

<http://sites.ieee.org/pes-essb/>

**Chair:** Chris Searles

**Vice-Chair:** Curtis Ashton

**Secretary:** Bill Cantor

### **1. Significant Accomplishments:**

The IEEE ESSB Committee successfully integrated the former Stationary Battery Committee (SBC) into the expanded ESSB Committee in 2016. The Committee meets twice a year and has grown in attendance from an average of approximately 40 – 50 attendees to 70+ at the last two meetings. There are currently 68 persons registered as official members of ESSB. There were several significant accomplishments over the course of 2016:

1. Despite a skeptical response to the reorganization effort by several long-time members of the original SBC, only 2 members resigned after the first ESSB meeting. Since then, we have formed an excellent team of officers and an Administrative Committee that has met three times including our Committee General Meetings to map out a strategy and action plans to grow the Committee with not only members, but subject matter experts that can help move us into the ESS arena for both technical and standards development.
2. The Committee agreed to appoint a Treasurer who serves as an Officer of the ESSB Committee. It is anticipated this will allow ESSB to provide funding for priorities agreed upon by the Committee,
3. At a strategic planning meeting at the Chicago O’Hare Hilton on October 21, the Committee invited Paul Sullivan from the IEEE Switchgear Committee to join us and share his experiences in successfully growing that committee within IEEE PES. This proved valuable as we voted at that meeting to:
  - a. investigate using a sign-up and reservation program to aid registration at meetings,
  - b. investigate using the MEC group within IEEE to assist in setting up future meetings,
  - c. form a program to add sponsorships to assist in financing critical Committee priorities
  - d. actively pursue ESS opportunities, and
  - e. play a cooperative and hopefully leading role in our area of expertise within IEEE PES and the IEEE PES Technical Council.
4. The Committee has aggressively engaged with other ESS groups to understand their roles within this industry and determine how liaison efforts can be made to establish ESSB as a principal (and eventually leading) player in the development of ESS standards (see #7 below).

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

The IEEE ESSB currently has 26 IEEE technical standards that play a significant role in the stationary battery marketplace. These standards form the basis of best practices for all users of standby backup battery power applications, and encompass the applications within the electric utility, industrial, telecommunications and data center/server/cloud computing markets. IEEE 535 is a standard that determines battery qualification accepted by the Nuclear Regulatory Commission (NRC). IEEE 450 is the demand standard for maintenance, testing and replacement of batteries all United States nuclear power plants as well as serving as the basis for Vented Lead Acid (VLA) battery maintenance and testing for a major portion of companies that utilize VLA cells.

Currently 12 separate working groups are writing new standards (4) or updating existing standards (8) to ensure that the ESSB areas of technical guidance is current. Four standards deal specifically with the new area of energy storage: [1] IEEE 1679 – Emerging Energy Storage Technologies in Stationary Applications; [2] IEEE 1679.1 – Guide for the Characterization and Evaluation of Lithium Based Batteries for Stationary Applications; [3] IEEE 1679.2 – Guide for the Characterization and Evaluation of Sodium Based Batteries for Stationary Applications; and [4] IEEE 1660 – IEEE Guide for Application and Management of Stationary Batteries Used in Cycling Service (i.e. renewables).

It is our intention to propose, and when approved, initiate new working group activity in several areas in 2017 & 2018. These include [1] Guide for Selecting Engine Starting Batteries; [2] Guide for Application and Management of Lithium Based Batteries for Energy Storage Applications, [3] Guide for Application and Management of Sodium Based Batteries for Energy Storage Applications; [4] Guide for Application and Management of Flow Batteries for Energy Storage Applications; [5] Guide for Application and Management of Flywheels for Energy Storage Applications, [6] Recommended practice for Maintenance, Testing and Replacement of Energy Storage Batteries – [a] Lithium, [b] Sodium, [c] Flow batteries. Of course, the initiation of all these standards are dependent upon enlisting the necessary subject matter experts in the various fields listed above, prioritization by the Committee and formal SA approval. Other proposed working groups could be proposed in lieu of some of these listed depending upon industry or marketing needs.

### **3. Benefits to Volunteer Participants from the Committee Work:**

The IEEE ESSB currently benefits the battery industry as a whole (users, manufacturers, testing and installation enterprises, consultants and systems integrators) by providing a framework of guidelines, best practices and two standards (IEEE 535 and IEEE 1881) that contribute to the reliability, characteristics and performance of stationary battery and energy storage applications.

A second benefit is that interested parties outside the actual Committee membership attend to increase their knowledge and understanding of the principles and technical characteristics not only in the areas of batteries, but expand their knowledge in complimentary areas that are synergistic with battery and energy storage technologies. In the past year, technical sessions have been held on Arc Flash, Safety Codes and Standards, DC System Failure modes, Batteries Used in Partial State of Charge, to name just a few.

