

Power System Relaying Committee

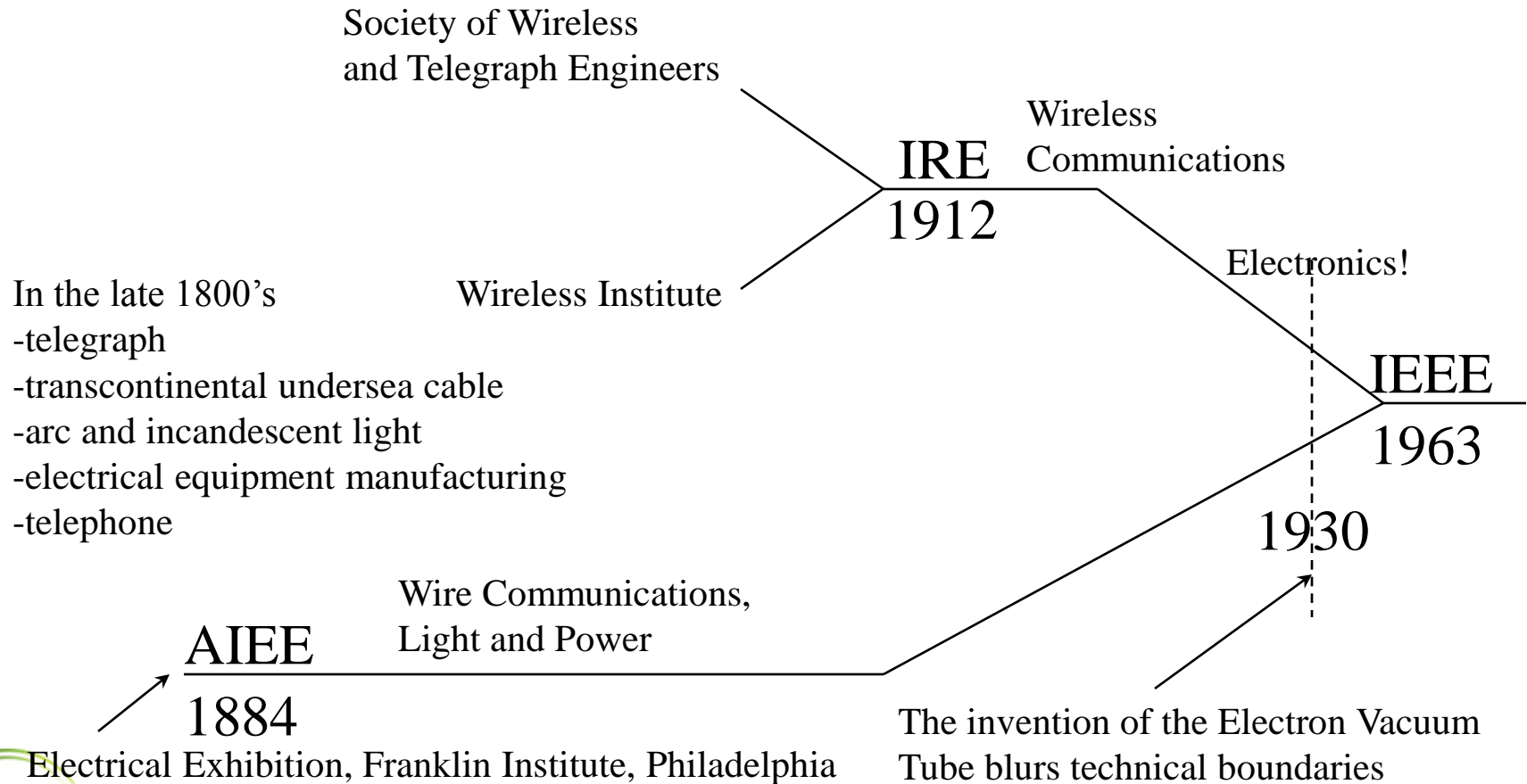
Roger Hedding PSRC Chair

IEEE Roots

- American Institute of Electrical Engineers
- Formed in 1884 at the Electrical exhibition, Franklin Institute, Philadelphia



