MINUTES OF THE IEEE/PES

TRANSFORMER COMMITTEE

APRIL 4, 1984

VANCOUVER, BRITISH COLUMBIA

MINUTES OF THE IEEE/PES
TRANSFORMERS COMMITTEE
APRIL 4, 1984
VANCOUVER, BRITISH COLUMBIA

Members or Representatives Present - 69

L. J. Savio, Chairman
D. A. Yannucci, Vice Chairman
O. R. Compton, Secretary

Allan, D. J.
Allen, B. F.
Allustiarti, R.
Alton, R. J.
Arjeski, E. H.
Bergeron, J. J.
Borst, J. D.
Brutt, F. J.
Cash, D. J.
Chitwood, E.
Cook, Sr., F. W.
Corkran, J.
Dutton, J. C.
Ebert, J. A.
Evans, C. E.
Farber, W. R.
Fischer, H. G.
Forster, J. A.
Frydman, M.
Gabel, Jr., H. E.
Gilles, D. A.
Goldman, A. W.
Grifford, W. F.
Grubb, R. L.
Gunnels, G.
Hall, G.
Harlow, J. H.
Hawkins, T. K.
Highton, K. R.
Hoefler, P. J.
Huber, Jr., F.
Hurty, C.
Iliff, G. W.
Jacobsen, R. G.
Kappeler, C. P. rep by
L. D. Miller
Keller, O.
Kelly, J. J.
Lampe, W.
Light, H. F.
Lipscomb, T. E.
Little, R.
Long, L. W.
Matthews, J. W.
McCormick, L. S.
McGill, J. W.
McMillen, C. J.
McNutt, W. J.
McCrae, G. G.
Mehta, S. P.
Miller, C. K.
Millian, C.
Mutschler, W.
Norton, E. T.
Pearce, H. A.
Perco, D.
Roach, D. A.
Smith, L. R.
Stein, W. W.
Stensland, L. R.
Thomason, F. W.
Traub, T. P.
Uptegraff, Jr., R. E.
Veitch, R. A.
Wagenaar, L. B.
Whearty, R. J.
Wrenn, W. E.
Wurdack, A. C.

Members Absent - 47

Aicher, L. C.
Antalis, S. J.
Arnold, J. C.
Bancroft, R.
Bellaschi, P. L.
Bennon, S.
Bonucchi, J.
Bowers, G. H.
Buchanan, D. F.
Chartier, E. E.
Crofts, D. W.
Daniels, M. G.
Degeneff, R. C.
Douglas, D. H.
Douglass, J. D.
Easley, J. K.
Edwards, E. C.
Falkowski, P. P.
Foster, S. L.
Gardam, C. H.
Heinrichs, F. W.
Herrera, J. J.
Honey, C. C.
Jauch, E. T.
Johnson, D. C.
Kieren, R. C.
Kline, A. D.
Lowe, R. I.
Manning, M. L.
Margolis, H. B.
Melton, N. J.
Minkwitz, Sr., R. E.
Mitchell, C. E.
Moore, H. R.
Moser, H. P.
Musil, R. J.
Olsson, R. A.
Schmid, R. L.
Smith, B. E.
Stetson, R. B.
Stockum, F. R.
Tanton, A. L.
Thomas, R. C.
Thompson, J. A.
Truax, D. E.
Walton, J. W.
Wilks, A.

Guests - 38

Benko, S. I.
Bergman, W. J.
Binder, Jr., W. B.
Bryant, G.
Crichton, C.
Doughty, K. W.
Germain, J. P.
Goodavish, J. F.
Heath, D.
Henning, W.
Hoesel, C. R.
Hollister, R. H.
Iijima, P.
Kennedy, W. N.
Klein, S. J.
Koenig, E.
Lackey, J. G.
Lee, R. E.
Miller, L. D.
Mitelman, M. I.
Moon, J. L.
Nay, J. J.
Nicholas, L.
Northrup, S. D.
Oklu, S. K.
Owen, R.
Perkins, W. B.
Pollitt, J. M.
Poulin, B.
Reitter, G. J.
Robbins, C. A.
Schafer, D. R.
Shenoy, V.
Strangas, E. G.
Thenappan, V.
Vaillancourt, G.
Yasuda, E. J.
Yung, C. S.

MINUTES OF MEETING
IEEE/PES TRANSFORMERS COMMITTEE
VANCOUVER, BRITISH COLUMBIA, CANADA
APRIL 4, 1984

1.0 Chairman's Remarks and Announcements

Chairman Savio convened the meeting at 8:00 a.m. with 69 members or their representatives and 38 guests present. Appreciation was expressed to George McCrae and his colleagues at B. C. Hydro and the Vancouver IEEE Chapter for a job well done. Registration was reported as 178 including 30 ladies. All attendees made self introduction.

1.1 Awards

Mr. William J. McNutt was presented the Committee's Distinguished Member Award.

2.0 Approval of Minutes of the Dearborn Michigan November 9, 1984 Meeting

The minutes of the captioned meeting were approved as corrected. The corrections were:

1. Change "ASNI" to "ANSI" on page 2 of Appendix 1A.

2. Inclusion of missing pages for Appendix 1E, Report of the Dielectric Subcommittee. (The complete Appendix 1E is included in these minutes as Appendix 1EA. ORC).

3.0 Report of Administrative Subcommittee - L. J. Savio
Appendix 1A

3.1 Future Meetings

	Date	Hotel
Boston	October 15-17, 1984	Park Plaza
St. Louis	April 14-17, 1985	Stouffer's Riverfront
Toronto	October 27-30, 1985	Delta Chelsea Inn
Little Rock	April 6-9, 1986	Excelsior
Pittsburgh	October 12-15, 1986	William Penn
Fort Lauderdale	Spring 1987	
New Orleans	Fall 1987 November 1 thru 4	Monteleone

4.0 Report of PES Standards Coordinating Committee - D. A. Yannucci
Appendix 1A, Exhibit I

5.0 Subcommittee Reports

			Appendix
Audible Noise and Vibration	-	L. A. Swenson	1C
Bushings	-	L. B. Wagenaar	1D
Dielectric Tests	-	L. S. McCormack	1E, 1EA
Dry Type Transformers	-	B. F. Allen	1F
Instrument Transformers	-	R. C. Thomas	1G

Insulation Life	-	C. J. McMillan	1H
Insulating Fluids	-	H. A.Pearce	1I
Performance Characteristics	-	J. D. Borst	1J
Recognition and Awards	-	W. J. McNutt	1K
Transformer Standards	-	L. R. Smith	1A, Exhibit III
West Coast	-	R. Little	1N

6.0 Liaison Report

7.0 Technical Papers - D. A. Yannucci 1M

8.0 Membership

Present membership stands at 119 (including 3 new members below). Three new members were recognized. They were:

D. Shefka - Brown Boveria Electric
W. R. Henning - RTE Corporation
E. J. Yasuda - Bonneville Power Administration

9.0 New Business

Chairman Savio briefly discussed the possibility of developing an Ad Hoc Users Group for committee members with the computer programs in the area of transformers.

