

A Condensed History of IEEE and PES

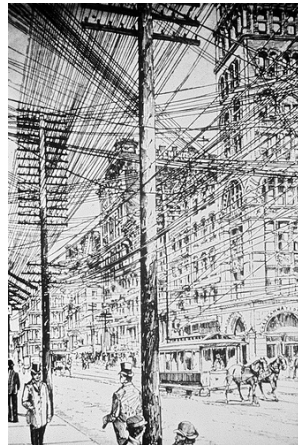
Robert A Dent. Chair
IEEE PES History Committee
July 2014



Communications: The first important electrical technology



Franklin Pope,
telegraph operator



Telegraph line
congestion



A. G. Bell



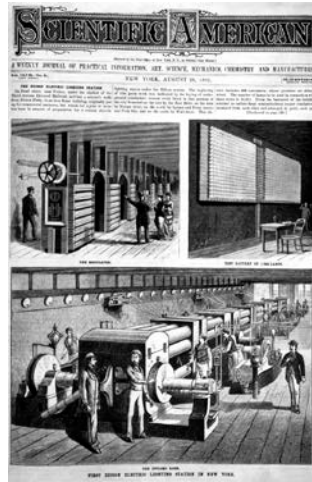
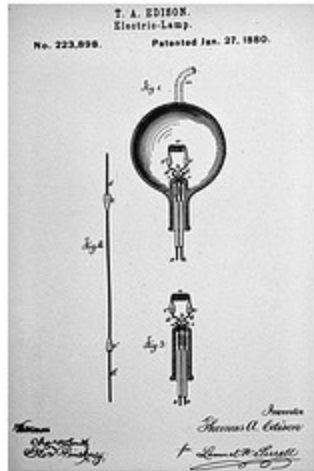
Telephone set, 1882

Samuel Morse's first US telegraph line connected Washington and Baltimore in 1844. By 1866, a telegraph cable connected the United States and Europe. Alexander Graham Bell followed in 1876 with a telegraph that talked—the telephone.

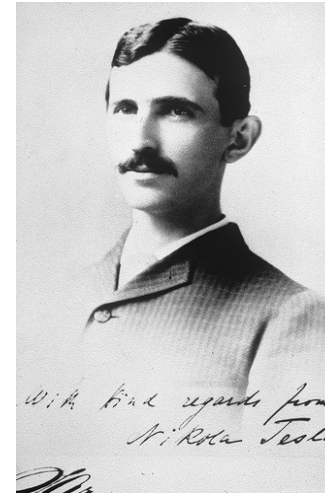
A New Industry: Electric Power and Light



Thomas Edison and his incandescent light patent



Edison's first commercial plant, Pearl St., NY 1882



Nikola Tesla, inventor of the induction motor and a comprehensive system for polyphase AC power



Using an electric iron by an electric light, 1906

Electric power and light systems arose primarily from Thomas Edison's work. Edison opened his first electric power plant in New York in 1882. Within a decade, electric power had spread to every corner of the globe, with many new applications. The AIEE became dominated by power engineers.

INTERNATIONAL
ELECTRICAL
EXHIBITION 1884



OF THE FRANKLIN INST. PHILADA., PA.

TO OPEN TUE. SEPT. 2ND 1884.

TO CLOSE SAT. OCT. 11TH 1884.

N. S. Keith distributed a proposal to interested parties for an American national scientific society. The proposal was supported by many and an initial meeting was held in New York in April 15, 1884. An organizing committee was formed.

A second organizing meeting was held on May 13, 1884. A slate of officers was presented and voted upon.

Norvin Green, President

Six Vice Presidents were also selected
Alexander Graham Bell, Charles R. Cross,
Thomas A. Edison, George A. Hamilton,
Charles H. Haskins, and Frank L. Pope

1884: The American Institute of Electrical Engineers is Founded

I think these might be advantageously introduced into this country, if not for general use, at least for particular cases where high insulation is a necessity.

An American Institute of Electrical Engineers.

