Introducing the IEEE PES Transmission Subcommittee



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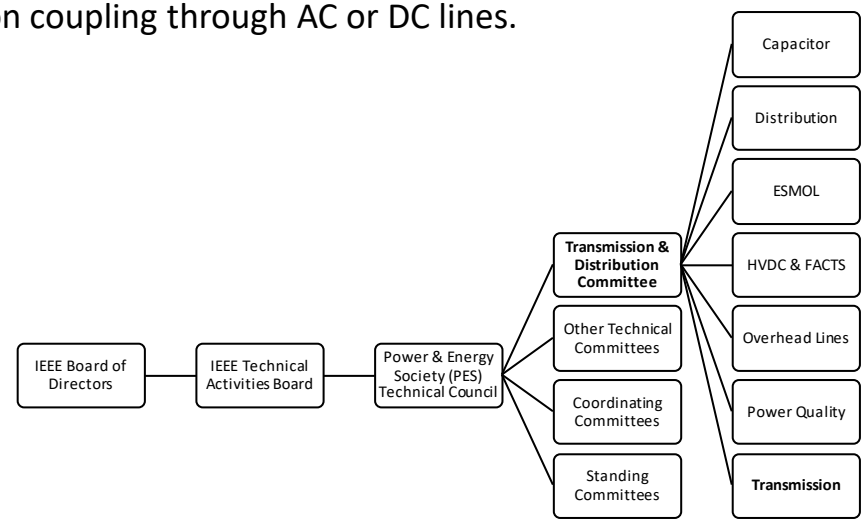
TRANSMISSION & DISTRIBUTION COMMITTEE

The IEEE PES Transmission & Distribution (T&D) Committee focuses on all matters related to the design, theoretical and experimental performance, installation, and service operation of parts of electric power systems that serve to transmit electric energy between the generating sources and substations or customer points of common coupling through AC or DC lines.



The T&D Committee has seven responsible subcommittees. A "responsible subcommittee" is delegated responsibility for approving the submission of PARs and sponsor ballots. Responsible subcommittees assist the T&D Committee in the control and management of its large scope by creating working groups.

DESCRIPTION OF EACH SUBCOMMITTEE

- **Capacitor Subcommittee**: 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 performance or operating characteristics of these circuits.

- **Distribution Subcommittee**: Treatment, consideration and coordination of the economic and technical factors that influence the analysis, design, construction, operation, planning, standardization of components and environmental compatibility of overhead and underground electric distribution systems.

- **Engineering in the Safety, Maintenance and Operation of Lines (ESMOL) Subcommittee**: The treatment of all matters related to the engineering in maintenance of lines and associated devices. Research, development, testing, acceptance of various techniques, practices, and procedures (involving the physical effects and other considerations) as they relate to safety and maintenance of lines and associated devices.

- **HVDC & FACTS Subcommittee:** Treatment of technology related to direct current and flexible alternating current transmission systems. Applications of power electronic switching equipment and ancillary components to AC and DC transmission systems. Coordination of these systems at the interface between transmission and generation and the over-all studies of their parameters and performance.

DESCRIPTION OF EACH SUBCOMMITTEE

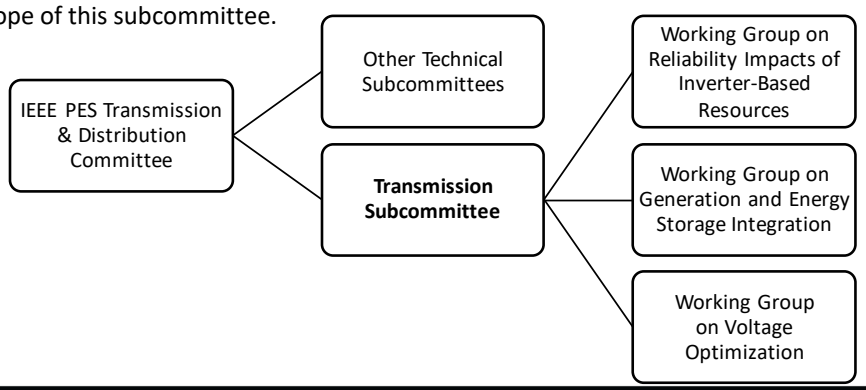
- **Overhead Lines Subcommittee:** Treatment of all matters of economic and technical design, theoretical and experimental performance, installation, and service operation of transmission and distribution conductors and overhead ground wires, their supporting structures, associated splicing and hardware components, and counterpoise and structure grounding. Design, application, and standards for all types of overhead line insulators including attachments to minimize arc damage and control of the electrostatic fields.

- **Power Quality Subcommittee**: Treatment of all matters of definitions, monitoring, benchmarking, assessment, indices, and solutions to power quality phenomena in transmission and distribution systems.

- **Transmission Subcommittee**: Treatment, consideration and coordination of all matters related the transmission electric network reliability, generation and energy storage integration, switching and voltage optimization.

