

**IEEE Power Engineering Society
Entity Annual Report**

2016

Entity: Transmission and Distribution Committee

Chair: John McDaniel

Vice-Chair: Dan Sabin

Secretary: Gary Chang

1. Significant Accomplishments:

a) Standards, Guides and Reports Summary

Capacitor Subcommittee

- i. PAR for the revision of IEEE Std 1531, Guide for Application and Specification of Harmonic Filters approved on 3/3/2016.
- ii. PAR for the revision of IEEE Std 18, Standard for Shunt Power Capacitors approved on 5/12/16.

Distribution Subcommittee

- i. PAR for new IEEE Std 2030.10, Standard for DC Microgrids for Rural and Remote Electricity Access Applications approved on 3/3/2016..
- ii. IEEE Std 1695, Guide to Understanding, Diagnosing and Mitigating Stray and Contact Voltage approved by IEEE-SA.

Engineering in the Safety, Maintenance and Operation of Lines (ESMOL) Subcommittee

- i. PAR for the revision of IEEE Std 1654, Guide for RF Protection of Personnel Working in the Vicinity of Wireless Communications Antennas Attached to Electric Power Line Structures approved on 9/22/2016.
- ii. IEEE Std 1307, Standard for Fall Protection of Utility Work is currently in ballot resolution. Approval is expected in 2017.
- iii. IEEE Std 1048, Guide for Protective Grounding of Power Lines approved by IEEE-SA.

HVDC & FACTS Subcommittee

None

Overhead Lines Subcommittee

- i. IEEE Std 524, Guide to the Installation of Overhead transmission Line Conductors approved by IEEE-SA.
- ii. PAR extension for the new IEEE Std 751, Guide for Wood Structures Used for Overhead Electric Transmission Lines approved on 3/3/2016.
- iii. PAR for the revision of IEEE Std 656, Standard for the Measurement of Audible Noise from Overhead Transmission Lines approved on 3/3/2016.
- iv. PAR for the revision of IEEE Std 644, Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines approved on 3/3/2016.
- v. PAR for the revision of IEEE Std 1542, Guide for Installation, Maintenance, and Operation of Irrigation Equipment Located Near or Under Power Lines.
- vi. PAR for the revision of IEEE Std 957, Guide for Monitoring, Managing and Cleaning of Contaminated Insulators approved on 9/22/2016.

Power Quality Subcommittee

- i. PAR for the new IEEE Std 519.1, Guide for Applying Harmonic Limits on Power Systems approved on 3/3/2016.
- ii. .

b) Tutorials and Panels Summary

- i. Smart Distribution Systems (tutorial)
- ii. Distribution Volt-var Control and Optimization (tutorial)
- iii. Protection and Control of Distributed Electrical Resources (DER) (tutorial)
- iv. Microgrids: Overview, Design, Analysis, Operation, Control and Applications (tutorial)
- v. Planning and Integration of Flexible HVDC into Today's Grid (tutorial)
- vi. Distribution Automation/Management Systems and Integration with DERS and Microgrids (tutorial)
- vii. Smart Inverters for Distributed Generators (tutorial)
- viii. The 2014 Revision of IEEE Std 519: Harmonic Control in Power Systems (panel – both T&D and GM)
- ix. DMS Integration with DERMS and Microgrid Controllers (panel)
- x. HVDC Transmission Fundamentals (panel)
- xi. Power Quality: A Timely Subject (panel)
- xii. Microgrid Design from a Control Perspective (panel)
- xiii. FACTS & HVDC Installations Transforming the Transmission Grid (panel)
- xiv. Power Quality Issues in Smart Grids (panel)
- xv. Data Analytics: Putting Smart Grid Data to Work (panel)
- xvi. Smart Distribution Application (panel)

