
- b. To invite IEEE Fellows and Senior Members to share their experiences on IEEE membership advancement, and invite IEEE standards experts to provide training and insights on the IEEE standards to support member's individual growth and industry development

3. Benefits to Volunteer Participants from the Committee Work:

The distribution committee volunteers directly shape how the distribution system adapts to real challenges. They work on defining practical standards for resilience, reliability, and smart operations. Whether refining protection practices or modernizing grid approaches, their contributions guide real utilities and industry practices. They are not just building networks and connections, they are building the distribution system's future.

ESMOL subcommittee counts with top experts in OHL safety, maintenance, etc. and all members are welcome to share their expertise. Currently, ESMOL SC is sponsoring many SC sponsored technical papers and inviting all members to participate. As discussed in JTCM Adcom meeting, ESMOL SC will offer in the future tutorials on safety and a course on ethics for gaining PDH hours and for helping members with their PE license requirements.

The power quality committee has a diverse membership that ranges from university professors, equipment manufacturers, to utility experts. Some of the working groups are consistently bringing in case studies and field data which provide information and feedback for the academic community.

The Transmission subcommittee provides opportunities to network, coordinate and support growth in the transmission system needs and challenges.

TDSTC invites many scholars, technicians, and other volunteer participants to exchange the latest news and technology trends in the field of power transmission and distribution by organizing annual conferences.

TDSTC emphasizes the growth of volunteers, helps their career development through training, and helps them become senior members of IEEE.

4. Recognition of Outstanding Performance:

Capacitor SC



Power & Energy Society®

Mr. Biswajit Singh, WG chair for P824, has put tremendous effort to finally have the DRAFT of P814 approved by RevCom after 6 rounds of circulation and numbers of back-and-forth exchange with RevCom.

Mr. Biswajit Singh candidacy was submitted for the IEEE PES Charles Concordia Power Systems Engineering Award for his overall contribution to the Power Systems Engineering industry.

Mr. Xuan Wu, WG chair for P18, finally got the DRAFT of P18 approved by RevCom after several rounds of circulation and numbers of back-and-forth exchange with RevCom.

Mr. Timothy Lenberg was nominated as chair of WG P1726 and also as vice-chair of the Capacitor SC. He is a great contributor to the SC for years.

Distribution Subcommittee

Sal Martino, IEEE SA Medallion

Chair working on nominating his reports and active members for multiple targeted awards

ESMOL SC

Mr. Gary Zevenbergen, WG chair for P1048, has done an amazing job in having the WG complete the P1048 final draft and going to ballot.

Dr George Gela has been a long-standing member and supporter of reviewing and drafting ESMOL standards for the past few decades. The SC appreciates his contributions and commitment.

Dr Balint Nemeth and Ms. Nicole Hicks have been great contributing SC officers for ESMOL, and they have contributed to the advancement and outreach of the subcommittee.

Mr. Mike Starner stepped in as ESMO Show Chair, and he has been very active in connecting ESMOL with various industry groups. The intent is to revamp the show in the future (2028).

Dan Sabin has been pivotal in mentoring the different WGs in the power quality subcommittee, he provides great insight where needed, and leads by example.

TDSTC was honored to receive the "IEEE PES Satellite Technical Committee of the Year Award" at the 2026 International Meeting in Hong Kong.

Additional TDSTC:

The following individuals and subcommittee recognized by outstanding performance :

- Outstanding Contribution Award: Jun Lv, Duanjiao Li
- Outstanding Achievement Award: Yang Wang, Chengmeng Chen
- Young Talent Award: Zhengang Lu, Ying Zhang
- Excellent Secretary Award: Bin Liu, Hanru Li
- Excellent Volunteer Award: Jingxin Cui, Xiaomeng Di, Pan xing, Zhang Weihao
- Distinguished Individual in Standard Development Award: Jiajun Si, Changhong Zhang
- Subcommittee Recognition Award: Digitization Technologies for Power Distribution and Utilization Subcommittee, Electric Cable Subcommittee

5. Coordination with Other Entities (PES Committees, CIGRE, standards, etc.):

Distribution subcommittee:

Chair actively involved with CIRED. Published a paper, one report, and working on one policy brief

Chair is engaging his team with CIRED

Chair and his Resilience working group in collaboration with CIRED resilience team

Chair started collaboration with CIGRE

Smart Distribution WG working closely with Sensors SC of PSIM

Coordination and Involvement with Young Professionals:

need to work on this

ESMOL has good partnership with other IEEE Committees such as Switchgear, Transformers, and Substations, and other IEEE Societies such as IAS, IAS-ESW.

