

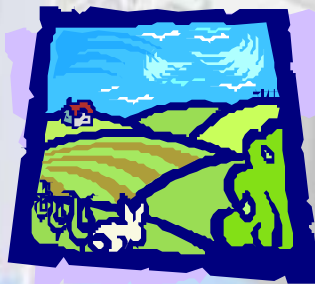
# IEEE/PES Transformers Committee

[www.transformerscommittee.org](http://www.transformerscommittee.org)

## Newcomers Orientation

March 14, 2005

Welcome to Jackson !



## 7:00 AM – Why So Early??



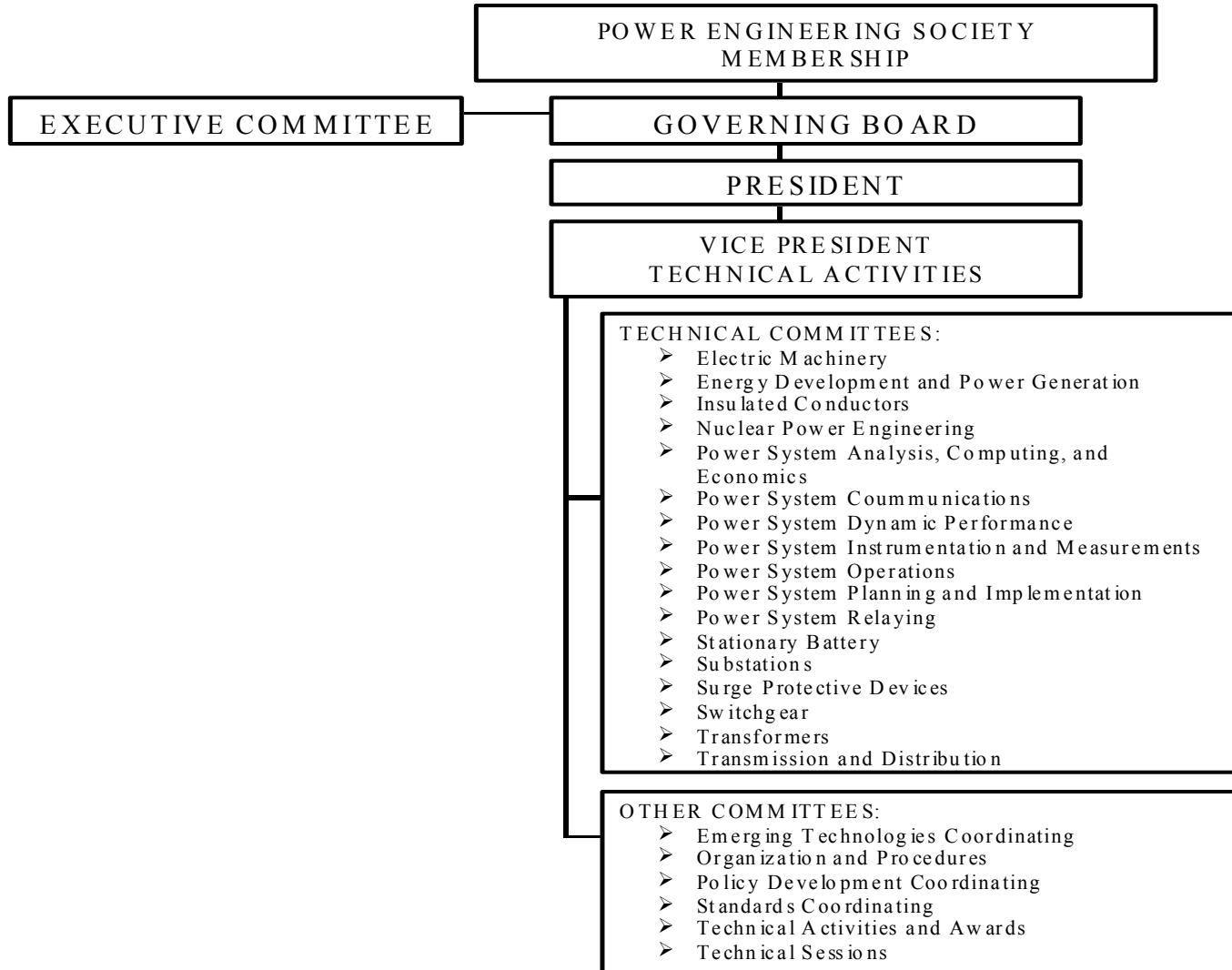
- Look at the schedule - there's a lot going on here
- New Attendees find it useful – suggestions welcome
- Thanks for coming! Let's get started