The IEEE Yesterday



AIEE – American Institute of Electrical Engineers



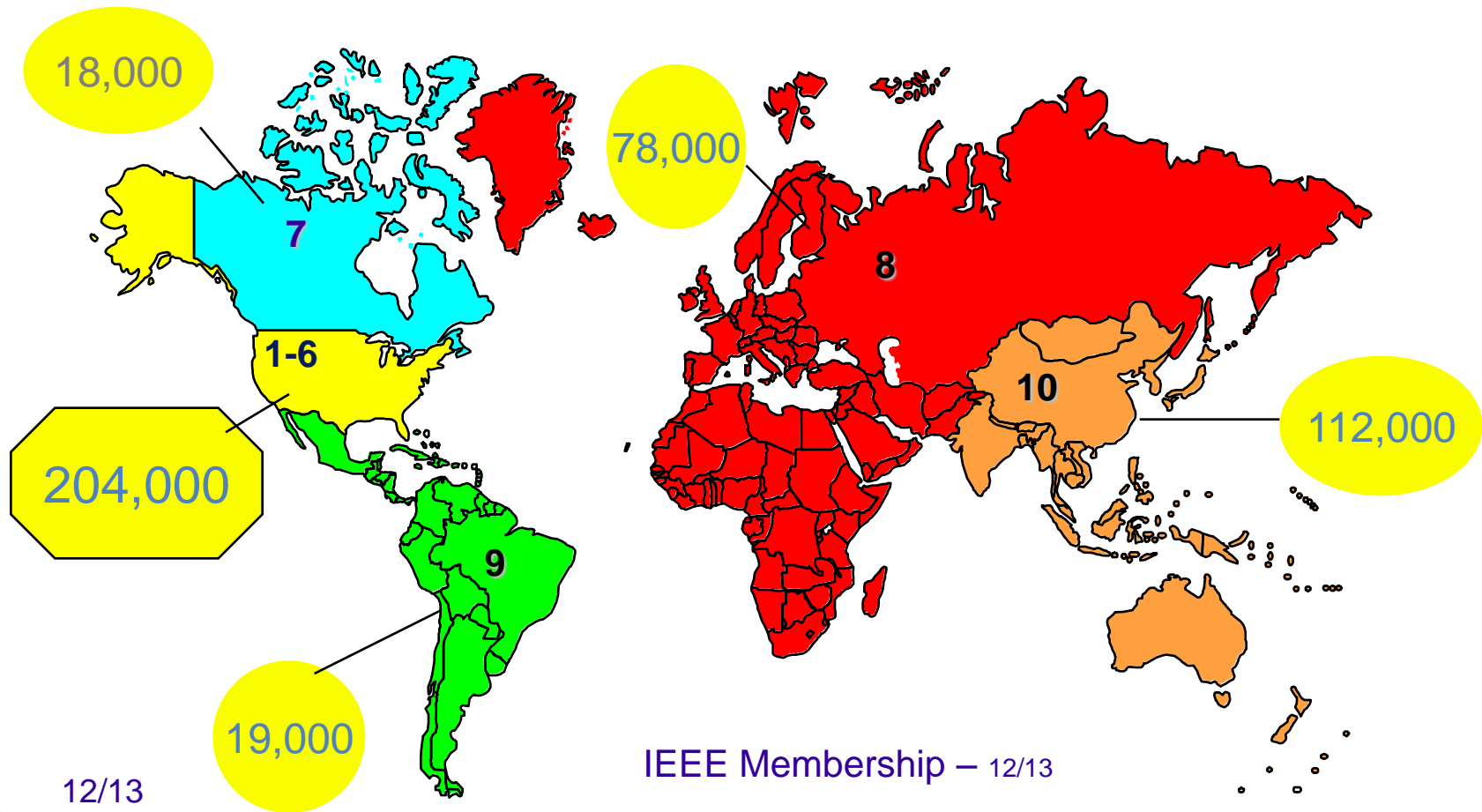
The IEEE Today

- 431,000 members in 160 countries.
- The world's largest technical & professional society.
- 1,400,000 subscribers to all IEEE publications.
- 400,000 attendees at conferences annually.
- 40,000+ participants in Standards.

IEEE Mission & Vision

- Promote technology & allied sciences
- Benefit humanity through electro-technology
- Promote advancement of the profession
- Facilitate networking
- Promote member interests

IEEE Regions & Membership



12/13

IEEE Membership – 12/13

IEEE Organization

The IEEE is made up of

- 38 Societies
- 7 Councils
- Approximately 2,195 individual and joint Society chapters and 333 Sections
- 2,354 Student Branches are located at colleges and universities worldwide.