Mr. Dutton advised that he is finding increasing use of K. (Kelvin) (without the degree superscript) when referring to delta temperatures or temperature rises.

Chairman Savio determined that only a small number of members have copies of the organization and procedures manual for the committee. He reported that it would be revised and reissued.

Respectfully submitted,

Olin Compton
Secretary to the Committee

APPENDIX 1A

ADMINISTRATIVE SUBCOMMITTEE

The Administrative Subcommittee met at 6:00 PM on Sunday, April 1, 1984 with the following members and guests present:

B. F. Allen
O. R. Compton
J. C. Dutton
R. Little
L. S. McCormick
J. D. Borst
C. J. McMillen
W. J. McNutt
H. A. Pearce
L. R. Smith
L. B. Wagenaar
D. A. Yannucci

1. Introductions were made.

2. Minutes of the Detroit meeting were approved.

3. The Standards Coordinating Committee Activities report is attached. Exhibit I.

4. Technical Council Activities were reported on by Mr. Yannucci and the report and discussion are attached. Exhibit II.

5. Mr. L. R. Smith's report on Standards Project Status is attached. Exhibit III.

   5a. Mr. Smith will coordinate the revisions to C57.12.00.

   5b. It was moved, seconded and approved that the Task Force that developed P784 be disbanded.

6. Mr. Dutton's report on C57 Standard Status is attached. Exhibit IV.

7. Mr. B. Allen will be stepping down as Chairman of the Dry Type Transformer Subcommittee. Our thanks to Ben for his years of dedicated service to the Committee.

8. Liaison Representation - No discussion.

9. Power Group Meetings - See Committee Report.

10. No new information was added to future meetings.

11. The following were accepted into the Committee as members:

Dave Shefka	-	Brown Boveri Electric
W. R. Henning	-	RTE Corporation
E. J. Yasuda	-	Bonneville Power Administration

12. The secretary has attendance records which indicate a number of inactive members who have changed jobs or retired. Absenteeism was discussed and it was decided the secretary would send a letter to absentees.

13. A suggestion to revise the standards balloting procedure was discussed in the subcommittee and it was decided to table the suggestion.

14. Meeting adjourned.

Leo J. Savio
June 5, 1984

EXHIBIT I

REPORT OF PES STANDARDS CO-ORDINATING COMMITTEE ACTIVITIES

D. A. Yannucci

The Standards Co-ordinating Committee met on Monday, January 30, 1984. Mr. E. J. Yasuda advised that, due to the resignation of Mr. P. W. Bogner, SPD Chairman, he is currently the SPD Chairman, pro term. Mr. R. D. Ball who was present has assumed the duties of the SPD Standards Co-ordinator.

Discussion arose on the problem with continuity of liaison representation from other societies, such as IAS. Since many standard's projects continue for a number of years, it is possible that liaison representatives may resign or retire during this time. Experience has shown that these individuals, nor the society they represent, advises the sponsoring committee of the change. It was agreed that the responsibility of maintaining liaison remains with the liaison representative and/or the society that he represents. It was also noted that the Standards Co-ordinators should contact Paul Lange at the IEEE Standards Office for any questions concerning the status of liaison with other societies.

Bert Stanleigh of IEEE Standards advised that he and Sava Sherr are trying to get authorization for additional people in order to reduce the backlog of standards awaiting publication.

Concern was expressed about co-ordinators who do not respond to the SPAR requests during the allotted time period. It was agreed that the 30 day time period may be tight but in the interest of keeping the project active it probably should be continued. Should a request for co-ordination be received at a reasonable time after this period, it could still be accepted and the appropriate parties notified.

Another item of discussion involves the appointment of representatives to ANSI and other standards-related organizations. Once the means of the proposed representatives are submitted, there is no feed-back mechanism to advise the individual that he has been accepted. Fred Huber of IEEE Standards will investigate and advise.

Bert Stanleigh stated that more information on the transition of American National Standards Committees will be forthcoming this quarter of 1984.

John Bauer of NPEC reported on the results of a questionnaire on electrical noise. A summary of the results will be prepared and distributed to the SCC members.

The next meeting will take place during the 1984 Summer Power Meeting in Seattle.

Since mid-September, 1984 A total of 15 requests for co-ordination were reviewed. Of these co-ordination have been established with:

1. P 381 IEEE Standard for Qualification of Class 1E Modules for Nuclear Power Stations. - Len Stensland

2. PXXX Application Guide for sure protection of Electric Generating Plants. - G. W. Iliff

In addition project request processed are:

1. Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers. - B. Allen

0321E

EXHIBIT II

PES COUNCIL MEETING

Two tutorials had been scheduled for the 1984 winter meeting, power plant noise and transformers. The transformer tutorial was well organized and there were 27 advanced registrants. The power plant noise tutorial was cancelled, however, due to lack of interest.

John Anderson, Chairman of the PES, announced his retirement. Mel Olicen is assuming the chairmanship of PES. Mr. Anderson made recommendations on the reorganization of the Technical Council. He indicated that the TC should be organized such that its output which is, which is largely in the form of paper, does not run counter to its structure. Also, those committees with common interests should work more closely together for the common good. The Technical Council is the one common meeting ground presently available where all the technical committees gather together to discuss mutual problems and ideas, but as presently organized, the TC is too unwieldly to accomplish much in two Monday night meetings a year. Most of the actual work has to be done behind the scenes, and about all these Monday TC meetings accomplish is to alert committees to various activities and problems and to reach a consensus on whether those behind-the-scenes activities are compatible with each committee's interests. Thus, it is not so much the biannual Monday night meetings that need to be reorganized - rahter, it is how the behind-the-scenes work should be organized to make it more visible and effective.

Much of the behind-the-scenes work (not specifically concerned with a particular technical committee or with publications) is supposed to involve our Long Range Planning Task Force. However, the LRPTF did not meet in 1983, and suffers from a lack of membership and too many ill-defined goals and uncertainties. It is recommended that it be abolished, and replaced with

several smaller Task Force organizations with clearly defined goals and specific deadlines or benchmarks. These teams should report directly to the TC chairman, and their members drawn from the ADCOM's of all the technical committees. This reorganization also deserves a #1 priority. The Task Forces names and objectives are:

1. TASK FORCE ON FUTURE TECHNICAL DEVELOPMENTS
   a. Sponsor one general session at each Summer and Winter Power Meeting on the technologies and equipments we need rather than what we presently have. Present selected slide and paper-supported arguments on what is needed in, for example, new relays, new ways of undergrounding transmission, modular substations, amorphous metal transformers, fusion, solar boltaics, new instruments for analyzing the state of power systems, use of parallel-processing computers, fiber optic communications, etc.
   b. Advise the Technical Council on how it should organize to support the development of new technology and the development of new products.