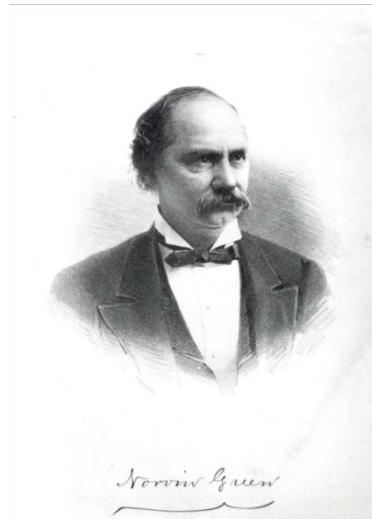
We give below the "call" that has been issued for the purpose of establishing a national electrical society to which it is suggested to give the name of the "American Institute of Electrical Engineers." We print also the names of the electricians and capitalists and others prominently connected with electrical enterprises, who have already given their hearty adhesion to the project:

The rapidly growing art of producing and utilizing electricity has no assistance from any American national scientific society. There is no legitimate excuse for this implied absence of scientific interest, except it be the short-sighted plea that every one is too busy to give time to scientific, practical and social intercourse, which, in other professions, have been found so conducive to advancement.

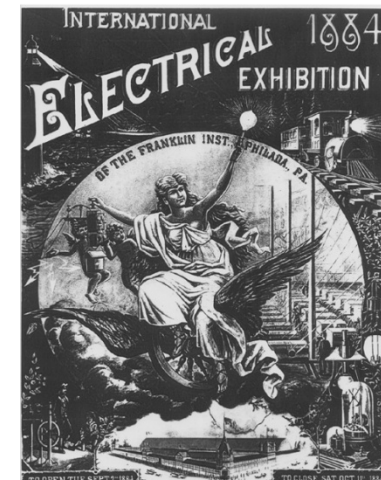
The American Societies of Civil, Mechanical and Mining

N. S. Ketch
E. A. Leff
Thos. Mac
C. O. Mall
James W.
W. H. Mc
George B.
Frank L. I
H. C. Roor
S. D. Coha
George B.
J. A. Sood
Frank Ste
Charles S.
Georrt Su
Geo. W. I
Thos. R. I
L. G. TIB
P. H. Van
Chas. J. V
D. Van N
Edward

Further
Broadwa



Norvin Green, President of Western Union Telegraph, and first president of the AIEE



Program of the 1884 International Electrical Exhibition, Franklin Institute, Philadelphia

Invitation to the AIEE organizational meeting, *Electrical World*, April 5, 1884

A small group of individuals met in New York to found the AIEE to advance the new field and represent the US at the 1884 International Electrical Exhibition in Philadelphia. Norvin Green of Western Union became the first president.

International Happenings

- While the movement to form the American Institute of Electrical Engineers was occurring in America, similar events were happening worldwide.
- There was excitement about the uses of electricity around the world. Many organizations were being formed to bring practitioners and researchers together, create standards and disseminate information.
- IEE founded in 1871, VDE in 1893, IEEJ in 1888, IEC in 1906, CIGRE in 1921 and CSEE in 1934

Electrical Engineering Education Becomes Established



Early electrical engineering lab, MIT



Professor Dugald Jackson chaired the
EE departments first at Wisconsin
and then MIT



Electrical Engineering Class, Cornell U.,
1916

MIT established the first electrical engineering program in 1882 in the physics department. Within a few decades, there were dozens of independent departments in universities across the country, and young engineers typically began their careers with university educations. Curricula were generally heavily oriented towards power engineering. AIEE established the grade of student member, and in 1903, authorized the formation of campus-based student branches.





AIEE Structure

- From its founding in 1884, AIEE operated essentially out of New York City. The first two sections established in 1902 in Chicago, IL, USA and Ithaca, NY, USA. In 1903, the first non-American section was formed in Toronto, Canada.
- In 1891, standardization was started by forming a committee on units and standards.
- The first technical committee in the AIEE was formed in 1903 and was named the High Voltage Transmission Committee.

The Birth of Radio



Guglielmo Marconi, and George Kemp with equipment used in transatlantic wireless telegraphy, 1901



Radio telegraph operators' communications with the sinking Titanic demonstrated the power of radio ,1912.