- xvii. Microgrid Controller Design and Testing Strategies (panel)
- xxviii. Electrical Signatures of Power Equipment Failures (panel)
- xix. Economics and Operating Experience of HVDC and FACTS – Refurbishment of Existing Facilities and Applications of HVDC Overlays (panel)
- xx. International Interconnection Requirements for Renewable Energy Plants (panel)
- xxi. Implications of DG Interconnection Requirements (panel)
- xxii. DC Transmission Systems with DC/DC Converters (panel)
- xxiii. Interfacing techniques for Smart Grid Simulation Tools (panel)
- xxiv. Flicker Standard-Updates, Applications and Future Direction (panel)
- xxv. Protection Design for Microgrids (panel)
- xxvi. Challenges in Design of Wind and Solar Power Plant Grounding Systems for Personal Safety (panel)
- xxvii. Advanced Distribution Automation – Progress and Challenges (panel)
- xxviii. Hardware-In-the-Loop (HIL) based testing of power apparatus (panel)
- xxix. Modeling and measurement of network and equipment impedances got harmonic studies (panel)
- xxx. EMT-type wind generator models: benchmarks and demonstration of applications (panel)
- xxxi. Microgrid Design Considerations (panel)

c) Other Committee and Subcommittee Activities

- i. ESMOL Subcommittee ran a very successful 13th ESMO Conference in September, 2016. There were over 100 vendors represented at the conference.
- ii. TF on Capacitor Geomagnetic Disturbance Mitigation is currently working on paper. It is expected to be out in 2017.
- iii. Capacitor Subcommittee has added several new working groups.

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

The scope of the Transmission and Distribution Committee is the treatment of all matters related to the design, theoretical and experimental performance, installation, and service operation of parts of electric power systems which serve to transmit electric energy between the generating sources and substations or customer points of common coupling through AC or DC lines. In 2016 the committee has provided benefit to industry by:

- Developing and managing standards and guides pertaining to capacitors, distribution systems, lightning, power quality, overhead lines and the design and integration of renewable energy.
- Providing tutorials and panel sessions on timely topics including wind and solar integration, microgrids, smart grid in transmission and distribution, and distributed energy resources.

- Providing industry with a venue for participating in cutting edge research and best practices dialogs; and participating in the standards making process with over twenty projects in progress or under consideration.
- ESMOL Subcommittee organized the 13th ESMO Conference that took place in September, 2016. Over a hundred vendors were present.

3. Benefits to Volunteer Participants from the Committee Work:

- a) Offering participants an opportunity to work with acknowledged leaders in shaping the T&D industry and informing on T&D issues.
- b) Affords industry leadership role for volunteer participants.

4. Recognition of Outstanding Performance:

- I. Dr. John Grainger received the Award for Excellence in Power Distribution Engineering for *Leadership in Methods for Volt/Var Optimization*.
- II. Mohammad Shahidehpour received the Douglas M. Staszaesky Distribution Award for *The Deployment of a High-reliability Distribution System in a Perfect Power Microgrid at a University Campus*.
- III. Ramabu Adapa received the Nari Hingorani FACTS Award for *In Recognition of his Research in key Projects, Conferences and Meetings in Custom Power*.

The following members of the T&D Committee were elevated to IEEE Fellow this past year: G. Larry Clark, Michael Henderson, Robert Nelson, Daniel Sabin and Silverio Visacro.

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

- a). Smart Grid Coordinating Committee
- b). 1547.7 Working Group
- c). PES Emerging Technology Coordinating Committee
- d). PES Wind Integration Coordinating Committee
- e). Liaison with PSOPE Committee
- f). Liaisons with numerous IEC, CIRED and CIGRE committees
- g). Liaisons with numerous NESC and ANSI committees.

6. New Technologies of Interest to the Committee:

There are several areas of New Technology interest with the T&D Committee. Smart Grids continue to be of interest, especially Smart Meters and their requirements. Another area of interest to the committee is microgrids.

8. Significant Plans for the Next Period:

- a) With the reorganization of the PES, the following subcommittees moved to new committees:
 - i. General Systems moved to the Analytics Methods for Power Systems Committee (minus the Lightning Performance of OH Lines WG, which will stay within T&D)
 - ii. Integration of Renewable Energy into T&D Grids moved to the Energy Development & Power Generation Committee.

Submitted by: John McDaniel

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