ESMOL will be coordinating future panels with Cigre SC B2/B3 for events at JTCM and GM shows.

ESMOL has active participation and collaboration with ANSI, ASTM and IEC TC78, in the development of standards that align practices. ESMOL historically asks ASTM, IEC, and ANSI for support in developing mechanical equipment, tools, and other equipment standards.

The power quality subcommittee has unofficial coordination through our members involvement

- i. A long-standing member currently oversees the C4 study committee within CIGRE
- ii. The chair of ANSI C84.1 provided an update on their standard and offered insight during our WG P2844 Voltage imbalance meeting.

Transmission subcommittee:

- o Coordination between the Reliability of Inverter-Based Resources Working group with the P2800 standards team and NERC in the development of their paper.
- o Coordinating between IEEE SA IC team with the Data Center Interaction TF in Datacenter gap analyses report.

The T&D Committee partners with these Standards Committees as a lead Standards Committee or Co-Standards Committee.

- BOG/CAG Entity Collaborative Activities Governance Board Standards Committee
- Industrial Electronics Society Standards Committee
- PES Insulated Conductors Committee
- PES Power System Instrumentation and Measurements Committee
- PES Power System Relaying and Control Committee
- PES Power System Communications and Cybersecurity Committee
- PES Surge Protective Devices Committee
- PES Substations Committee



Power & Energy Society®

- PES Transformers Committee
- Systems, Man, and Cybernetics Standards Committee

6. Coordination and Involvement with Young Professionals:

ESMOL SC needs coaching for strategies that can help support young professionals. Recently, ESMOL suffered from a drop in membership due to retirements, and from issues

The topic of harmonics and voltage distortion gains a lot of interest amongst the power community. This topic alone brings new faces to power quality subcommittee meetings, especially during the General Meeting where there are more international members.

TDSTC has taken measures to coordinate and involve young professionals by offering platforms for them to interact with seniors, sharing insights and experiences, and encouraging participation in technical discussions and projects. These initiatives aim to foster growth, collaboration, and innovation within the young professional community.

7. New Technologies of Interest to the Committee:

Distribution subcommittee

AI application

Inference impact of AI load

Asset Management

Back engineering of sensors' applications in distribution systems

ESMOL SC: Wildfire safety, DC safe distances, Arc flash safety, Live tools UHV, 1000 kV ac safety, HVDC safety.

Transmission subcommittee:

- o With the quick penetration of power demand from the advanced technologies industry such as Data Centers, the need for a focus group was quickly recognized with the creation of a Task Force.

New Technologies of Interest include transmission and distribution disaster prevention and reduction, and rural electrification and microgrid technology. TDSTC is applying to the LTAC to establish two new subcommittees focused on these areas.

8. Global Involvement

Distribution subcommittee works with CIGRE and CIRED.

ESMOL collaborates with expert members at IEC TC78 Plenary Session, Cigre Paris Session, ASTM F18, and live work shows such as ECOLIM (Europe).

Three of the university professors from the European community and regular members of the PQ subcommittee provided an update on a project they were working on in Europe. The project is to review “New Algorithms for the Evaluation of Flicker in the Context of Modern Electricity Grids.” This new algorithm can affect IEEE 1453 “Standard for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems”

TDSTC promotes global involvement by establishing academic exchange platforms, facilitating technical cooperation between China and other countries in T&D fields, formulating and promoting international standards, and enhancing China's competitiveness in the international arena. Additionally, it focuses on talent development and attracts international experts to participate in China's T&D research and development, fostering global collaboration and innovation in the field.

9. Problems and Concerns:

ESMOL SC membership is still low, but it grew now to 30 members, and about 10-20 interested individuals.