Triode vacuum tube inventor Lee de Forest with a radio, 1922

Radio, a new electrical technology, arose in the first decade of the twentieth century. Wireless telegraphy using spark transmitters was the original application, but particularly after the invention of the vacuum tube amplifier, it began to be used to transmit speech and music.

Formation of the IRE, 1912



IRE logo



IRE annual banquet, NY, 1915. Among those attending were Tesla, Sarnoff, de Forest, and Alexanderson



Alfred Goldsmith, IRE Co-founder, and first journal editor

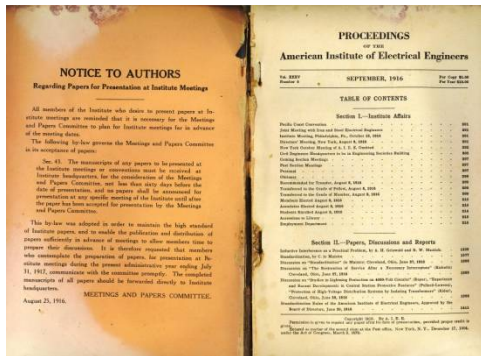
With the new industry came a new society in 1912, the Institute of Radio Engineers or IRE, modeled on the AIEE, but devoted to radio, and later increasingly to electronics.



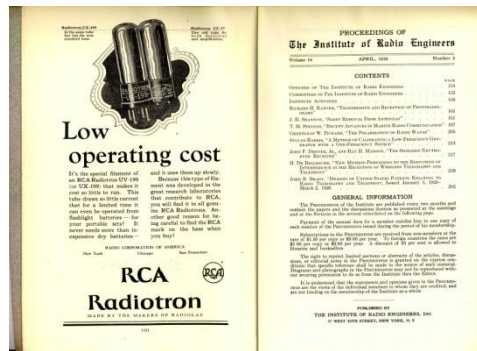
IRE Structure

- IRE founders intended to initiate an international organization from the beginning.
- *The Proceedings of the IRE* was issued in 1913 to disseminate technical information to members in practice and in research.
- IRE organized regional and professional groups in 1914 and 1948, respectively.

AIEE and IRE serve their members and their professions



Proceedings of the AIEE, September 1916



Proceedings of the IRE September 1926



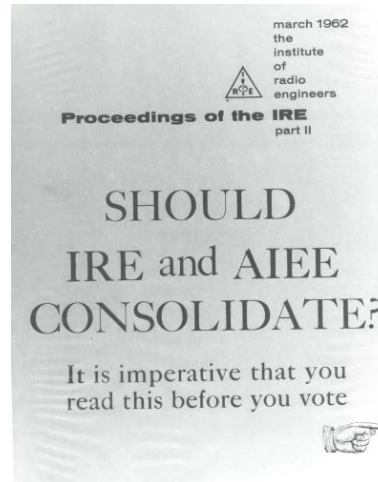
NBC engineers at an IRE banquet

To a large extent, the IRE modeled itself on the AIEE. Both societies ran technical conferences, established local chapters, published journals, promulgated standards, and encouraged the training of student engineers.

AIEE + IRE = IEEE



Symposium on the proposed merger.
IRE National Convention, 1962



Special merger issue of the
Proceedings of the IRE



The badge of the new IEEE combined the right hand
rule from the IRE with the kite from the AIEE

