

2018

**Entity: Substations Committee**

**Chair: Diane Watkins**

**Vice-Chair: Joe Gravelle**

**Secretary: Patrick Fitzgerald**

**1. Significant Accomplishments:**

- a. Standards – Substations Committee currently manages 48 standards, of these, 24 were in active development in 2017, with the following deliverables:
  - i. Publishing:
    - P1052 – Guide for the Functional Specifications for Transmission Static Synchronous Compensator (STATCOM) Systems
    - P693 – Recommended Practices for Seismic Design of Substations
  - ii. Balloting/recirculation:
    - P1267 – Development of Specification for Turnkey Substation Projects
  - iii. New PAR approval:
    - D2 – 525 - Guide for the Design and Installation of Cable Systems in Substations
    - D7 – 80 - Substation Grounding Safety
    - E3 – 979 - Guide for Substation Fire Protection
    - E4 – 1246 - Guide for Temporary Protective Grounding Systems used in Substations
    - I10 – 2656 - Guide for Functional Specification of Voltage-Sourced Converter for HVDC Stations
    - K1 – C37.122 - Standard for High Voltage Gas-Insulated Substations Rated Above 52kV
- b. Tutorials and Panels Summary
  - i. Annual Meeting Scottsdale, AZ
    - IEEE STD 980 Guide for Oil Containment Systems
    - I0 Gave a tutorial on Transmission Shunt Compensation
    - D2 Gave a tutorial on Design and Installation of Cable Systems in Substations
  - ii. GM 2018 Portland, OR
    - 4 papers hosted in the Poster Session
      - a. Start-up Issues and strategies of MMC-based Multiport Solid State Transformer
      - b. Model predictive control of single-phase Grid-Connected Voltage Sourced Converters
      - c. Grid-Forming Droop Control of a Modular Multilevel Converter in Laboratory

- d. A Multilevel dual converter fed Open end Transformer Configuration for Hybrid AC-DC Microgrid
- c. Other Committee and Subcommittee Activities
  - i. The Annual Meeting of the Substations Committee was held in Scottsdale, Az. The meeting was hosted by Salt River Project. The administrative subcommittee (B0) also met at the PES General Meeting in Portland, OR in July.
  - ii. Other Subcommittee meetings were held at the JTCM in Jacksonville, FL in January, and the General Meeting in July.

## **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

The Substations Committee also started a program to help support young professionals and experienced contributors by starting an assistance program that will allow members from these groups to get financial assistance for meeting registration and hotel accommodations to attend working group meetings.

## **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.

Active participants also have opportunities to take on leadership roles and improving their leadership skills as well as mentoring skills working with teams with a variety of experience in technical and organizational activities.

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), IEC 61850 protocols, and looking into alternative gas for gas insulated equipment.

## **4. Recognition of Outstanding Performance:**

- a. IEEE PES Technical Committee Working Group Recognition Award: Guide for the Design of Low Voltage Auxiliary Systems for Electric Power Substations; Co-chairs Hanna Abdallah & Joseph Gravelle
- b. IEEE PES Technical Committee Working Group Chair Award George Becker, Past chair of K0

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

- a. IEC – IEEE liaison Herman Koch presented activities with IEC including: Status Reports SC 17C, and SC17A.
- b. CIGRE – US national committee supports Grid of the Future, Reston, VA October 28-31 2018.
- c. T&D – Joint work on 1613.1
- d. Switchgear Committee Joint Work :

- i. Joint Standards C37.20.9 Standard for Metal-Enclosed Switchgear Rated 1 kV to 52 kV Incorporating Gas Insulating Systems – George Becker WG Vice Chair and Liaison from K0 – Published
  - ii. Joint Standard C37.122 Standard for High Voltage Gas-Insulated Substations Rated Above 52 kV –Ryan Stone Chair and Liaison from K0 – Revision started
  - iii. Task Force on Alternative Gases-George Becker, Arnaud Ficheux, and Peter Grossman, Liaison form K0
  - e. NESC – Bruce Dietzman represented the Substations Committee at the NESC - Subcommittee 3 – Electric Supply Stations meeting
- 6. New Technologies of Interest to the Committee:**
- a. HEMP – High-altitude electromagnetic pulse, and IEMI- Intentional Electromagnetic Interference
  - b. Voltage-Source Converters (VSC)
  - c. Alternative Gases for SF6 Equipment
- 7. Significant Plans for the Next Period:**
- a. JTCM meeting in Garden Grove California in January 2019.
  - b. Annual meeting in San Francisco, California in June 2019, including numerous Tutorials
  - c. Further engage with Intelligent Grid CC and any key standards development
  - d. Nominate Fellow candidates
  - e. Nominate members for IEEE achievement awards
  - f. Publish 1 standard that is due in balloting
  - g. Ballot 3 standards that are planned for 2019.
  - h. Technical Paper Panel Session at 2020 T&D Expo in Chicago IL
  - i. Tutorials at 2020 T&D Expo in Chicago IL
  - j. Panel Sessions at 2020 T&D Expo in Chicago IL
  - k. Technical Paper Panel Session at PES General Meeting in Atlanta GA

**Submitted by:** \_\_\_\_\_ **Date:** 1/15/19