# Newcomers Orientation - Agenda

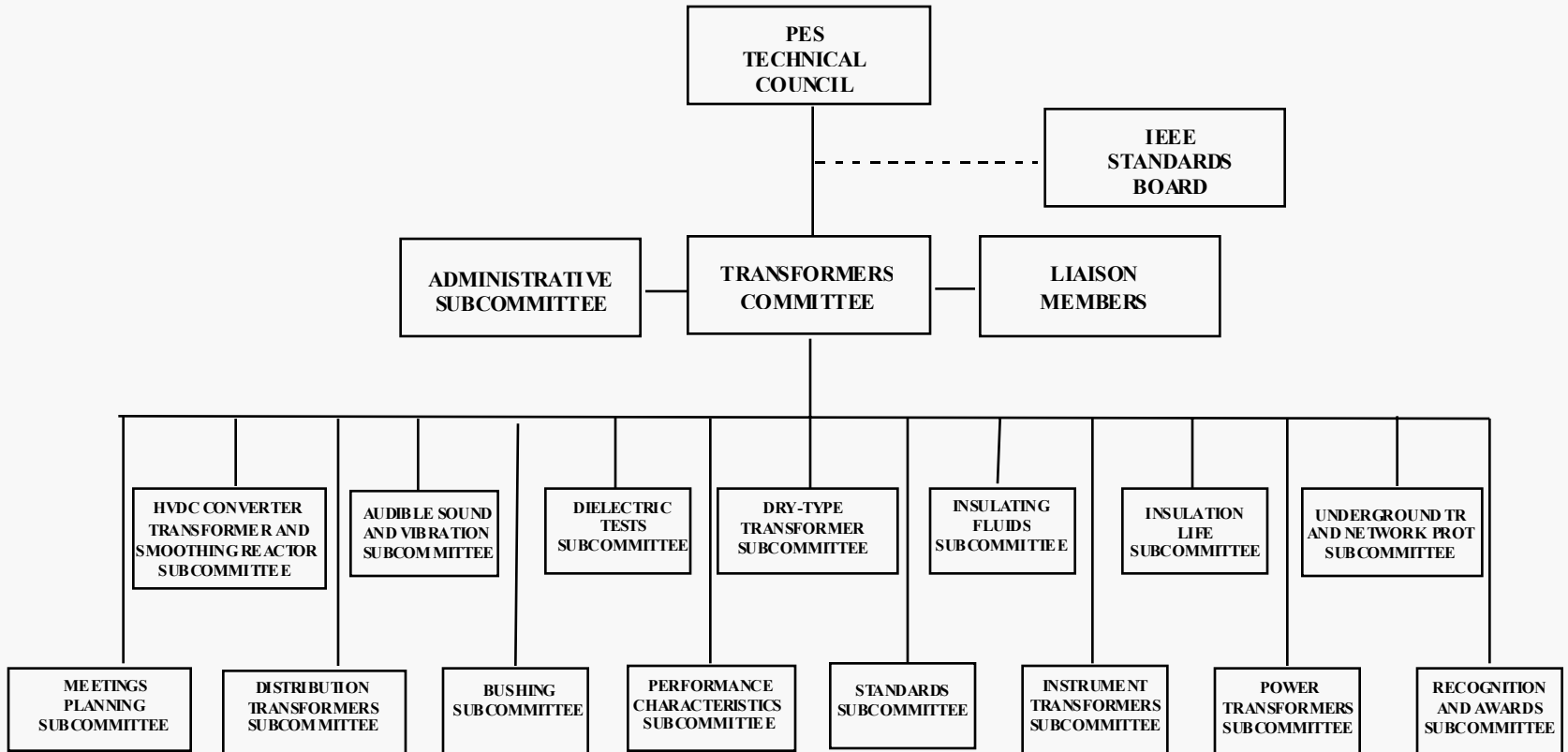
- Who are we?
- What do we do?
- What can YOU do?
- Balloting Process
- Key Projects for Technical Subcommittees