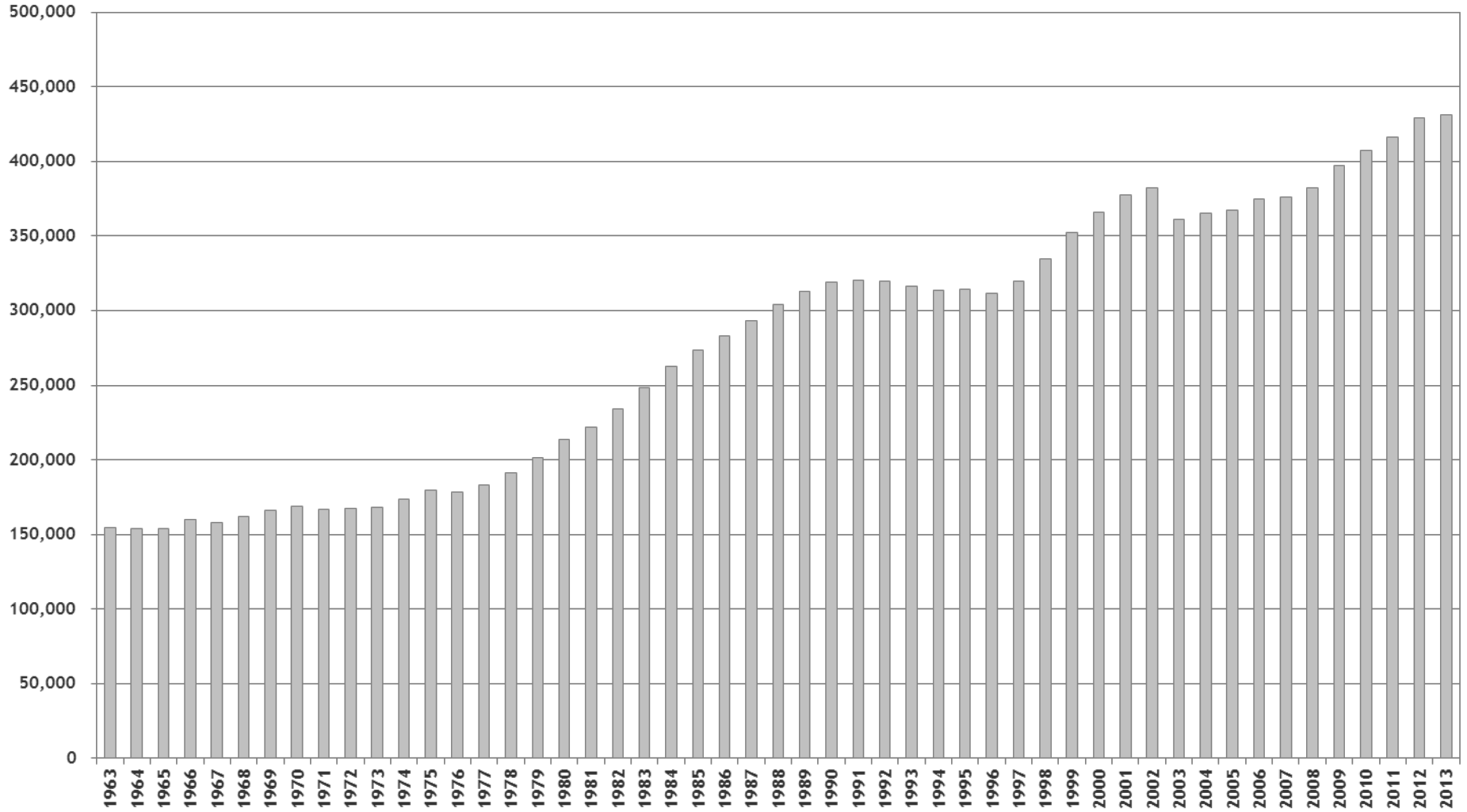
The idea that there should be one organization for all electrical engineers was an old one, and became more powerful as the profession expanded beyond its separate roots in power and radio. In 1962, the boards and memberships of the two institutes agreed to merge. On January 1, 1963, the IEEE, or Institute of Electrical and Electronic Engineers was born with 150,000 members, 140,000 of whom were in the United States.



®

Total IEEE Membership (1963 - 2013)

as at 31st December 2013



AIEE was organized into technical divisions and committees. The AIEE Power Division was one of them. Initially, the AIEE Power Division chose to stay outside of the new IEEE Group Structure.

The newly formed IEEE organized the technical divisions into units known as Professional Technical Groups or PTGs. In late 1963, PTG – Power was formed and became known as the Power Group headed by a Council-elected chairman.