Power & Energy Society (PES)

- The Power System Relaying Committee is a Technical Committee in the PES
- PES is the third largest Society with 30,479 members
 - Computer society 67k
 - Communications society 50k

IEEE (38 Societies)



Power & Energy Society (PES)
(21 Committees)



Power System Relaying Committee

Power System Relaying Committee

- Meets 3 times a year (Sept., May & Jan.)
- Consists of 6 technical Subcommittees
- Typical attendance 220
 - 50 Utilities
 - 28 Manufacturers
 - 10 Universities
 - 20 Consulting organizations

PSRC Scope

Treatment of all matters in which the dominant factors are the application, design, construction, and operation of protective, regulating, monitoring, synchronism-check, synchronizing, reclosing, and auxiliary relays

PSRC Scope (part 2)

including all matters necessary to the function of such relays and relaying systems employed in the generation, transmission, distribution, and utilization of electrical energy and including the effects of such relays on system operation.

PSRC Scope (Part3)

Treatment of techniques and requirements for communications within, between, and among protective relays, to the extent that these communications affect protection functions or performance

PSRC Scope (Part 4)

Maintenance of liaison and collaboration as required with other committees of the Power & Energy Society and associated Groups and Societies of the IEEE.

PSRC Officers - Main Committee

- Chairman – Roger Hedding - ABB
 - Represent PSRC on Tech Council
 - Sponsor of Standards
- Vice Chairman – Mike McDonald - Ameren
 - Technical Committee Paper Coordinator
 - Chooses new meeting venues
- Secretary – Pratap Mysore - HDR
 - Set meeting agenda
 - Records minutes
 - Runs physical meeting
- Standards Coordinator - Phil Winston – Southern Co.

PSRC Subcommittees

- Advisory
- Systems Protection – Jim O’Brien
- Line Protection – Gary Kobet
- Relay Communications - Eric Udren
- Relay Practices and Consumer Interface
- Jeff Pond
- Rotating Machinery Protection – Murty Yalla
- Substation Protection – Mike Thompson

Advisory Subcommittee

Scope: Assist the Chair of the PSRC on all matters that he may request in the functioning, direction, and conduct of the work of the Main Committee. (Main Committee Officers, Subcommittee Chairs past PSRC Chairs, and B Working Group Chairs)

C System Protection Subcommittee

Scope: Evaluate protection system responses to abnormal power system states. Evaluate and report on special protection schemes, remedial actions schemes, monitoring and control systems and their performance during abnormal power system conditions. Recommend corrective strategies and develop appropriate standards, guides, or special publications. Evaluate and report on new technologies which may have a bearing on protection system performance during abnormal power system conditions.

D Line Protection Subcommittee

Scope: Investigate and report on the relaying techniques and systems used for T&D line protection. Develop statistics and recommend protection practices for improving line relaying performance. Develop and maintain standards for line protection.

H Relay Communications Subcommittee

Scope: Evaluate and report on the characteristics and performance of protective relaying communications. Recommend communication requirements and operating, test procedures which assure reliable performance of the overall protective system. Report on new relaying equipment designs tailored to specific communication requirements.

I Relaying Practices Subcommittee

Scope: Develop, recommend and establish standards on protective relaying practices which are compatible with the electrical environment, including, but not limited to, relay withstand capabilities to electromagnetic interference, characteristics and performance of instrument transformers, testing procedures, applications, performance criteria, and definitions of relays and relay systems.

J Rotating Machinery Subcommittee

Scope: Evaluate and report on protective relaying concepts and practices applicable to generators, motors, synchronous condensers, associated auxiliary systems, and performance of plant protective systems. Develop and maintain related relaying standards.

K Substation Protection Subcommittee

Scope: Evaluate and report on methods used in protective relaying of substations and the consumer or independent power producer, associated equipment and performance of these protective systems. Develop and maintain relaying standards which relate to this equipment and the utility-consumer interface.

What does PSRC Do ?

- Responsible for 45+ IEEE Standards and Guides
 - Standards have 10 year life
 - Before the 10 years expires the standard must be updated and balloted
 - After a successful ballot standard is good for another 10 years
- Technical paper review
- Write reports / papers

Update Standard Process

- 5 year process
- Task force formed
 - Review standard
 - Recommend to subcommittee whether to
 - Withdraw because no longer pertinent
 - Form a working group and request Project Authorization Request (PAR) from IEEE –SA

Project Authorization Request

- Valid for 5 years
- Allows IEEE SA to track progress on work
- Allows other Technical committees to know about standard, comment and/or jointly sponsor if partially in their scope
- Standard must be updated and balloted before PAR expires