# Who are we?



# Who are we?



# Officers of the Committee

## Chairman

**Kenneth S. Hanus, TXU Electric Delivery, 2525 W. Story Road, Fort Worth, Irving, TX 75038 U.S.A.**

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## Past-Chairman

**H. Jin Sim, Waukesha Electric Systems, P.O. Box 268 Goldsboro, NC 27530 U.S.A.**

**Phone (919) 580-3234 Fax (919) 580-3236 Email: [jin.sim@ieee.org](mailto:jin.sim@ieee.org)**

## Standards Coordinator

**Bill Chiu, Southern California Edison, 501 S. Marengo Ave., Bldg. C, Alhambra, CA 91801 U.S.A.**

**Phone: +1 (626) 308-6086 Fax: +1 (626) 308-6930 E-Mail: [bill.chiu@ieee.org](mailto:bill.chiu@ieee.org)**

# What do we do?



**Treat all matters in which the dominant factors are the application, design, construction, testing and operation of transformers, reactors and other similar equipment. Included is treatment of the following:**

- **Generator Step-Up, Transmission and Distribution Transformers**
- **Voltage Regulators (step and induction regulators)**
- **Reactors and Grounding Transformers**
- **HVDC Converter Transformers and Smoothing Reactors**
- **Power Semi-Conductor Rectifier Transformers**
- **Instrument Transformers (voltage transformers and current transformers)**
- **Insulation and Dielectric Problems Relating to Transformers**
- **Apparatus Bushings**
- **Insulating Fluids**
- **Underground Transformers and Network Protectors**
- **Phase Angle Regulating Transformers**

# Check out the Committee Website: [www.transformerscommittee.org](http://www.transformerscommittee.org)

**WEB**  
44212  
Visitors From September 1999

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[Subcommittees](#)  
[Standards](#)  
HOSTED BY:

**IEEE/PES TRANSFORMERS COMMITTEE**

**WELCOME**

THE TOP TITLE BAR IS ACTIVE, IT MAY BE USED TO GO TO IEEE/PES OR TO RETURN TO THIS PAGE FROM ANYWHERE WITHIN THIS WEB SITE.

**Next Meeting: Las Vegas, NV October 24 - 28, 2004 - Hosted by: Don & Wilma Cash**

**SPECIAL NOTICES**

All information for the [next meeting](#) is now posted on the Next Meeting page. The on-line registration system is now closed. Please register at the meeting. Complete Meeting Information Packet: 959kB

Minutes for the Spring 2004 Meeting (San Diego) are now fully assembled and posted. Updated 10/15/04

**ASSOCIATION MANAGEMENT SYSTEM**

We are now using a new web-based system which is REVOLUTIONIZING how we communicate within the Committee, and administrate our membership and meeting attendance records. This new system is now the Committee's PRIMARY MODE OF COMMUNICATION. Anyone (even non-members) can join this system! We encourage you to sign-up and participate!

Learn more: [New AM System!](#)

**COMMITTEE INFORMATION**

[Executive Officers](#) [Voting Members](#)  
[Committee Scope](#) [Eligibility](#)  
[Organization](#) [Revision of Membership](#)

**SUBCOMMITTEES**

[SC Org Chart](#)  
Checked box indicates Minutes from the San Diego meeting are available.

(1 item remaining) Downloading picture [http://www.transformerscommittee.org/meetings/S2004\\_SanDiego/Photos/Bay-2r.JPG...](http://www.transformerscommittee.org/meetings/S2004_SanDiego/Photos/Bay-2r.JPG...)