Professional Technical Group - Power

- Its purpose is to advance the science and practice of electric power generation, transmission, distribution, and utilization. All members of the IEEE are eligible for membership in the group and will receive all Group Publications upon payment of the \$6.00 fee.
- IEEE dues were \$15.00 per year

Professional Technical Group - Power

- Transactions on Power Apparatus and Systems
- Two General meetings per year
- 32 local Chapters
- Council of approx. 70 members, meets once per year, elects officers and members-at-large, approves constitutional amendments, and establishes policy
- AdCom with 15 positions, reports to Council, meets 3 times per year, nominates officers and members-at-large, approves appointments, and approves By-Laws
- Four Departments: Technical Operations, Publications, Meetings, and Organization
- Technical Operations Department with 12 Technical Committees

First Officers of the PTG - Power

- Chairman C. A. Woodrow (GE)
- Vice Chairman R. W. Gillette (Con Ed)
- Secretary T. E. Marburger (BG&E)
- Treasurer J. T. Lusignan (Ohio Brass)
- Past Chairman J. H. Kinghorn (AEP)

Power Engineering Society

- In early 1970, the IEEE Board of Directors (BoD) approved the formation of Societies – beginning with the Power Engineering, Computer, Electronic Controls Societies. The IEEE BoD explained that Societies would allow for the merging of closely related or declining groups and to bring non-IEEE groups into the IEEE.

Power Engineering Society

- The 1971 PES Administrative Committee (AdCom) was headed by a president, vice president, treasurer, secretary, 3 standing committee chairs (Constitution and By-laws, Finance, Nominations and Appointments), 4 department Chairs (Meetings, Organization, Publications, and Technical Operations), and 4 members-at-large.

Past PES Leaders with Affiliations

- 1964-65 C. A. Woodrow (GE)
- 1967-68 L. J. Linde (Allis-Chalmers)
- 1971/72 H. C. Barnes (AEP)
- 1974/75 T.H. Lee (GE)
- 1978/79 H. H. Woodson (UTA)
- 1982/83 L. O. Barthhold (PTI)
- T1986/87 T. W. Hissey (Leeds & Northrup)
- 1990/91 H.N. Scherer (AEP)
- 1994/95 H. E. Weinrich (ABB)
- 1998/99 B. D. Russell (TAMU)
- 2002/03 JW. Estey (S&C)
- 2006/07 J. D. McDonald (KEMA)
- 2010/11 A. C. Rotz (PPL)
- 1965-67 R. W. Gillette (Con Ed)
- 1969/70 W. F. Fee (Northeast Util.)
- 1973 J. B. Owens (I-T-E)
- 1976-77 F. A. Jenkins (Duke Power)
- 1980/81 J. E. Barkle (Westinghouse)
- 1984/85 C. L. Wagner (Westinghouse)
- 1988/89 W. B. Behnke (Com Ed)
- 1992/93 J. W. Pope (Southern Co.)
- 1996/97 R. A. Dent (NYPA)
- 2000/01 D. R. Volka (WEPCO)
- 2004/05 H. B. Püttgen (Georgia Tech)
- 2008/09 W. K. Reder (S&C)
- 2012/13 N. N. Schulz (KSU)

Evolutions

- Transition from camera-ready to fully electronic of Journals
- Presentation before publication
- Decoupling of papers and discussions
- Editorial Boards
- PES Letters
- Existing Transactions Split
- New Transactions
- Direct election of officers
- Globalization/Regionalization
- Creation of Executive Office
- PES Website
- PES Logo
- Advisory Council/focus Groups

PES

- Where are we now?

PES 2014

- The mission of PES is to be the leading provider of scientific and engineering information on electric power and energy for the betterment of society, and the preferred professional development source for our members – Approved by the PES Governing Board, 17 July-2003.
- PES dues (2014): \$35.00 per year
- IEEE dues (2014): \$146 to \$187 based on Region

About PES

- The Power & Energy Society provides the world's largest forum for sharing the latest technological developments in the electric power industry, for developing standards that guide the development and construction of equipment and systems, and for educating members of the industry and the general public.

The PES Governing Board (2014)

- President (Miroslav Begovic)*
- President-Elect (Damir Novosel)*
- Immediate Past President (Noel Schulz)*
- Treasurer (Chris Root)*
- Secretary (Lina Bertling Tjernberg)*
- IEEE Division VII Director (Wanda Reder)*
- IEEE Division VII Director-Elect (odd years only)*
- Seven Vice Presidents*
- Four Regional Representatives
- Four Members-at-Large
- PES Executive Director (Patrick Ryan)*