2. TASK FORCE ON ENERGY TECHNOLOGY AND UTILIZATION
   The goals for this task force were best outlined by Russ Allen in a recent letter. In a paraphrased form they include:
   a. Handle all those matters of energy policy that are relevant to the operation of the Power Engineering Society and the advancement of its members, including position statements.
   b. Identify energy alternatives that are practical and realizable and their true risks and benefits. Define these alternatives.
   c. Sponsor computer applications to energy technology and pursue computer scenarios involving various energy options and their ultimate benefit.
   d. Explore design and operational problems in combined central/dispersed generation power sources and how systems need to be modified to use dispersed generation.

I call to your attention that the IEEE Energy Committee already has the following subcommittees:

Nuclear Fuel Cycle Subcommittee
Educational Subcommittee
Fusion Subcommittee
Cogeneration Subcommittee
Renewable Resources Subcommittee
Communications Subcommittee

and how they are in the process of forming a Fossil Fuels Subcommittee. If the Technical Council technical committees do not take a more active part in energy questions, the above list can expand into a new IEEE Society.

3. TASK FORCE ON TECHNICAL COUNCIL PROCEDURES AND ORGANIZATION

a. Keep Technical Council procedural guide updated and distributed to all committee chairmen.
b. Propose procedures to streamline TC administration and review processes.
c. Evaluate and propose solutions to the Technical Council for all conflicts in scope or overlaps in committee activities.
d. Examine the basic structure of the Council and its technical committees and make proposals to the council for restructuring of any and all its technologies in the most effective way.
e. Measure the effectiveness of our various operations and report these measures to the TC chairman.

4. TASK FORCE ON YOUNG ENGINEERS

Young engineers hold in their hands the future of the Power Engineering Society as much - or more - as do its senior members. It is vital that young engineers be brought into PES technical activities, otherwise there will soon not be a PES. This Task Force has as its responsibilities:

a. Devise and implement TC procedures that bring more young engineers (students and graduates) into technical committee activities.

b. Sponsor student papers and prizes each year.

c. Provide TC advisors to student projects (retired PES members would be a good pool of advisory talent, and hopefully much could be done by correspondence).

d. Integrate young graduate and undergraduate engineers into TC technical committee working groups.

e. Act as the TC interface with the Chapters Council.

5. TECHNICAL SESSIONS IMPROVEMENT TASK FORCE

This activity is presently being carried out by the Technical Sessions Improvement Committee, but, in function and membership, that committee acts as a task force and probably should be so labeled. It needs to have its membership increased and its function broadened to explore innovative approaches to our delivery of descriptions of technical accomplishments to our membership. The Power Engineering Society functions somewhat like a "technical middleman". We take "products" - which are the fruits of the intellectual labors of a large group of electrical technologists, engineers and scientists and deliver these "products" into the minds of our members and into their archival storage for future reference. We presently do this with paper via speakers who occasionally have difficulty speaking English. In this age of computers, video display terminals, transportable disks and tapes, show-and-tell displays and teleconferences, it is readily apparent that we have not changed without measure. Something is wrong (or at least incomplete) with how we handle our "product."

a. Evaluate and implement improvements in our present technical session procedures.

b. Monitor and measure performance by chairmen, speakers and supporting staff at the technical sessions.

c. Innovate new approaches to delivery of our "product" to our membership.

6. PUBLICATIONS EDITORIAL BOARDS

When we reach a consensus on our new publications policy, we will have to set up the machinery to carry out that policy. If our publications are to be split into several journals covering various areas of power engineering technology, then each publication must be tended by representatives from the various TC technical committees concerned with that area of technology. I suggest that this could best be done by forming editorial boards from the active members of the TC publications committee. These editorial boards would convene at scheduled intervals as the full TC Publications Committee to review and take action on matters common to all our publications, such as publications policy. They would work closely with the PES Publications Department.

Another major issue is Publications. It is urgent that we adopt and implement a new publications policy in 1984. The formation of our TC Publications Committee has been an important step in this direction and this committee is moving steadily toward a revised policy that all the technical committees and the general membership can accept. They need Technical Committee support and your constructive ideas toward a revised publications policy that better serves the profession. This should be our #1 priority for 1984.

The proposed publication policy being recommended by the Technical Council Publications Committee chaired by Mel Olicen. In summary, the proposal is as follows:

1. The PA&S Transactions will no longer be the exclusive vehicle for publication of accepted papers. All accepted papers will be published in archival conference records. The Transactions will contain only the best judged papers of those presented (limited to perhaps 10%) and would also include other selected papers and articles. Transactions would no longer be limited to PES publications but may also include high quality work from other IEEE as well as non-IEEE sources. An editorial board will be responsible for the selection of all Transactions material.

2. Paper review will be conducted as it is presently and in the same time frame. The review will be on an accept/reject basis; however, an attempt will be made to give the reviewer additional guidance.

3. Publication of accepted papers will be in "Conference Records" which will be available subsequent to the meeting, complete with discussions and closures. Preprints will continue to be available, prior to and at the meeting.

4. The Conference Record will be published in 3 volumes. Tentatively, the technical committee division will be as follows:
   a. Systems - (Power System Engineering).
   b. Generation/Equipment - (NPEC, Power Generation, Rotating Machinery, Power System Instrumentation and Measurements.
   c. Power Delivery - Insulated Conductors, T&D, Substations, Power System Communications, Power System Relaying Switchgear, Surge Protective Devices, Transformers).

5. The papers published in each Conference Record will be grouped by sponsoring technical committee. Each Conference Record will contain an index (or perhaps abstracts) of those papers contained in the companion records.

6. The Editorial Board for selection of Transactions material will be under the aegis of the Publications Department and will consist of 2 representatives each from Systems, Generation/Equipment and Power Delivery plus the Vice Chairman of the Technical Council and its own chairman, who will be appointed by the Publications Department. This 8 person board will receive recommendations of papers from the technical committees via their group representatives and will also be responsible for the selection of non PES material for Transactions.

7. The Power Engineering Review would continue to be published monthly and contain the summaries of all accepted papers. Transactions, which would become considerably smaller in content than it is presently, could be published less frequently, perhaps quarterly.