Start | D:\Documents and Settin... | Microsoft PowerPoint - [F... | Transformers Commit... | 2:55 AM

# What do we do?

- **Sponsor and develop (either alone or jointly with other technical committees and/organizations) standards, recommended practices, guidelines and policies as well as preparation of position papers and/or documents, technical conferences**
- **Liaison and cooperation with other technical committees, societies, groups and associations concerned with various aspects of items listed in the scope of the Committee – including promoting harmonization with international standards organizations such as IEC**
- **Continuing education for our attendees through Tutorial presentations on current state of the art in the industry, on new issues requiring attention in Standards documents, and on significant work in the Committee.**
- **Reviewing technical papers in areas covered by the Committee scope, and encouraging members and participants to advance the knowledge of the industry by writing and publishing technical papers**
- **Technical Subcommittee activities are outlined in the Key Projects later**

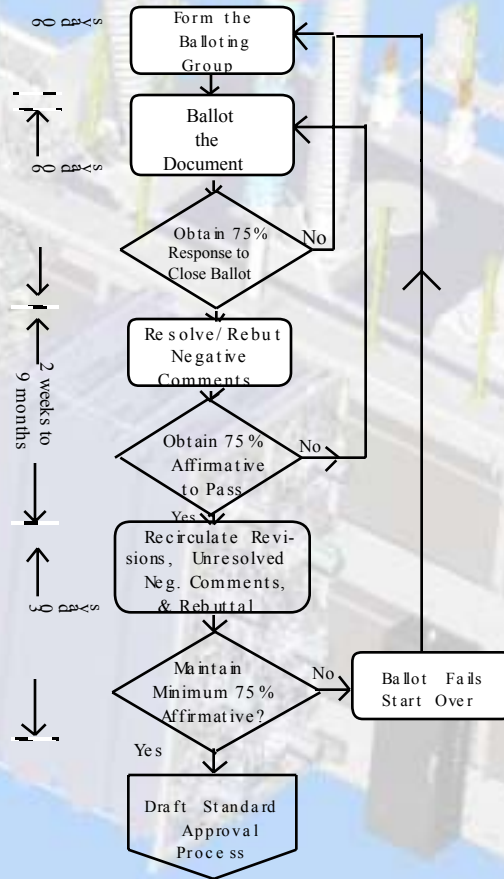
# What can YOU do?



- **Join the activities that you are interested in**
  - **Working Groups / Task Forces / Subcommittees**
- **Participate in these activities by volunteering for work**
  - **Write drafts**
  - **Review what others write**
  - **Provide comments and discuss issues**
- **Join Standards Association and participate in balloting process**  
(<http://standards.ieee.org/db/balloting/ballotform.html>)
- **Work together with a group of dedicated professionals to serve our industry**