PES Vice Presidents

- Chapters (Frank Lambert)
- Education (Peter Sauer)
- Meetings (Thomas Mayne)
- Membership and Image (Henry Louie)
- New Initiatives/Outreach (Robin Podmore)
- Publications (Mariesa Crow)
- Technical Activities (Jeffrey Nelson)

PES Regional Representatives

- United States & Canada (IEEE Regions 1-7)
(Mazana Armstrong)
- Europe, Middle East, & Africa (IEEE Region 8)
(Costas Vournas)
- Latin America (IEEE Region 9) (Nelson Segoshi)
- Asia & Pacific (IEEE Region 10) (Lalit Goel)

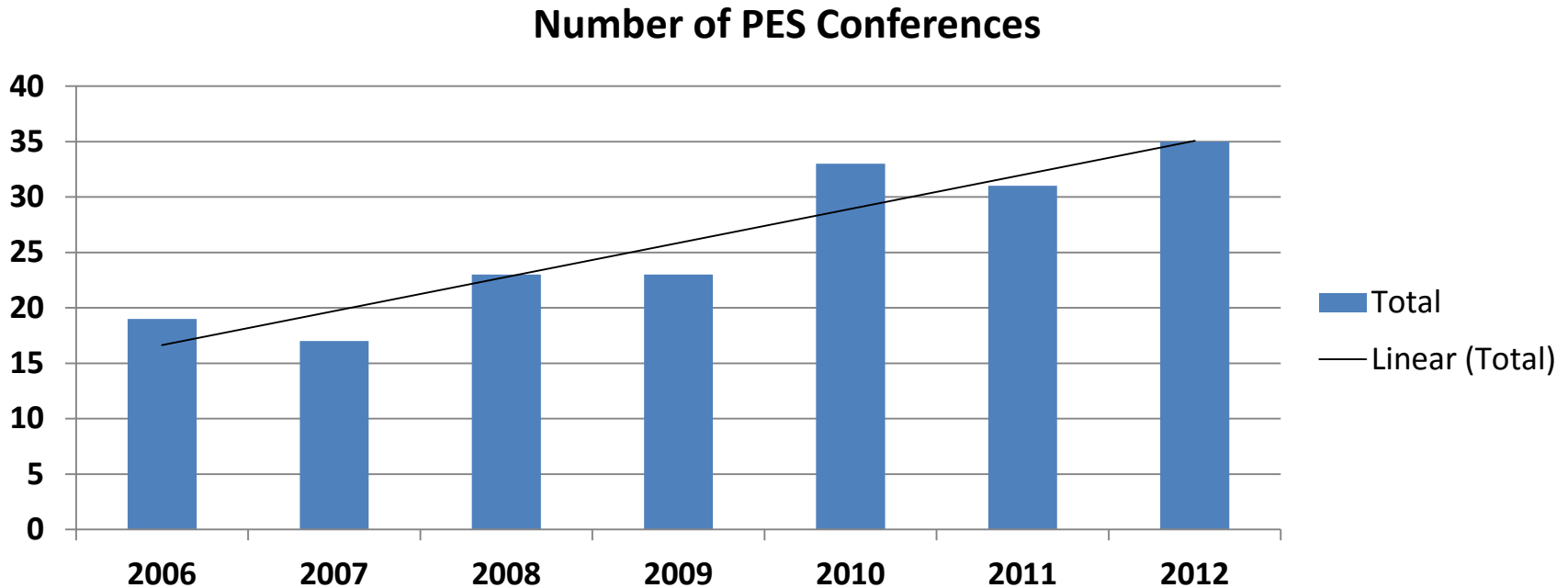
PES Members-at-Large (2014)

- Three MALs have specific* assignments:
 - Standards (Ted Burse)
 - Smart Grid (Erich Gunther)
 - PES Resource Center (Louis “Nando” Ochoa)
 - (Jay Giri)
- * Assignments are made in agreement with the needs of the Society as determined by GovBd

PES Publications (2014)

- IEEE Power & Energy Magazine (free to PES members)
- IEEE Electrification Magazine
- IEEE Transactions on Power Systems
- IEEE Transactions on Power Delivery
- IEEE Transactions on Energy Conversion
- IEEE Transactions on Smart Grid
- IEEE Transactions on Sustainable Energy
- IEEE Power & Energy Letters
- IEEE P&E Technology Systems Journal (open access)
- eNews Update