After consulting with the Transformer Committee officers, D.A. Yannucci wrote a letter dated 1/27/84 to M. Olicen stating our concerns. It stated a concern that the editorial board will have enough expertise to judge which papers are indeed transaction quality. There is a strong feeling that significant input from the individual respective committees are required. There is also concern that if outside papers are accepted they may preclude a society paper, and who is to say that the outside paper is more worthy of acceptance than one sponsored by a committee.

At the ADCOM meeting, a motion was approved to formalize our concerns and transmit them to M. Olicen.

APPENDIX IL
EXHIBIT III

REPORT
OF
THE STANDARDS SUBCOMMITTEE
IEEE TRANSFORMER COMMITTEE MEETING
VANCOUVER, B.C.
APRIL 2-4, 1984

All subcommittees reported up-to-date status of their projects except the Audible Sound and Vibration.

My records have the subcommittee chairmen as listed below:

B. F. Allen	Dry-Type Transformers
J. D. Borst	Performance Characteristics
R. E. Liebich	Audible Sound and Vibration
R. M. Little	West Coast
L. S. McCormick	Dielectric Tests
C. J. McMillen	Insulation Life
H. A. Pearce	Insulating Fluids
L. R. Smith	Standards
R. C. Thomas	Instrument Transformers
Loren Waggenar	Bushing

The following is a summary of the activities and status of the various subcommittee projects as reported through October 31, 1983.

Project Status

PC57.12.00 - General Requirement for Liquid Immersed Distribution Power and Regulating Transformers

PC57.12.00 Table 6B - Revision of Dielectric Test Requirements for Distribution Transformers. This document is being balloted in the Transformer Committee.

C57.12.00, Section 5, and C57.12.90, Section 10 - Dielectric Tests for Transformers. Draft #4 is being balloted in the Transformer Committee.

PC57.12.01 - General Requirements for Dry-Type Distribution and Power Transformers

Development of specific change related to solid resin encapsulated coils is continuing.

PC57.18.10 - Semi-Conductor Rectifier Transformer

A draft has been prepared for review.

PC57.21 - American National Standard Requirements, Terminology and Test Code for Shunt Reactors

This project is being discussed at the Task Force Level.

PC57.93 - Guide for Installation of Liquid Immersed Power Transformers

Work started at the March 8, 1983 meeting of the West Coast Subcommittee. Next work expected spring of 1984.

PC57.95 - Loading Guide for Regulators

Approved by IEEE Standards Board March 22, 1984. Now at Standards Editor.

PC57.96 - Guide for Loading Dry-Type Distribution and Power Transformers

Draft #3 of the proposed revision has been distributed to the Working Group for review and comments.

C57.102 - IEEE Guide for Acceptance and Maintenance of Transformer Askarel in Equipment

PAR sent back for revision. This project has been renumbered. Was P76. No progress reported.

PC57.104 - Guide for the Detection and Determination of Generated Gases in Oil Immersed Transformers and their Relation to the Serviceability of the Equipment

Survey questionnaire being circulated.

PC57.110 - Harmonic Load Current Heating of Transformers

Draft #4 is being balloted in the Transformer Committee with returns due April 15, 1984.

PC57.111 - Guide for Acceptance and Maintenance of Silicone Liquid in Equipment

Draft #4 ballot out to Subcommittee.

P21 - Revision of ANSI C76.1

Draft #4 is being balloted in the Subcommittee.

P24 - Revision of ANSI C76.2

Should be published in late March 1984.

P65 - Thermal Evaluation of Ventilated Dry-Type Power and Distribution Transformers

C57 approved for submission to ANSI BSR with BSR review scheduled for April 1984.

P76 - This project was renumbered to C57.102.

P93 - Transformer Impulse Tests (C57.98)

Publication being expedited.

P262E - Revision of C57.12.90 Loss Tolerance and Measurement

P262E/D5 - Proposed addition to C57.12.90, Section 9.2.4.2. Corrections to Load Loss Measurements. Nine negative ballots in Transformer Committee. Changes have been proposed and will be circulated for Working Group review.

P262E.1/D3 - Proposed revision of C57.12.90, Sections 8.1 and 8.2.2 (new). No load loss temperature correction. Still on hold pending verification of correction method.

P262E.2/D6 - Proposed addition to C57.12.90, Section 8.3.2.1 and deletion of Section 8.3.3. Voltmeter connection for no-load loss measurement. Being balloted in the Transformer Committee with returns due 1/31/84.

C57.12.90; 8.2.1 Assumed to be still waiting additional data.

P345 - Review of IEEE Std. 345-1972 Test Procedures for Thermal Evaluation of Oil Immersed Distribution Transformers (C57.100-1974)

Passed by Standards Board. Sent to C57 March 23, 1984.

P462C - Revision of C57.12.00, Section 5.9, Loss Tolerance and Measurements

Still on hold pending resolution of correction method under P262E.1/D3.

P462D - Revision of C57.12.00, Section 9.1. Wording of Ratio Tolerance.

Draft #4 being balloted in the Transformer Committee with returns due 3/23/84.

P513 - Seismic Guide for Power Transformers and Reactors

Balloting completed. Final document ready for transmittal to IEEE Standards Board.

P545 - Recommended Practice for Partial Discharge (Corona) Tests for Transformers

Still being discussed in working group.

P546 - Revision of ANSI Requirements for Instrument Transformers C57.13-1978.

Meeting of subcommittee March 20-21, 1984. Finalized Wording. Draft #1 being readied for submittal to Transformer Committee for ballot.

P637 - Proposed Guide for the Reclamation of Insulating Oil and the Criteria for Its Use

In Editorial Staff. Proofs in Subcommittees hands by May 1984.

P638 - Standard for Type Tests on Class 1E Transformers for Nuclear Power Generating Stations

Revision D13 issued for ballot to the NPEC/SC-2 Subcommittee in January 1984.

P670 - Switchgear and Transformers Working Group on Instrument Transformers for High-Voltage Circuit Breakers

No activity reported (see end of report).

P731 - Revision of Guide for Loading Current Limiting Reactors, ANSI C57.99

Still no volunteer for Task Force Chairman but now have a good prospect.

P732 - Revision of Current Limiting Reactor Standards, ANSI C57.16

Last report was in March 1980 when D. A. Duckett resigned and a new chairman was being sought. Jack McGill has now accepted this job.

P745 - Guide for Conducting a Transient Analysis for Dry-Type Transformers (C57.XX)

Draft #5 is being balloted in Transformer Committee.

P756 - Guide for Loading Transformers Above 100 MVA

Scheduled for publication as a trial use document about April 1, 1984.