# Sponsor Balloting

Ballot Draft Chart



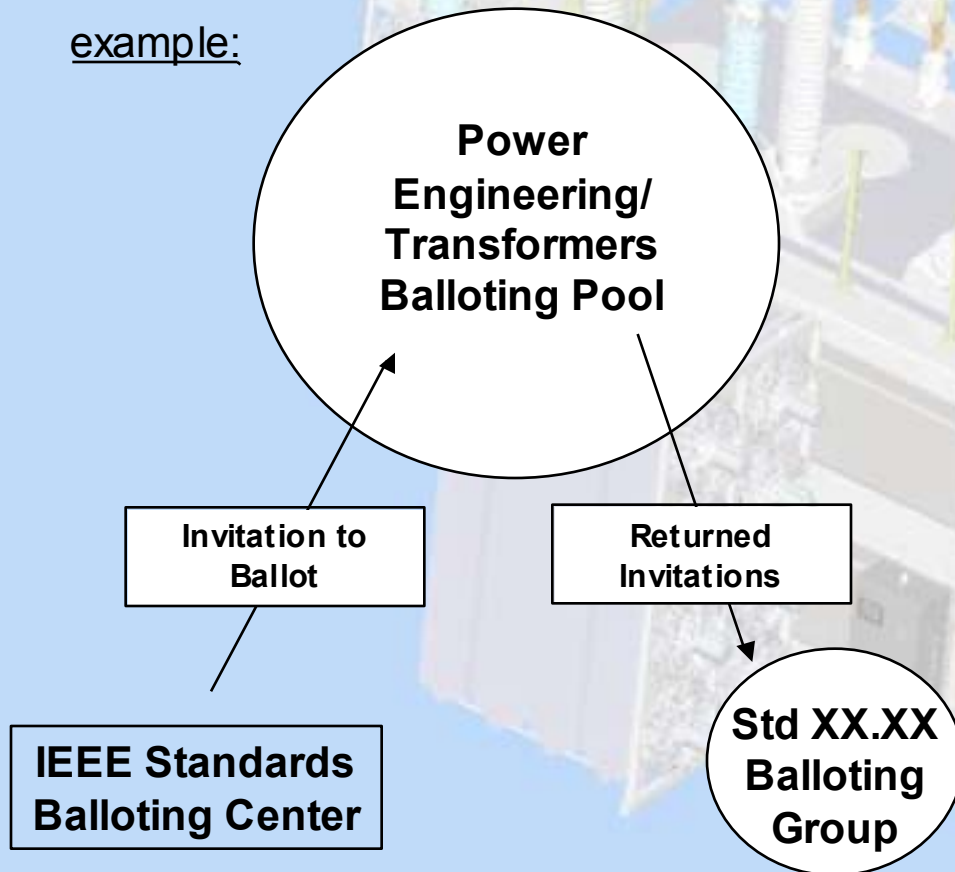
# The Invitation-to-Ballot Process

- The IEEE Standards Sponsor issues a call to begin formation of the *Balloting Group* when a specific IEEE standards project nears the Sponsor Ballot stage
- The Invitation-to-Ballot form is sent out via E-mail to all appropriate persons comprising the Balloting Pool for that discipline
- If a party is interested in participating in the Sponsor Ballot, the person simply fills out and returns the On-line Invitation-to-Ballot form to the IEEE Standards Balloting Center
  - Those responding comprise the Balloting Group

# The Invitation-to-Ballot Process

(cont.)

example:



**Invitations to Ballot** are sent out to the appropriate set of persons comprising the *Balloting Pool* for that discipline. Those who respond comprise the *Balloting Group* for that specific standards project.

**Balloting is all done electronically.**

# What can YOU do?

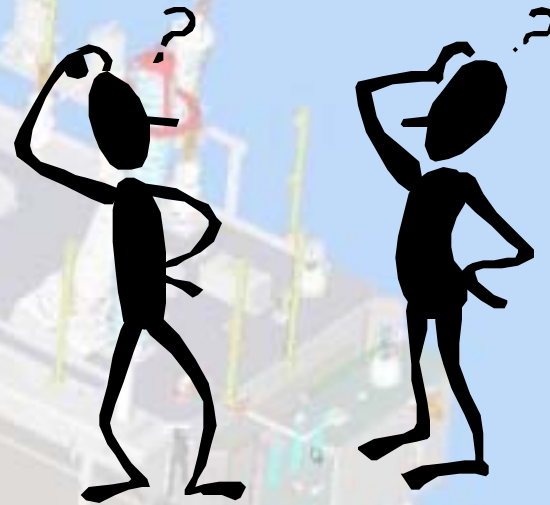
- **Learn**

- **Industry trends**
- **Issues that impact your work**
- **Solutions to those issues**

- **Practice / Implement**

- **What you learn**
- **Simplify / Standardize**

- **Build a strong NETWORK of industry experts - and good friends too!**



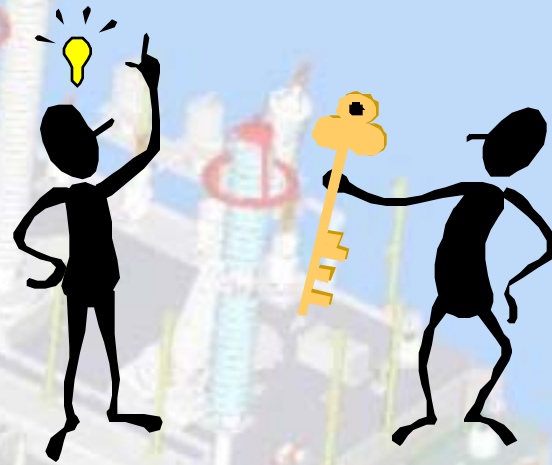
# What can YOU do?