TRANSMISSION SUBCOMMITTEE

- The Transmission Subcommittee's purpose is to technically promote:
- Treatment of matters related to the reliability impacts of inverter-based resources. This task will closely be coordinated with NERC and other reliability councils.
- Treatment of matters relating to the integration of the generating and energy storage facilities with the transmission electric network. The scope of this task includes but not limited to the control of the facilities and impacts on the transmission system.
- Treatment of matters related to the transmission power system switching as well as voltage optimization.
- Sponsorship and development (either alone or jointly with other technical committees and/or organizations) of standards, recommended practices, guidelines, and policies as well as preparation of position papers and/or documents, technical conferences and/or sessions on matters related to areas identified in the scope of the subcommittee.
- Liaison and cooperation with other technical committees, societies, groups, and associations concerned with various aspects of areas that are identified in the scope of this subcommittee.



DESCRIPTION OF EACH WORKING GROUP

Reliability Impacts of Inverter-Based Resources Working Group

- This working group will investigate the challenges to reliability on the Bulk Electric System (BES) posed by the introduction of Inverter-Based Resources (IBR). IBRs have gained in scope and scale and their impacts as resources on the transmission grid are increasingly becoming critical to comprehend to ensure that the electric grid can be operated reliably.

The group expects to begin working on the impacts to transmission reliability resulting from the operations of the following types of resources:

- Photovoltaic resources
- Photovoltaic resources with DC-coupled batteries
- Energy storage devices
- Wind turbine resources
- HVDC transmission lines

The reliability analysis in focus by this working group will include these topics and more:

- Analyze impact of IBRs on steady-state voltage and thermal loading on the transmission system.
- Analyze impact of IBR on transient stability of the transmission system
- Analyze impact of IBR on electromagnetic transients on the transmission system
- Consider impact of electrification and load growth, in conjunction with IBRs

DESCRIPTION OF EACH WORKING GROUP

Generation and Energy Storage Integration Working Group

The scope of this working group is to:

- Gather Industrial perspectives on the network integration challenges associated with different technologies and characterize their impacts on the transmission system.
- Identify the best practices that facilitate modelling of each technology.
- Understand the flexibility and control paradigms offered by each technology. Investigate new industry opportunities for transmission system controllability through power electronics-based solutions (HVDC, FACTS, low-frequency high-voltage AC), energy storage, and inverter-based generation as the power grid evolves.
- Understand the regulatory barriers and challenges associated with wide scale integration of these technologies.
- Provide solutions and recommendations to support integration of new inverter-based generation and energy storage.
- Complement the development of technical standards and technical reports by coordinating research objectives with P2800 and other relevant working groups.

DESCRIPTION OF EACH WORKING GROUP

Voltage Optimization Working Group

The scope of this working group includes all existing, emerging, and under research technologies and methods for improving voltage control and reactive power management in transmission networks. These technologies include but are not limited to the following:

- Traditional voltage control approach
- Wide area centralized voltage control
- Coordinated control of various reactive power devices
- Adaptive zone division method
- Autonomous decentralized control
- Large-scale security-constrained optimal power for online applications
- Day-ahead reactive power scheduling tools
- Supervisory voltage control strategy for renewable generation

The working group plans to complete the following activities:

- Plan, coordinate, develop, and sponsor technical panel sessions pertaining to the Voltage Optimization working group scope.
- Coordinate joined activities with other subcommittees, working groups, and task forces
- Promote the preparation and publishing of technical papers, special feature articles, and special reports relating to the voltage control and reactive power management in transmission systems.
- Act as a liaison to international bodies, technical committees, societies, groups, and individuals that have an interest in the scope of this working group.

INTERESTED IN JOINING THE WORKING GROUPS?

Please contact the leads directly:

- **Reliability impacts of inverter-based resources working group leads:**
- Chair- Samrat Datta: SDATTA@entergy.com
- Vice Chair- Chris Postma: chris.postma@powereng.com
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- **Generation and Energy Storage Integration working group leads:**
- Chair- Rahul Anilkumar: RAnilkumar@Quanta-Technology.com
- Vice Chair- Marcelo Elizondo: Marcelo.Elizondo@pnnl.gov
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- **Voltage Optimization working group leads:**
- Chair- Alberto Del Rosso: adelrosso@epri.com
- Vice Chair- Katelynn Vance: katelynn.a.vance@dominionenergy.com

IEEE PES Power & Energy Society®

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WE ARE CREATING A NEW WORKING GROUP UNDER TRANSMISSION SUBCOMMITTEE

Switching working group

This working group will provide guidance to the industry on how system switching, and operations must evolve to accommodate high penetration of renewables and grid enhancing technologies like dynamic line rating, dynamic power flow controller, energy storage, transmission level EV charging, etc.

If interested in joining this working group, please contact Babak Enayati at: Babak.Enayati@nationalgrid.com

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