P757 - IEEE Guide for Loading Power Apparatus Bushings

Passed ANSI C76 ballot. Work still underway in ANSI C76 to incorporate document within Bushing Application Guide (C76.3). Working Group reactivated to develop thermal constants.

P784 - Transformer Through Fault Current Duration Guide

Through Fault Duration Guide considered by the Standards Board on June 23, 1983 and approved as submitted. Now ready for C57 ballot.

P785 - Transformers Connected to Generators

Still under deliberation by Working Group.

P786 - Transformer Failure Reporting and Reliability Analysis

Has been balloted in the Transformer Committee. Some negatives have been resolved. A major negative issue involves litigation which is being pursued with the IEEE legal staff. A ballot of Draft #6 is anticipated in April or May 1984.

P799 - Guide for Handling and Disposing of Askarels

Draft #4 ballot out to Subcommittee.

P800 - Bushing Application Guide

Comments on Draft #1, ballots on P800.1 (Application of Bushings in Conservator Type Transformers) being balloted in Transformer Committee.

Work being done in ANSI C76 to incorporate a bushing application guide to include forward and already approved sections on purpose, scope, contriliver loading and loading of bushings applied to transformers above nameplate ratings.

P801 - Recommendations for Revisions to ANSI C57.15 Requirements, Terminology, and Test Code for Step-Voltage and Induction-Voltage Regulators

Draft #9 is being prepared for balloting of Transformer Committee.

P838 - Guide for Performing Overload Heat Runs

Evaluating results of Working Group ballot in preparation for Draft #8.

P842 - Loss Evaluation Guide

Draft #8 was reviewed at 7/21/83 meeting of West Coast Subcommittee. Some progress was made on simplification and definitions. No meetings held since.

P852 - Bushings to Operate in Gas-Insulated Substation

Draft #1 still in progress in Working Group.

P954 - Guide for High Temperature Hydrocarbon

Preliminary draft being prepared.

There are a few projects which are still in limbo.

P670 - Instrument Transformers for High-Voltage Circuit Breakers

Last reported action was mailing of ballot P670/D4 dated September 16, 1980. This project has apparently come to rest since the chairman's (Jim Beehler) move to Columbus and his subsequent retirement from AEP. It should be revived. The two subcommittee's involved are C37.077 of the Switchgear Committee and C57.13 of the Transformers Committee.

I did not receive a report from the Sound and Vibration Subcommittee.

The Task Force has been formed to review dielectric test requirements for Shunt Reactors, C57.21. W. N. Kennedy is chairman but no progress report yet.

West Coast Transformer Subcommittee is reviewing work of two other subcommittees in relation to fire protection (P979 an P980). So far nothing substantial enough to submit PAR.

There will be a meeting in Vancouver to attempt to resolve some problems encountered in the final approval of the revision of Dielectric Tests C57.90 and various paragraphs and sections of C57.12.00. As chairman of the Standards Subcommittee, I have been given the charge to assemble the various projects as they are completed and forward them to IEEE.

If readers of this report note any projects listed that are no longer active or valid and should be removed or if any active ones are not listed, please let me know so that I can add or delete as necessary. Please furnish P number, title, and relation to IEEE or ANSI Standard.

Ray Smith

Ray Smith, Chairman
Standards Subcommittee

EXHIBIT IV

STATUS OF IEEE AND ANSI C57 BALLOTS, AND PRINTING

2/16/8

ANSI C57 BALLOT NO. OR IEEE PROJ. NO.	BRIEF DESCRIPTION	IEEE STD BD SUBM.	ANSI C57 COMM SUBM.	PUB. REV.	ANSI BSR SUBM.	EDIT TYPE SET	PRIN
P353	HVACC, C57.12.55, Dry Type	N/A	Rebltg. (Neg. Vote)				
P356	HVACC, C57.13.2, Inst. Tr.		C		To Be Subm.		
P65	ANSI/IEEE C57.12.56-198X Dry-Type Insul. Testing (Models) (Formerly known as IEEE 65)	C	C		Sched. To BSR By 4/30/84		
P93	ANSI/IEEE C57.98-1982 Impulse Test Guide	C	C		To Be Subm. To ANSI BSR		
P784	ANSI/IEEE C57.109 Short-Circuit Duration	C	To Be Bltd.				
P756	Trial Use Loading Guide 100+ MVA	C	See Note Below				

Note - Recent IEEE info lists this as an available trial-use standard IEEE - 756. Thus - it will not be balloted by ANSI at this time, and will not be reported further until balloted by ANSI C57.

Subm. = Submitted Bltg. = Balloting IP = In Process C = Complete N/A = Not Applicable

John C. Dutton

John C. Dutton, Chairman - IEEE Delegation to ANSI C57
14

cc: SI Sherr, B Stanleigh, M Goulding, F Huber, WJ McNutt, LJ Savio, DA Yannucci, OR Compton, RL Smith, TL Mayes, BF Allen, CH White, R Hansen, C. Zegars, V. Morgan, LW Long, R Uptegraff, R. Ensign

APPENDIX 1C

1884 1984
A CENTURY OF ELECTRICAL PROGRESS
IEEE

POWER ENGINEERING SOCIETY
TRANSFORMERS COMMITTEE
Leo J. Savio, Chairman

L. A. Swenson
Bonneville Power
Administration
P.O. Box 3621
Portland, Oregon 97208
PLEASE REPLY TO (Above)

AUDIBLE SOUND AND VIBRATION SUBCOMMITTEE
Richard E. Liebich, Chairman

MINUTES OF THE MEETING OF THE AUDIBLE SOUND AND VIBRATION SUBCOMMITTEE
at Vancouver, B. C., April 3, 1984

The meeting was chaired by the secretary, Len Swenson, in the absence of the Chairman. Eight members and four guests were present. The minutes of the last meeting in Dearborn, Michigan were approved.

The organization of the working groups was discussed. The members present voted to change the name of working group four from "Environmental Technology" to "Audibility, Annoyance and Community Reaction." It was also suggested that five of the working groups be consolidated into three as there is some duplication in their assignments. The working group assignments will be reviewed with this in mind and to insure that each working group will have a definite connection to a standard, a recommended practice, an IEEE guide, etc.

There is no table of maximum shunt reactor sound levels. A guest suggested review of a Canadian shunt reactor standard. It was also suggested that shunt reactor manufacturers be contacted to obtain their recommendations for maximum shunt reactor sound levels. This might include liaison with the National Electric Manufacturers Association.

Many transformer users are now looking at short-term costs only and reducing loss evaluation factors. This is due to short-term outlook on financing with high interest rates. The result may be a return to higher transformer sound levels.