Number of PES Conferences



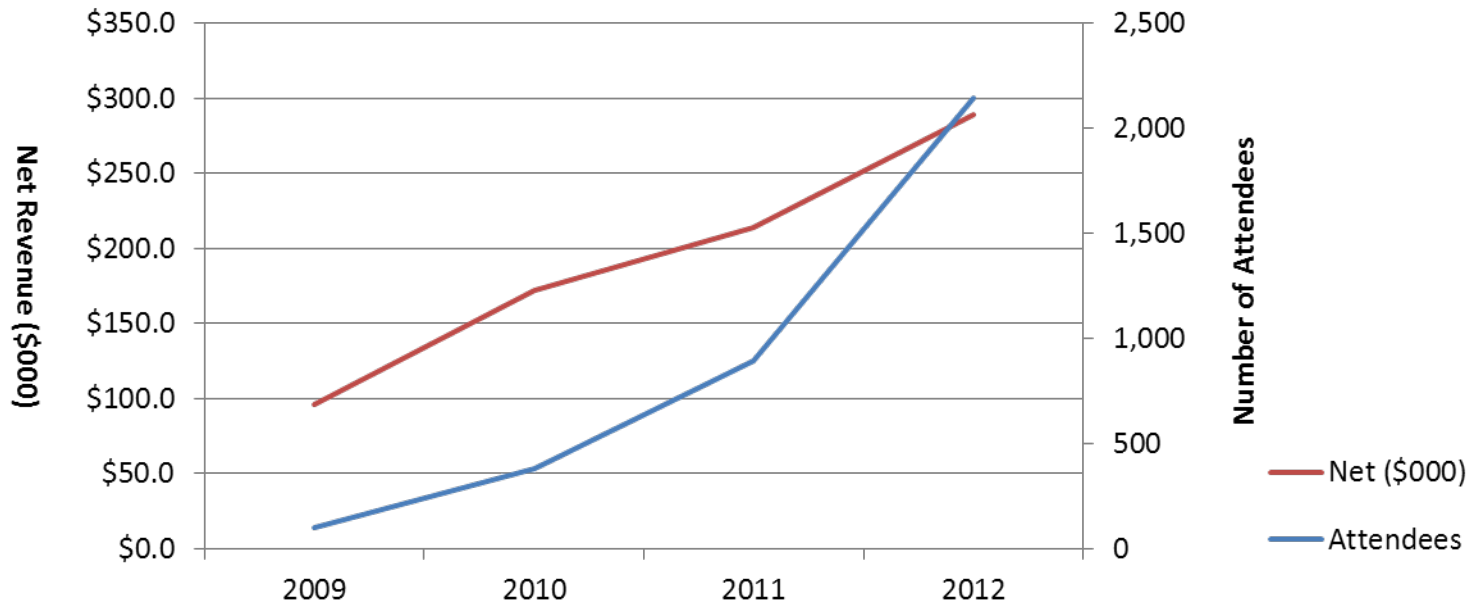
- From 2007 to 2012 the number of PES conferences have grown approximately 100%
- The IEEE processing and reporting requirements have increased for both Financially and Technically sponsored meetings

2015 PES Conferences (sponsored or cosponsored)

1. Joint Technical Committee Meeting, CA, USA
2. IEEE-IEEMA Intelect C&E, Mumbai, India
3. Innovative Smart Grid Technologies, Washington, DC
4. Intl. Electric Machines & Drives, ID USA
5. Transportation Electrification C&E, MI USA
6. Electric Ship Technology Symposium, Washington, DC
7. PowerTech, Eindhoven, Netherlands
8. General Meeting, Denver, CO, USA
9. ISGT Latin America, Montevideo, Uruguay
10. ISGT Europe, Warsaw, Poland
11. ISGT Asia, Bangkok, Thailand
12. Power Africa Conference, Tunis, Tunisia
13. Asia Pacific P&E Engrg. Conference, Brisbane, Australia

Education Services

Education



- Participants reached has grown substantially
- Net has grown well, as well as value to members
- Face-to-face tutorials/Plain Talk has the largest audience currently
- Fast growing Webinars (no distribution tool for charging) and e-Learning
- Videos have great potential, high interest (no distribution tool for charging)

IEEE Standards

- PES is credited with 2,300+ IEEE Standards*
- Areas of coverage include:
 - Batteries
 - Cables
 - Electric Machinery
 - Power System Communications
 - Grounding
 - Instrumentation, Testing & Measurement
 - Protective Relaying
 - Surge Protective Devices
 - Switchgear
 - Transformer

*active, draft, and archived

Standards (cont.)