It has been difficult to find WG officers, and the SC lost its 2nd vice-chair. It seems utility sponsorship of members has dropped, and they cannot fund coming to JTCM and GM.

ESMOL requests the support of IEEE SA and T&D Committee for helping the SC create a LinkedIn platform/account.

Power Quality subcommittee members have found that hybrid meetings can be a bit challenging to manage with Jabra devices. The audio doesn't pick up well when a member is speaking near the back of the room, even though it's a small room.

Transmission subcommittee:

- o Duplicate efforts between different groups and entities focusing on similar areas of interests. This is especially prevalent now with Data Center penetration. Working to communicate the existence of the TF in order to include other efforts when developing scope and focus areas.

TDSTC is trying to mobilize each member to join IEEE entity standards development, national standards and power industry standards development.

TDSTC is looking forward to build further connections between T&D Subcommittees and TDSTC Subcommittees, such as online meeting to make introduction, specific technical topic discussion, standard development discussion.



Power & Energy Society®

TDSTC would like to know how to follow up the new standard application process and get comments/feedback from T&D subcommittee efficiency.

10. Significant Plans for the Next Period:

Distribution subcommittee Opening few PARs, publishing few, starting new task forces, and more collaborative panels

ESMOL SC:

Maintain outreach to industry for increasing ESMOL SC and WG membership.

Create a LinkedIn platform for the ESMOL SC and create content to attract new members and interested individuals.

HVDC and FACTS Subcommittee:

The HVDC & FACTS Subcommittee will facilitate the following panels at the 2026 GM:

- 115 HVDC Practical Challenges and Lessons Learned
- 116 Collaborative HVDC research projects: A view on the European R&D landscape
- 117 Powering the Digital Age: How Data Centres Are Driving the Need for FACTS Devices

One more additional is the tutorial that we are sponsoring for PES GM 2026:

- Stability and Resilience in Inverter-Dominated Power Grids: Focus on HVDC Integration and Inverter-Based Renewables

Initial plans for the coming year:

- Preparation of a draft PAR for “Guidelines for the Functional Specification of Voltage-Sourced Converters for HVDC Transmission Stations” has commenced. Once drafted, an invitation will be issued to Subcommittee members to gauge interest in forming a Working Group.
- Abhay Kumar has agreed to serve as the Subcommittee’s Standards Lead. Virtual coordination meetings will be scheduled throughout the year to review relevant standards.
- There is strong momentum within CIGRE B4. The Subcommittee previously identified a CIGRE B4 liaison who has since retired; their continued participation or the appointment of a replacement is to be confirmed. Strengthening coordination with CIGRE B4 remains a priority, and discussions with the B4 Executive will continue to identify areas of synergy.
- The next virtual Subcommittee meeting will take place in February 2026. Meeting invitations will be distributed shortly.

The PQ subcommittee members will host 2 Panel sessions during the 2026 General Meeting. Two of the Working groups are projected to send their updated standards to Revcom by the end of this year.

Transmission subcommittee:



Power & Energy Society®

- o Completion of Technical Reports and/or white papers from the Reliability Impacts of Inverter-Based Resources, Generation and Energy Storage Integration and Grid Enhancing Technologies Working Group.
- o Date Center Interaction with Transmission System Task Force completion of first draft of technical report.
- o Leadership in chairing and sponsoring panels and sessions at PES T & D and GM conferences

TDSTC will invite T&D committee/subcommittee officers visit China to attend 2026 TDSTC Annual meeting and visit some power companies if interested.

TDSTC will promote communications and technical cooperations between PES T&D Subcommittees and TDSTC Subcommittees.

TDSTC members will develop IEEE standards in OHL subcommittee, PQ subcommittee, Capacitor subcommittee, Distribution Subcommittee, ESOML subcommittee and HVDC&FACT subcommittee.

TDSTC will actively promote the establishment of transmission and distribution disaster prevention & reduction subcommittee and rural electrification and microgrid technology subcommittee.

Submitted by: Julio Romero Aguero (Chair) and Brian Johnson (Secretary)

Date: Jan. 30, 2026