An outline, entitled, "Predicting Resident Responses to Transformer Substation Audible Noise" by Dr. John Molino was presented. This outline is for use in determining the future activity of W.G. 4 which is chaired by Dr. Molino.

Concerns of Allan Teplitzky, Chairman of W.G. 5 were presented. He feels strongly that a better transformer noise measurement standard for use by manufacturers is needed. He is chairman of an ESEERCO committee studying transformer noise measurement methods.

Robert Putnam, chairman of W.G. 6, is working on a new ASTM standard for noise measurement. He is studying new measurement techniques including the 2-surface method and acoustic intensity.

Although five out of six of the working group chairmen were unable to attend this meeting, most of them plan to attend the October meeting in Boston.

Lennart A. Swenson

Lennart A. Swenson, Secretary
Audible Sound & Vibration Subcommittee

APPENDIX 1 CA

L. A. Swenson
Bonneville Power
Administration
P.O. Box 3621
Portland, Oregon 97208
PLEASE REPLY TO (above)

POWER ENGINEERING SOCIETY

TRANSFORMERS COMMITTEE
Leo J. Savio, Chairman

AUDIBLE SOUND AND VIBRATION SUBCOMMITTEE
Richard E. Liebich, Chairman

MINUTES OF THE MEETING OF THE AUDIBLE SOUND AND VIBRATION SUBCOMMITTEE
at Dearborn, Michigan, November 8, 1983

Twelve members and eight guests were present. One guest requested membership, which would bring the membership of the Subcommittee to 22. The minutes of the previous meeting in Atlanta were approved.

Prior to the meeting the Subcommittee Executive Committee decided all working group chairmen should submit to the Chairman a description of future activity. A 2-month deadline for the report was established.

The Chairman, Richard Liebich, presented his proposal to prepare an updated list of references. J. Pollitt offered use of word processing facilities to assist in the project.

Len Swenson, W.G.-2 Chairman, indicated plans to issue another, more complete and appropriate, questionnaire for establishing sound level data bases.

Richard Liebich reported for Dr. Molino, W.G.-4 Chairman. Dr. Molino is preparing a project proposal to develop procedures for estimating core-tone audibility.

Comments were made by two members about shortcomings of present NEMA transformer sound level measuring methods. Lack of narrow band-tone requirements is the primary complaint.

Steven Nuspl of Babcock & Wilcox, as guest speaker, presented background on development of ASTM draft standard for two-surface method of sound power meaaurement in reflective industrial environments.

Lennart A. Swenson

Lennart A. Swenson, Secretary
Audible Sound & Vibration Subcommittee

Bushing Subcommittee - L. B. Wagenaar

The bushing subcommittee met at 8:00 a.m. on April 3 with 9 members and 4 guests present.

Rick Stockum, chairman of the working group on bushings to operate in gas insulated substations, reported that the group met on Monday. The group is making good progress on the first draft of a document to cover bushings which interface between transformers and gas-insulated bus. Discussion covered several points, including the following:

1. The document will cover a relatively new type of bushing and its useage thus far has been low. It is therefore felt that the document should permit a large degree of flexibility and for this reason, the working group is considering making it a guide or a trial use standard.

2. Maximum temperature limits presently specified in gas-insulated substation standards are very pessimistic with regard to the use of oil-impregnated paper bushings. However, John Easley has proposed that the enclosure surrounding the SF6 end of the bushing will have little effect on the temperature characteristics of the bushing. An expert in the GIS field basically agrees with this conclusion and Mr. Easley has sent letters to several persons in the transformer and GIS fields explaining this concept.

Discussion at the Bushing Subcommittee meeting yesterday concentrated on the revision of IEEE 21/d4 (ANSI C76.1). The latest ballot of the subcommittee resulted in 15 of 18 ballots being returned with 8 ballots affirmative and 7 ballots affirmative with comment. Several changes were made in the document and draft 5 will be balloted within the Transformers Committee and the Bushing Subcommittee.

Preliminary results of the Transformers Committee ballot of P800.1/d2 - Application of Bushings in conservator type transformers were also reported. Of the 125 ballots sent out, 96 ballots (77%) have been returned so far. Results were 75 affirmative ballots, 9 affirmative ballots with comment, 6 abstaining ballots and 6 negative ballots. This item has been referred back to the Ad Hoc Committee which developed this document for resolution of negative ballots and comments.

As a result of a request at the Detroit meeting, the topic of minimum size of liquid level gage was also discussed. It was decided that the matter would be referred to the NEMA JSC on power apparatus bushings.

The fate of the ANSI C76 Apparatus Bushings committee was also discussed at the Administrative and Bushing Subcommittees. The Bushing Subcommittee concurred with the discussion within the Administrative Subcommittee that it become a part of C57 transformers. The Bushing Subcommittee chairman will write a letter to IEEE Standards Board to formulate this position mentioning that transformers and high voltage bushings share oil-impregnated paper insulation technology and that circuit breakers are using oil-filled bushings on a decreasing basis.

C76.2 was to have been published during the week of March 22 and work is underway in C76 to write the forward to the bushing application guide. The latter will include the bushing loading and allowable top end line pull guides.

L. B. Wagenaar
Chairman, Bushing Subcommittee
04/23/84

Meeting Minutes
Dielectric Tests Subcommittee
Vancouver, British Columbia
April 3, 1984

The meeting was called to order at 1 p.m. with 35 members and 30 guests in attendance.

It was announced that one new member had been added since the fall meeting - Mr. Y. P. Iijima of BPA.

The minutes of the previous meeting were approved as published.

The four working groups reported on their activities as follows:

Working Group for Revision of Dielectric Tests - G. W. Iliff.

Mr. Peter Iijima has agreed to act as secretary of the working group and help George with the paper work.

The impulse test guide which had been stalled at the ANSI level is moving again toward publication. A task force was formed to again review this document and begin the next revision. They are to particularly look at adding information on switching surges, short tail waves and voltage reversals during impulse testing.

The Task Force on Revision of Dielectric Test or Shunt Reactors reported that they had met and their discussions centered around:

1. Recommending a 1.5 P.U. overvoltage test but without the 1.7 P.U. enhancement.

2. Recommending a maximum corona level of 200 microvolts with a maximum increase of 30 microvolts during the test.

3. Examining ways to test 3 phase reactors using single phase sources.

The Task Force on External Clearances reported that it had met in March and discussed the following:

A review of the literature indicates that there are two general cases wherein high magnitude phase-to-phase switching surges can occur:

1. Energizing a transformer and a line or energizing a transformer by itself. This case generates voltages of up to 3.8 times the peak line-to-ground voltage and front times are in the 2 to 3 millisecond range. These voltages are about 10% above the levels specified in IEEE 261 B.