- **Technical Papers**

- **Write them**
- **Review them**
- **Attend presentations**

- **Tutorials, Symposiums, Special Technical Sessions**

- **Present your developmental work to your peers**
- **Learn and apply to your day to day work**



# Key Projects for Technical Subcommittees

Audible Sound and Vibration – Jeewan Puri

**Study and review engineering aspects of the requirements and methods of measurement (testing) of matters relating to audible sound and vibration of products within the scope of the Committee.**

- **A TF has finished developing Sound Intensity Measurement procedures for inclusion in section 13 of the test codes IEEE C57.12.90 and C57.12.91**
- **A TF is developing Standard Sound Levels for Liquid Filled and Dry Type Transformers to fill the gap where these levels do not exist for certain kVA ranges or exist in obsolete standards.**

# Key Projects for Technical Subcommittees

Bushings – Fred Elliott

**Study and review engineering aspects of apparatus bushings having BIL of 110kV or above and used as components of power transformers, reactors and oil circuit breakers.**

## **Maintains the Following Standards:**

- **C57.19.00 – IEEE Standard General Requirements and Test Procedures for Outdoor Power Apparatus Bushings**
- **C57.19.01 – IEEE Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings**
- **C57.19.03 – IEEE Standard Requirements, Terminology, and Test Code for Bushings for DC Applications**
- **C57.19.100 – IEEE Guide for Application of Power Apparatus Bushings**

# Key Projects for Technical Subcommittees

## Dielectric Test – Loren Wagenaar

**Study and review engineering aspects of test voltage requirements for service conditions, or conversely, voltage tests that will determine that service requirements are met for liquid filled transformers and reactors.**

- **WG on revision of Low Frequency Dielectric Tests covered by standards C57.12.00 & C57.12.90**
  - **Temperature correction factors for power factor tests**
  - **New TF on revision of Electrical PD Guide, C57.113**
- **WG on Liquid-Immersed Transformer Dielectric Test Tables**
  - **Simplify tables and make them more understandable**
- **WG on Acoustic PD tests**
  - **PC57.127, Guide for Detection and Location of Acoustic Emissions from PD in Oil-Immersed Power Transformers and Reactors - Update of existing guide to add location aspect**
- **WG on revision of Impulse Tests covered by standards C57.12.00 & C57.12.90**
  - **Proposal regarding minimum impulse generator energy level during test when 50% tail time is shorter than 40 microseconds**
- **WG on revision of Impulse Test Guide, C57.98**
  - **Complete update to add digital measurement techniques, testing with internal arresters, other impulse test methods**

# Key Projects for Technical Subcommittees

Distribution Transformers – Ed Smith

**Study and review engineering aspects of overhead, pad mounted, unit substation and certain underground type distribution transformers. Evaluation to include enclosure integrity and surface coatings.**

- **Revise and update existing standards on Distribution Transformers, Distribution Substation Transformers, and Voltage Regulators**
- **Completed balloting on C57.12.34 – Three Phase Padmount Transformers (document based on combination of C57.12.22 & C57.12.26) – Metrification Issue**
- **Begin work to combine C57.12.21 & C57.12.25 – Single Phase Padmount Transformers (Livefront and Deadfront)**
- **Guide for DT Loss Evaluation C57.12.33 - finishing up on balloting process**
- **Joint WG's with other technical committee (C37) to update and develop "Enclosure Integrity" standards now under the TC umbrella**
- **Responsible for 13 Guides and Standards**

# Key Projects for Technical Subcommittees

Dry Type Transformers – Chuck Johnson

**Study and review engineering aspects of those transformers and reactors in which a significant component of the internal insulation is air or other insulating gas.**

- **Main Standard Documents**

- **C57.12.01 Requirement standard for Dry type transformers – Completed ballot and submitted for printing**

- **C57.12.91 Test Code for Dry type transformers – various changes in progress**

- **C57.12.56 & 60 - WG on Thermal Evaluation of Insulation Systems for Power & Distribution Xfmrs. – Work to begin to merge both standards.**

- **TF on Dry Type Reactors**

- **Annex on Thyristor-Controlled Reactors (C57.21)**

- **Revision of the parts of C57.21 relating to dry type reactors and addressing negative ballots from reaffirmation of C57.21**

# Key Projects for Technical Subcommittees

## HVDC Converter Transformers & Smoothing Reactors – Richard Dudley

**Study and review engineering aspects of the requirements, design, testing and installation of HVDC converter transformers and smoothing reactors.**