In addition to holding two 2-hour technical sessions at each general meeting, each session's presentations are posted in the Documents section of the ESSB website for public access to review and/or gain information from the material presented at these sessions. This has improved the knowledge base of members and guests alike, as well as providing a library for historical reference. These can be accessed at <http://sites.ieee.org/pes-essb/>.

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

The IEEE ESSB Committee has instigated an active effort to recognize outstanding performance of individual efforts within the ESSB. In the past, we recognized the outgoing Chair of the Committee upon the expiration of his term. With the assistance of the AdCom Awards Chair we have initiated an effort to identify at least one individual from a Working Group who has made an outstanding contribution or effort as well as taking a serious look at PES awards available for outstanding efforts.

The ESSB has also begun efforts in 2016 to identify a worthy Fellows candidate and started the effort required to apply for consideration in the 2018 year.

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

This is an area where the Committee Chair along with assistance from the Vice-chair and Secretary have aggressively engaged with other entities to understand efforts already underway in other groups involved in working on standards or technical efforts with ESS. This includes active participation in the Energy Storage Association, EPRI/ESIC, SCC 21, NECA, NFPA, ESNA to name a few. Significantly, the Chair was appointed by the Technical Council as an “official” liaison to the IEEE SA SCC 21 Committee along with another IEEE PES Committee Chair. Subsequently he has been appointed as an Official member of the SCC 21 Committee (a small group) and appointed as a Co-Chair with an officer of SCC 21 to determine how SCC 21 and the ESSB can coalesce together in areas of overlap. He will be presenting at an upcoming meeting of SCC 21 in concert with the Chair of SCC 21 and the Co-Chair of this Task Force created for this purpose.

We are looking to see how we can coordinate with certain ESS standards development currently going on with EPRI/ESIC, NECA (we have been made participating members of a Canvass Group that reviews installation and testing standards for the Electrical Contractors involved with energy storage) NFPA (NFPA 70E) as well as the new Energy Storage Codes and Standards (NEC 480 and 706).

We also recognize that there is some overlap interest in the standards efforts of other Committees within IEEE PES and the IEEE Industrial Applications Society. However, the Committee is not able to investigate those overlaps at this time as it is a matter of prioritization and resource availability. It is our hope that we can grow over the next several years to have enough volunteers to devote personnel to these areas. Of course, if IEEE PES can provide personnel or assistance in these areas, the Committee would welcome the help in order to see if some standards development work done by those Committees or Society should liaise with ESSB.

#### **6. New Technologies of Interest to the Committee:**

There are several areas of interest in new technologies. The Vice-chair and Chair visited the Sandia Labs to investigate the work of that laboratory as a chief R&D source for energy storage development. The results of that visit will be 2017 efforts so are not presented in this report. Areas of interest include those identified in Section 2 above – new energy storage technologies including those beyond new battery technologies. These would include forms of mechanical, thermal, and other ESS technologies.

#### **7. Significant Plans for the Next Period:**

The ESSB Committee has several significant plans for 2017:

1. Conduct a major 4-hour Technical Symposium at our upcoming June General Meeting. We have engaged the Past-Chair of the PES Technical Council along with the Manager of Energy Storage Technology and Systems from the Sandia Labs to assist our Vice-chair in this effort.
2. Actively host our first Panel Session at the upcoming PES General Meeting in Chicago.
3. Actively participate as permitted in the upcoming PES Super Session on Energy Storage at the PES GM in Chicago.
4. Consider transferring some of the more interesting or relevant presentations to the IEEE PES Resources site.
5. Actively continue our liaison effort with SCC 21 to accomplish mutually acceptable objectives where energy storage is involved.

6. Actively engage supporters to contribute to ESSB efforts financially to allow more aggressive engagement in building membership.
7. Actively work closely with IEEE PES TC and PES Officers to take advantage of the assistance offered to reach areas within and external to PES that will bring in new members.
8. Consider showcasing the development and balloting of an energy storage standard for use as a webinar or video as part of the IEEE PES priority to increase PES awareness.

**8. Global Involvement**

PES is looking to increase involvement with members from Regions 8, 9 and 10 (Africa, Europe, Middle East, Latin America, Asia and Pacific). Please provide the following information

Total Number of committee members	Officers from regions 8,9 and 10	Subcommittee officers from regions 8, 9 and 10	Subcommittee members from regions 8,9, and 10
66	1	1	1

Currently we have one actively engaged member from overseas (New Zealand). He serves as a Working Group Chair and our Committee webmaster. We have enlisted one new candidate from Costa Rica. He attended our last meeting but we cannot call him a member at the current time. We will investigate how we engage others from outside North America, perhaps by creating satellite groups under our jurisdiction. But again, this is a function of prioritization and resources.

**Submitted by: Chris Searles, Chair, Energy Storage and Stationary Battery Committee      Date: January 30 2017**