2. Switching in capacitors generates up to 4.2 times the peak line-to-ground voltage and faster front times in the order of tens of microseconds. These voltages are about 20% above the 262 B levels.

On the other hand, experience with the 262 B switching surge voltages has apparently been good. The task force will next investigate clearances on existing EHV transformers and whether any phase-to-phase flahsovers have occurred on EHV transformers.

The Chairman reported on the latest ballot of the full committee on Section 5 of C57.12.00 and Section 10 of C57.12.90. There were three negative ballots which he had been unable to resolve. An adhoc task force met on Monday with two of the negative voters present. A number of editorial changes were agreed to and these will be circulated to the Working Group for comments. However, there were several issues that still could not be resolved. The negative voters wanted the section on coordination of insulation levels, 5.10.3, moved to some other document. The task force voted unamiously to leave it in the present draft and to present both views to the Standards Board. It was also decided to reballot two sections; table 14 and 5.10.7.2 concerning switching surge transfer through the windings. It was also agreed to rewrite two other sections; 5.10.2 on insulation levels of neutrals not solidly grounded and 5.10.4.2 and 5.10.4.3. concerning the interaction of low frequency tests.

The third negative ballot was considered during the Working Group meeting. (The negative voter was not present in Vancouver). This vote was against the inclusion of the $\pm$ 3% tolerance on the peak value of the impulse wave and the deletion of method 1 for neutral impulse testing. The tolerance had been added because it is recognized by IEEE Std. 4, which is referenced in ANSI C57.12.00, and because the tolerance was being used by some manufacturs. The method 1 for neutral testing had been deleted because it is not used in the USA and is therefore obsolete. The Working Group voted to proceed with the document as is.

Working Group on Revision of Dielectric Test on Distribution Transformers - W. R. Farber.

The Chairman reported on the status of our proposal to include a tabulation in table 6 of ANSI C57.12.00 to require a phase to phase insulation test for distribution transformers. Jerry Corkran had balloted the Dielectric Test Subcommittee prior to the November 7 meeting and had reported only one unresolved negative ballot. In the interim the Chairman corresponded with this member and the negative ballot has been removed. At the November 8 meeting of the Dielectric Test Subcommittee permission was granted to include this addition to table 6 in George Iliff's ballot of the Transformers Committee on C57.12.00 and C57.12.90/D4. This has been done and George has advised me that there were no negative ballots on this proposal.

The next agenda item concerned discussion of Bill Henning's recent questionnaire on the Working Group's proposal for mandatory routine impulse tests of distribution transfomers. As suggested at the last meeting Bill has sent to the W. G. members a questionnaire designed to identify areas of potential agreement and disagreement. Included were questions involving transformers to be covered, number of impulses, failure detection methods,

pass/fail criteria, wave shape tolerances, taps and series/multiple connection, dielectric test sequence, connections of untested terminals, polarity of tests and inclusion of a suggested, but not required, LV impulse test. Bill had received 9 returns prior to the meeting and he reported these results. Some items showed unamimous, or near unanimous agreement, while others indicate disagreement. Bill will attempt to get returns from those not responding within the next two weeks and will then summarize the total result. He will then proceed to prepare test code type information in recognition of the responses received.

A discussion then followed on EPRI Report EL-3385, "Surge Characteristics and Protection of Distribution Transformers" which reported on work done by the General Electric Company to identify possible causes of distribution transformer failures. A copy of this report had previously been sent to Working Group members.

Working Group on HVDC Stressed Transformers and Reactors - W.N. Kennedy.

At the beginning of the meeting D. A. "Jim" Gillies discussed the need for specifications covering heat ~~test~~ run and loss tests on converter transformers. We agreed that such documentation is necessary and although our particular working group was not the place for it, many of our members would probably also be present on that task force or working group. I will write a letter to L. Savio describing the need for such a group.

The remainder of the meeting concentrated on our latest (March 1984) draft on "Dielectric Tests and Test Procedures for HVDC Stressed Transformers and Reactors". There is general agreement as to the technical content of the paper; all of the changes discussed at our present meeting were editorial and included:

1.) changing the title to "Recommended Dielectric Tests and Test Procedures for Converter Transformers and Smoothing Reactors."

2.) adding a sentence in the discussion of recommended temperature of dc dielectric testing to include the condition where the ambient is less than 20°C.

3.) clarifying the section discussing measurements of partial discharge to emphasize that pd behavior under dc testing is very different from ac patterns, and that pd measurements occuring within the interval of polarity reversal should be disregarded because of external discharges which occur at that time.

4.) updating the references to include any relevant papers published since 1977 and

5.) adding some clarifying information to the illustrations.

These changes along with some minor ones will be incorporated into one more draft which we will discuss at the next meeting. Our goal will be to prepare a paper for submission to the Summer Power Meeting in 1985.

Working Group on Partial Discharge Tests - H. R. Moore.

The task forces for measurement of apparent charge and for Acoustic Detection of Partial Discharges both had well attended sessions earlier in the day.

Mr. G. Vaillancourt, Chairman of the Task Force for Measurement of Apparent Charge reported on the balloting within the Working Group on the Trial Use Guide for Partial Discharge Measurement. The results were as follows:

16	Approved
4	Approved with comments
6	Not approved
2	Not voting
4	Not returned

Since this ballot did not result in the required 75% approved votes, the document will be revised in line with comments made on the ballots, in the task force meeting, and in the Working Group meeting. The main remaining issue is the band width in the Trial Use Guide compared to a narrower band width. After much consideration, the Working Group voted to keep the present band width recommendations for the next ballot.

The Working Group decided to submit the revised Trial Use Guide for Partial Discharge measurements in Power Transformers and Shunt Reactors (REVISION 4) for balloting in the Working group.

It is anticipated that the results of this ballot will be presented at the next meeting of the Working Group.

Mr. E. Norton, Chairman of the Task Force for Accoustic Detection of Partial Discharges reported on their progress.

A proposed Guide for the Detection of Acoustic Emissions from Partial Discharges in Power Transformers has been prepared. This draft is based on the EPRI Acoustic Detector. The objective was to present this guide as an example of the format that can be utilized for different detectors. The overall objective is to prepare a guide which will assist users and manufacturers in the use of different acoustic detectors.

Mr. Norton stated that the task force meeting indicated that the guide should be more tutorial in nature. It should contain sufficient detail on the equipment and procedure so that they can be used to conduct tests on transformers.

Mr. Norton requested that other persons and companies having experience with acoustic detectors submit information on the equipment and procedures so that they can be included in the guide.

After the reports of the Working Groups were completed, there being no new business brought before the Subcommittee, the meeting was adjourned.