- **This group is responsible for two documents**
  - **IEEE 1277-2000 Smoothing Reactors for HVDC application (Dry and Liquid-Immersed)**
  - **IEEE C57.129-1999 Converter Transformers for HVDC application**
- **Both standards are due for revision in 2005 & 2004 respectively**
- **Focus of this group is on obtaining feedback resulting from the use of these standards on HVDC projects from manufacturers and users**
- **Provide input on the revision of the standard covering DC bushings**
- **Evaluate standards requirements for emerging technologies such as voltage source converters as applied to HVDC**

# Key Projects for Technical Subcommittees

Instrument Transformers – Jim Smith

**Study and review the engineering aspects of instrument current transformers and inductively coupled instrument voltage transformers.**

- **Current documents balloted by IEEE:**
  - **C57.13.5 - Test Requirements for High Voltage Instrument Transformers 115 kV Nominal System Voltage and above**
  - **C57.13.6 - Instrument Transformers for use with Electronic Meters and Relays**
- **Current documents under revision:**
  - **C57.13 - Requirements for Instrument Transformers**
  - **C57.13.2 – Conformance Test Procedure for Instrument Transformers**

# Key Projects for Technical Subcommittees

Insulating Fluids – Frank Gryszkiewicz

**Study and review the engineering aspects of electrical insulating fluid properties for use in transformers and other electrical apparatus. Consider matters pertaining to acceptance maintenance and handling of such fluids. Determine the effect of various treatments, aging in service, gas evolution and other phenomena on the fluids' properties and determine the criteria for serviceability of the equipment.**

**•C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers**

- Wide acceptance and usage to interpret DGA results
- Recirculation ballot in final stages

**•C57.106 – Guide for Acceptance and Maintenance of Insulating Oil in Equipment**

- Approved by the IEEE Standards Board in June 2002 and printed in November 2002. Review of Tables 4 & 5 based on negative ballots.

**•C57.130 – Trial Use Guide for the Use of Dissolved Gas Analysis During Factory Thermal Tests for the Evaluation of Oil Immersed Transformers and Reactors**

- Draft 14 is presently being balloted

**•C57.139 – IEEE Guide for Dissolved Gas Analysis of Load Tap Changers**

# Key Projects for Technical Subcommittees

Insulation Life – Don Platts

**Study and review methods to determine maximum safe insulation temperatures, ambient temperatures, insulation aging characteristics, safe duration of loads in excess of nameplate (including short circuits) and also to determine methods of calculating or measuring temperatures reached during both transient and steady state loads.**

- **Major rewrite of the loading guide, C57.91**
- **TF on winding temperature indicators - Writing a technical paper (and possible tutorial) on the problems with making accurate winding measurements**
- **TF on temperature rise clause 5 in C57.12.00 - formed to make a recommendation to the Insulation Life SC concerning changes to this clause**
- **New projects being considered**
  - **Summarize experience with the overload heat run test**
  - **Standardize procedures for calculations of heat run data**

# Key Projects for Technical Subcommittees

Meetings Planning - Greg Anderson

## **Administrative Responsibility for Planning and Managing Committee Meetings**

**The Subcommittee will promote the scope of the Committee by providing pleasant and productive meeting events.**

### **•On-going duties include:**

- Locating, soliciting, educating, and assisting local meeting hosts**
  - Supervising the negotiation and signing of hotel and vendor contracts**
  - Maintaining on-going Committee funds (treasurer duties)**
  - Overseeing individual meeting budgets & expenditures**
  - Developing each detailed meeting schedule**
  - Coordinating educational tutorial sessions and presentations to the Committee**
  - Coordinate with related organizations and industry events to reduce conflicts in event schedules**
- WG on Web-site Development -- maintains the Committee's web-site ([www.transformerscommittee.org](http://www.transformerscommittee.org))**

# Key Projects for Technical Subcommittees

Performance Characteristics – Ramsis Girgis

**Study and review the treatment of loss, impedance, exciting current, inrush current and other performance characteristics and their methods of application, measurement or test for liquid filled transformers and reactors.**

- **Loss Measurement Guide finalized**
- **Switching Transient Induced by Transformer/Breaker Interaction, PC57.142**
  - **Coordination with IEC, CIGRE, and other IEEE Committee (C37)**
- **Frequency Response Analysis (FRA) testing WG set up to develop standard or guide – liaison with Power Transformers SC**
- **New PCS related issues on two main documents (C57.12.00 and C57.12.90)**