Working Group Process

- Education
 - Speakers present topics pertinent to standard
 - Working group member learn about topic
 - One reason to join working group
- Writing or rewriting
 - Members write various portions of standard
 - Writing assignments are reviewed and revised
- Balloting
 - Ballot and resolve comments
 - 75% approval needed
 - Anyone can join balloting body
 - Just be an IEEE SA member
- Forward to IEEE SA for final approval and publishing

Working Group Process

- After Ballot is finished working group assignment is complete
- Working group may publish
 - Transaction paper
 - Conference paper
 - Tutorial

Working group for Reports

- Often times subject is too new for a standard
- Write a Report to Main Committee or Subcommittee
- Path similar to path taken for standard except
 - No PAR
 - No 5 year completion date
 - Ballot process less formal
 - Done by consensus
- Can be reopened at a later date to create Standard

WHAT HAS PSRC DONE RECENTLY ?

C System Protection Subcommittee

- C2 Role of Protective Relaying in the Smart Grid
- C4 Guide for Phasor Data Concentrator Requirements for Power systems Protection Control, and Monitoring
- C14 The Use of Time Synchronized Measurements in Protective Relay Applications
- C17 Fault Contributions from wind plants

D Line Protection Subcommittee

- D6 AC Transmission Line parameter model verification
- D19 Guide for Protective Relay Applications to Transmission lines
- D25 Distance element response to Distorted waveforms
- D27 Guide for the Application of Digital Line Current Differential Protective relays Using Digital Communications

H Relay Communications Subcommittee

- H1 Guide for Protective Relay Applications over digital communications channel
- H11 Standard for Synchrophasors for power systems
- H12 Configuring Ethernet Communications equipment for substation protection and control
- H13 Understanding requirements and applications of Substation Cyber Security Standards (joint with SUB C10)

I Relaying Practices Subcommittee

- I7 Revision of guide for differential and polarizing circuit testing
- I11 Guide for Application of Optical Current Transformers for Protective Relaying
- I12 Quality Assurance for Protection and Control
- I21 End of Use Assessment for P&C Devices

J Rotating Machinery Subcommittee

- J2 Protection considerations for Combustion Gas Turbine Starting
- J5 Application of Out of Step Protection Schemes for Generators
- J7 Avoiding Unwanted Reclosing on Rotating Apparatus
- J8 Improved Generator Ground Fault Protection

K Substation Protection Subcommittee

- K1 Guide for the application of protection to phase shifting transformers
- K5 Guide for Breaker Failure Protection
- K6 Sudden Pressure Protection for Transformers
- K11 open Phase Detection for Nuclear Generating plants

Where do new task force ideas originate ?

- Standard within 5 years of expiring
- Subcommittee Members
- Outside sources

Outside Source example

- One of the findings from 2003 Northeastern blackout was that some relays operated below setpoint at reduced voltage and frequency.
- NERC SPC Subcommittee wrote letter to PSRC requesting we investigate.
- D22 Formed
- Report “Performance Specification and Testing of Transmission line relays for Frequency Response”

Membership

- Anyone can come and participate
- Guest
- Working Group member
- Subcommittee member
- Main Committee member

What does the future hold for PSRC ?

- Established over 75 years ago
- Relays were just single function electromechanical devices
- Relays are now multifunction devices with DFR, SCADA, RTU, and Communication capabilities
- Lots of overlap with other technical committees

Future

- PES Tech Council task force investigating Committee assignments in light of new technologies
- Will make recommendations for organization next year

PSRC Proposal

- Treatment of all matters in relating to the application, design, construction and operation of protective, regulating, monitoring, reclosing, synch-check, synchronizing and auxiliary relays, **plus matters relating to the data acquisition, processing and control systems within substations.** Including matters necessary to the functioning of relays and relaying systems employed in transmission, generation, distribution and utilization of electrical energy and their effect on system operation. **Control systems include transducers, Intelligent Electronic Devices (IEDs), Human Machine Interfaces (HMIs), and communication networks. These matters include the low-level interfaces to and protocols communicating locally and remotely with these systems. Cyber security and the environmental phenomena that can adversely affect these systems are included.** Maintenance of liaison and collaboration as required with other committees of PES and associated groups of IEEE.

Next Meeting

- May 12- 15, 2014
- Fort Lauderdale, FL
- All are welcome
- Won't you come ?
- Website : www.pes-psrc.org

Meeting Organization

- Monday evening reception
- Tuesday – all day working group meetings
- Wednesday morning – working group meetings
- Wednesday afternoon – Subcommittee Mtgs
- Thursday - Main Committee Meeting

QUESTIONS ?