

IEEE Power and Energy Society 2015 Entity Annual Report

Entity: Substations Committee

Chair: Markus Etter

Vice-Chair: Diane Watkins

Secretary: Joe Gravelle

1. Significant Accomplishments (include details and examples):

a. Standards -- Substations Committee currently manages 57 standards. Of these, 42 were in active development in 2015, with the following deliverables:

1) Publishing:

- P80 Revision – Guide for Safety in AC Substation Grounding
- P837 Revision – Standard for Qualifying Permanent Grounding Connections used in Substations
- P980 Revision – Guide for Containment and Control of Oil Spills in Substations
- P1264 Revision – Guide for Animal Deterrents for Electric Power Supply Stations.
- IEEE issued a press release in June, 2015 on the availability of IEEE 1264. It's IEEE-SA's first release including a video element. For details of the release, please see http://standards.ieee.org/news/2015/ieee_1264.html
- P1815.1 New – Standard for Exchanging Information between Networks Implementing IEC 61850 and IEEE Std 1815 (Distributed Network Protocol – DNP3)
- PC37.123 Guide for Specifications for High Voltage Gas-Insulated Substations Rated Above 52 kV
- PC37.122.4 New – Application and User Guide for Gas-Insulated Transmission Lines (GIL) Rated 72.5 kV and Above

2) Balloting:

- P525 Revision – Guide for Cable Systems in Substations
- P1268 Revision – Guide for Safety in the Installation of Mobile Substation Equipment
- PC37.122.4 New – Application and User Guide for Gas Insulated Transmission Lines (GIL), Rated 72.5kV and Above
- PC37.123 New – Guide for Specifications for High Voltage Gas-Insulated Substations Rated 52kV and Above

b. Tutorials and Panels Summary

- 1) Annual Meeting, Minneapolis, MN – Three tutorials presented
 - Tutorial on 1815 & 1815.1 – Distributed Network Protocol (DNP3) and Mapping DNP3 to IEC 61850
 - Tutorial 980 – Guide for Oil Containment Systems
 - Tutorial 998 – Direct Lightning Shielding of Substations
- 2) GM 2015, Denver, CO
 - Panel Session on Online Condition Monitoring – Experience and Evolution
 - Paper forum session on various substation related topics
 - 14 papers hosted in the Poster Session
- 3) A member of the Substations Committee serves as Editor of the Transaction of Power Delivery. His work included the review of more than 60 papers; many of which were selected for publication.

c. Other Committee and Subcommittee Activities

- 1) The Annual Meeting of the Substations Committee was held in Minneapolis, Minnesota, and hosted by Xcel Energy. The administrative subcommittee (B0) also met at the PES General Meeting in Denver, CO in July.
- 2) Other Subcommittee meetings were held at the JTCM in January, the General Meeting in July, the PSRC meeting in September, and at Nashville in October.
- 3) The substation committee sponsors a "Special Issue on Modern Substation Technologies", which will be published in the IEEE Transaction of Power Delivery. A Guest Editorial Board was organized, which issued a call for papers. 85 short papers were submitted; the board selected 22 papers and requested the authors to submit a full paper by end of January 2016. It is expected that around 20 papers will be published in the in the Transaction of Power Delivery.

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

The most notable activity of the Substations Committee is the revision and updating of standards and guides, and initiating work on new standards. These standards are widely utilized and provide the most direct benefit to the industry.

In addition to standards work, the Substations Committee donated \$5,000 to the PES Scholarship Initiative to support university students pursuing degrees in engineering.

3. Benefits to Volunteer Participants from the Committee Work:

Participants have benefited from their collaboration on technical problems with industry leaders and experts, discussing contemporary industry problems and concerns, and the satisfaction of creating standards and guides that are useful to the industry. Committee meetings have included presentations of experts in specific fields and debating of ideas and industry practices, including CIGRE member input. Substations Committee members have also benefited from their exposure to technical paper reviews and technical paper presentations.

Substations are considered strategic assets, and a number of their components are now reaching the end of their original design life. Valuable information is exchanged on the modern design approaches and explaining new technologies, as well as the issues specific to new technology and suggested improvements for the electric power industry market; for example, Voltage-Source Converters (VSC) and IEC 61850 protocols.