- There are 536 Power & Energy Standards of the 1254 IEEE Standards (43%).
- There are 230 Power & Energy active PARs of the 548 active IEEE PARs (42%).
- A PAR is a Project Authorization Request.

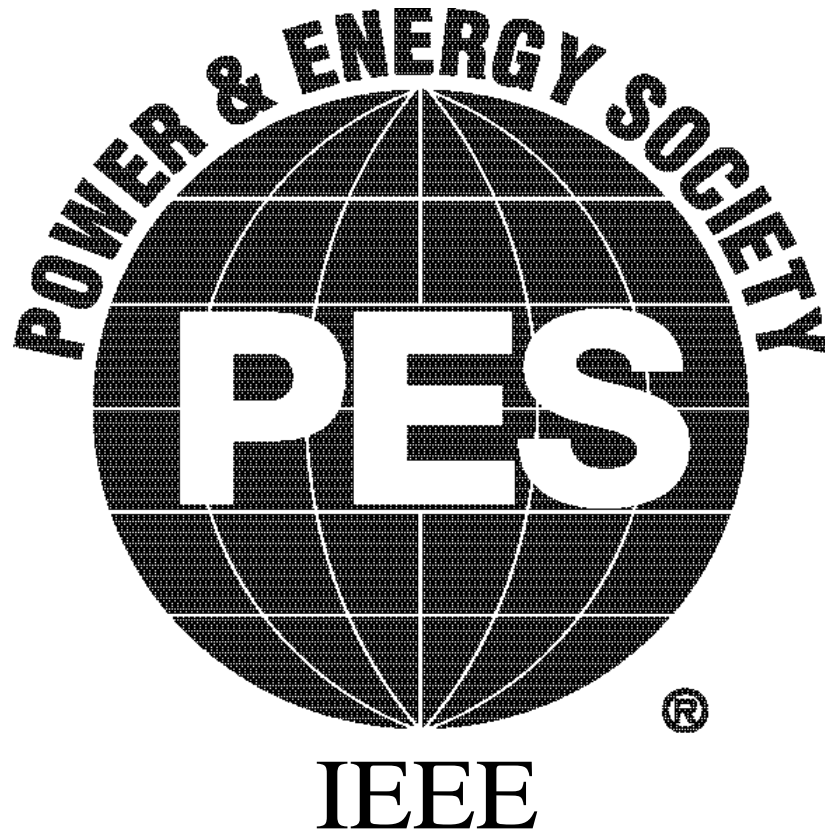
PES Name Change

- In 2008, The Power Engineering Society changed its name to The Power & Energy Society.
- This name change was motivated by the notion that the Power Engineering Society name did not properly describe the scope of interest in which the PES was involved.
- Further, it was determined that a new name would more precisely designate the areas of PES involvement.
- Therefore, the Power& Energy Society name would be more appropriate and attractive to all participants in the industry involved in the electric energy field.

First PES Logo

- In July 1995, PES adopted a logo comprised of a globe with longitudinal and latitudinal lines and the letters PES prominently shown in the center of the globe. Across the top the words POWER ENGINEERING SOCIETY were placed and across the bottom were the letters IEEE.

Interim Logo



The Current PES Logo



Acknowledgments

- *Engineers & Electrons*, Ryder, John D., Fink, Donald G, IEEE Press, 1984
- Sheldon Hochheiser, PhD
IEEE History Center
- Mel Olken
Editor-in-Chief
IEEE Power & Energy Magazine
- Pat Ryan
PES Executive Director

Revisions

- 0: 7-JUL-2014 Original Issue
- 1: 14-JUL-2014 Added Original PES Logo
- 2: 29-JUL-2014 Added Editorial Changes