# Key Projects for Technical Subcommittees

Power Transformers – Tom Lundquist

**Study and review engineering aspects of liquid filled power transformers, including transmission transformers, primary unit substation transformers, generator step-up transformers, phase angle regulating transformers and related products.**

- **Revision of C57.12.10 (Product Standard for Power Transformers)**

- Will cover all kVA and Voltage ratings
- Will cover LTC application for Delta or Wye, HV or LV
- Will cover new monitoring and control devices (electronic gauges and meters)

- **Revision of C57.131 (Standard Performance Requirements for LTC)**

- Will define the LTC Contact Life

- **Working Group for Control Cabinet Guide - guide for layout, functionality and construction of control cabinets for power transformers**

- **WG Evaluation and Reconditioning of Liquid Immersed Transformers**

- **C57.93 (Power Transformer Installation Guide) will work on field processing, shipping, and general revision of the guide**

- **DETC WG - Tap Changer for De-Energized Operation Specification and Test**

- Coordination with IEC 60214

# Key Projects for Technical Subcommittees

Standards – Bill Chiu

**Coordinate revision work of base standards by maintaining a list of requested changes and assigning them to the appropriate Technical Subcommittees. Coordinate inputs into a complete and logical document for submission to the Standards Board**

- **Continuous Revision of the following main standards (Every 2-3 years)**
  - **C57.12.00, General Req. for Liquid Immersed Distb., Power & Reg. Xfmrs.**
  - **C57.12.90, Std. Test Code for Liq. Immers. Distb., Power & Reg. Xfmrs.**
  - **C57.12.80, Standard Terminology for Power and Distribution Transformers**
  - **C62.91 (IEEE 32), Rev. to Req. and Tests for Neutral Grounding**
- **Transformers Committee, as a whole, develops new standards and maintain the existing ones.**
  - **70 documents (standards, recommended practices, and guides) are maintained by us. These need to be reviewed by industry experts to determine if they reflect “state of the art” at least every five years.**
  - **22 Active projects. 11 are revising existing documents, 11 are developing new documents.**



# Key Projects for Technical Subcommittees

## Underground Transformers and Network Protectors – Carl Niemann

**Study and review the engineering aspects of secondary network protectors and secondary network transformers (liquid filled and dry-type) and three phase underground type distribution transformers.**

- **Working on Revision of the following documents**
  - **C57.12.24, Underground type Three Phase Distribution Transformers**
  - **C57.12.40, Secondary Network Transformers, Subway and Vault types**
  - **C57.12.44, Secondary Network Protectors**
  - **C57.12.57, Ventilated Dry-Type Network Transformers**



# What's in it for me? – PES President John Estey's message on PES membership

## FOR THE PARTICIPANT

- Attend and participate in world-class meetings
- Participate in the Standards Development process
- Learn from the experts during technical sessions and tutorials
- Share your experience and knowledge
- Access to Committee and PES web-based information
- Stay up-to-date with technological advances

## FOR THE EMPLOYER

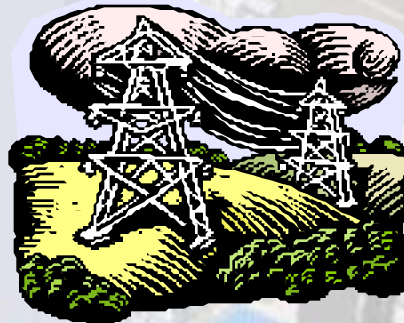
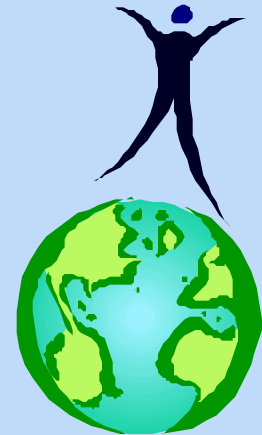
- Cost effective access to the latest information on transformer technology
- Opportunity to significantly influence industry standards through employee participation in standards development
- Provide employees with top-notch ongoing training through tutorials and technical sessions
- Contribute to employees professional development and morale
- Access to Industry trends, problems, solutions, contacts

**Welcome Aboard!!!**

**We're Glad You're Here !**

**Make some new friends, and...**

**Let's Get to Work !**



**Questions / Comments?**