4. Recognition of Outstanding Performance:

- 1) Substations Committee Distinguished Individual Service: **George G. Karady** for his many years of leadership and dedicated service to the Substations Committee developing standards to improve performance and reliability of high voltage power electronics technology worldwide.
- 2) IEEE PES Technical Committee Working Group Recognition Award: K11 – IEEE Guide for Gas-Insulated Substations Rated above 52kV – Chair David Solhtalab
- 3) Certificate of Appreciation to Subcommittee Chair: **Hamid Sharifnia** For his leadership and dedication in performing the function of Standards Coordinator for the Substations Committee – S0 from 2009 to 2015.
- 4) Certificate of Appreciation to Past Chair – **Mike Dood** For six years of outstanding and dedicated service to B0 as Secretary, Vice Chair, and Chair of the Substations Committee.
- 5) Certificate of Appreciation to Subcommittee Chair – **Joe Gravelle** for his leadership and dedication in performing the Chair function of the T&D Substation Operations Subcommittee – E0 from 2010 to 2015.
- 6) Certificate of Appreciation to Subcommittee Chair – **Rich Keil** for his leadership and dedication in performing the Chair function of the T&D Substation Design Subcommittee – D0 from 2009 to 2015.
- 7) IEEE-SA Recognition: **John Randolph** for successful balloting of IEEE 1264 “Guide for the Animal Deterrents for Electric Power Supply stations”
- 8) IEEE SA issues a press release on the availability of IEEE 1264. It's IEEE-SA's first release including a video element. For details of the release, please see http://standards.ieee.org/news/2015/ieee_1264.html
- 9) IEEE-SA Recognition: **David Kelley** for successful balloting of IEEE 837 “Standard for Qualifying Permanent Connections Used in Electrical Power Substation Grounding”
- 10) IEEE-SA Recognition: **James Sosinski** for successfully balloting IEEE980 “Guide for Containment and Control of Oil Spills in Substations”

- 11) IEEE Board of Directors: 2016 IEEE Charles Proteus Steinmetz Award recipient **Herman Koch** for exceptional contributions to the development and advancement of standards in electrical and electronic engineering. For leadership and contributions for the development, standardization and global impact of gas-insulating technology for substations (GIS) and high-voltage lines (GIL).

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

- 1) IEC – IEEE liaison Herman Koch presented activities with IEC including: Status Reports SC 17C, and SC17A.
- 2) CIGRE – US national committee supports Grid of the Future, Chicago in November 11 – 13. Next year Grid of the Future will be in Philadelphia, October 30th. Two extra days to hold a colloquium with C1 on Grid codes.
- 3) CIGRE - During the Substations Committee B0 meeting at PES General meeting, Nic Fantana presented on Substation Servicing and Supervision Using Mobile Devices and Smart Sensing CIGRE WG B3.44
- 4) PSRC –Ongoing Joint work with the following standards:
 - New Cyber Security standard PC37.240
 - Time synchronization standard PC37.238.
 - H23*/SUBS C18: Guide for Naming IEDs (COMDEV)
 - H24-1/SUBS C7: Revision of IEEE STD profile for the use of IEEE1588 Precision Time Protocol
 - I31/ SUBS C2*: Environmental & Testing Req. for Communications Networking Devices (IEEE 1613/1613.1)
 - H3/SUB C4: Time tagging in Protection and Disturbance Recording IED's
 - H22/SUB C19: Guide for Cyber Security for Protection Related Data Files
- 5) T&D – Joint work on 1613.1
- 6) NESC – Bruce Dietzman represented the Substations Committee at the NESC - Subcommittee 3 – Electric Supply Stations meeting held at the IEEE headquarters in Piscataway, NJ on October 8, 2015. This is the last subcommittee meeting before submittal of the 2017 NESC to the main committee for approval. Final approval and publication will occur by the end of 2016.

6. New Technologies of Interest to the Committee:

- 1) Voltage-Source Converters (VSC)
- 2) Environmental testing based upon 1613/1613.1

7. Significant Plans for the Next Period:

- 1) Annual meeting in Atlanta Georgia in May 2016, including numerous Tutorials
- 2) Further engage with Intelligent Grid CC and any key standards development
- 3) Nominate several Fellow candidates

- 4) Nominate members for IEEE achievement awards
- 5) Execute IEEE PES Technical Council's plan on technical reorganization
- 6) Publish 2 standards that are due in balloting
- 7) Ballot 10 standards that are planned for 2016
- 8) Technical Paper Panel Session at PES General Meeting in Boston, MA
- 9) Tutorials at 2016 GM in Boston, MA

8. Problems and Concerns:

The main concern of the Substations Committee is the decline of utility support of their engineers' participation in IEEE PES activities, due to budget cuts, perceptions, etc.

In addition, those members who are active have a heavy workload with their employers, making it difficult to sometimes meet their working group commitments, which can adversely affect providing valuable information via tutorials, technical discussions, social networking, and other presentations.

Another major challenge facing the Substations Committee is the retirement (impending and actual) of many of the current major contributors, and the need for recruitment of younger engineers to participate on the Committee.

In general the Substations Committee is supportive of the IEEE PES Reorganization. We know there will be challenges incorporating the changes with the reorganization. We will continue to work with PES to support and implement the reorganization efforts.

Submitted by: Markus Etter

Date: 1/7/2016