Following the adjournment, a presentation by Dr. R. Malewski on the measurement of impulse waves using digital equipment was well attended. The information presented was taken from work done at IREQ and compared the response time and accuracy of this type equipment with standard oscilloscopes.

APPENDIX 1E A

Meeting Minutes
of the
DIELECTRIC TEST SUBCOMMITTEE

November 8, 1983
Dearborn, Michigan

The meeting was called to order at 1:15 p.m. with 23 members and 35 guests in attendance. After the meeting, three of the guests expressed a desire to become members and their names were added to the roster.

They are:
R. A. Veitch - Ferranti Packard
J. W. Mathews - Baltimore Gas & Electric
D. J. Fallon - Public Service Electric & Gas

The membership now stands at 62.

There are presently four working groups which report to this Subcommittee and their work is progressing as follows:

Working Group on Revision of Dielectric Tests

Chaired by G. W. Iliff

1. Meeting called to order at 3:00 p.m. on November 7, 1983 with 19 members and 19 guests in attendance.

2. It was noted that C57.98, the Impulse Test Guide, was not yet published even though the IEEE Standards Board had approved it at least a year and a half ago. Harold Light will check on the status of the document and try to expedite publication.

3. Bill Kennedy, Chairman of the Task Force on Revision of Shunt Reactor Dielectric Test Requirements, reported that it now appears that most manufacturers can perform the one hour, 1.5 p.u. low frequency test the same as is proposed for transformers. One exception is the case of three phase reactor transformers. The Tank Force therefore will revise the turn-to-turn test to be a one hour, 1.5 p.u. low frequency test but allow single phase tests on three phase reactors if necessary. Switching Impulse test requirements will be developed to test the phase-to-phase insulation where three phase low frequency tests cannot be performed.

   The Task Force will also be considering a different wave form for Switching Impulse tests since the conventional wave form is difficult to obtain on shunt reactors.

   They plan to issue copies of proposed revisions prior to the next meeting in the spring.

4. L. S. McCormick reported that NEMA had met recently but had not been able to do anything about external clearances because data from a questionnaire had not been tabulated. The Working Group discussed the slow progress and expressed a desire for quicker action. Jim Douglass' Task Force will therefore be requested to add this subject to the scope of their work. Basically, Jim's task force is concerned with phase-to-phase switching impulse levels so this is very appropriate in the case of EHV where external clearances are based on switching impulse considerations. However, at 230 kV and below, the clearances have been based on lightning impulse requirements. Nevertheless, the task force will also consider external clearances for the transformers in this lower range.

5. Loren Wagenaar reported on behalf of Jim Douglass for the Task Force on Phase-to-Phase Switching Impulse Levels. To date, they have concentrated on reviewing available literature and data and feel they will have adequate information to meet their needs. This work is not complete but it does appear that the phase-to-phase tests may be somewhat higher than previously thought.

6. George Iliff reported on the results of balloting the the W.G. and Subcommittee on Section 5 of C57.12.00 and Section 10 of C57.12.90/D3 Revision of Dielectric Test Requirements. The results were as follows:

	W.G.	Subcommittee
Sent out	38	58
Approved	26	45
Approved with comments	7	9
Not voting	1	2
Not approved	4	2
	38	58
After Resolution Efforts:		
Approved	36	53
Approved with comments	1	3
Not voting	1	2
Not approved	0	0

Negative ballots and comments were resolved through discussion or by minor changes which in no way affected test levels or test procedures.

One item that developed later involved a note from the current C57.12.00 to the effect that tertiary windings brought out to terminals should have surge arrester protection. There were many comments about the wording (awkward) plus comments that it should apply to any winding. So, the language of the note was cleaned up and the note was made applicable to any winding. After the meeting, someone noted that there are cases on under ground systems where you will not want to apply arresters. This little note has therefore turned out to be a real problem. For resolution, I suggest we delete the note and I will then write to the Surge Protection Devices Committee and recommend they cover the subject in C62.2 - "Guide for Application of Valve Type Surge Arresters for Alternating Current Systems" which is already referenced in our document.

The second issue associated with the document was a review of the separate ballot on where to draw the line between Class I and Class II. The results were as follows:

	W.G.	Subcommittee
Approved	34	51
Not voting	2	3
Not approved	2	4

Discussion followed on various compromises; however the W.G. voted overwhelmingly to continue on the basis of including all transformers 115 kV and above in Class II as proposed. The actual count was 16 votes vs. 1 for the same thing except for making lightning impulse test optional (other) for 115 to 230 kV transformers.

Another possibility by three of the negative ballots (who were not there) was to draw the line at 161 kV and above.

In any event, the consensus was to go as proposed and to work on resolving the negative ballots which appeared to have a good chance of success.

In subsequent discussions with L. S. McCormick, it appears proper, if we cannot resolve the no ballots, to revert back to the original dividing line for Class II, i.e., 345 kV and above plus the large 115 - 230 kV transformers.

7. There was a proposal received from Dr. Malcuski to form a new task force to consider digital recording of voltage and current oscillograms. The W.G. decided to wait. Mr. Malcuski will be invited to attend another meeting and bring us up to date so we could better decide if such a task force is appropriate.

Working Group on Revision of Dielectric Tests on Distribution Transformers

Chaired by W. R. Farber

The Working Group on Revision of Dielectric Tests on Distribution Transformers met at the Hyatt Regency Hotel in Detroit, Michigan on November 7, 1983 at 10:15 a.m. Present were 11 of the current 18 members and 12 guests. R. L. Grunert has resigned from the working group.

Minutes of the April 11, 1983 meeting held in Atlanta, GA were approved. The Chairman read Mr. Corkran's report on his ballot of the Dielectric Tests Subcommittee to require a minimum phase to phase test level for three phase distribution transformers of two times nominal system voltage. Results were:

	Subcommittee
Approved	43
Approved with comments	2
Not approved	3
Not returned	13
Total	61

Two of the three negative ballots have been resolved. The third was submitted by Dr. Stein whom we have not yet been able to contact. We will ask the Subcommittee for permission to ballot the Transformer Committee. (At the subsequent Subcommittee meeting we were granted permission to incorporate these changes in Table 6 as a part of George Iliff's ballot of the Transformer Committee on changes in ANSI C57.12.00.)

Mr. Henning led the discussion of the Proposed Impulse Test Guide for Distribution Transformers prepared by his Task Force. He distributed and discussed comments submitted by Maurice Frydman of Hipotronics, Inc.

Mr. Henning identified possible controversial issues of the Guide as:

1. The number and magnitude of impulses to be applied to each HV terminal.
2. The configuration of untested terminals.
3. The failure detection means.
4. The inclusion of a suggested, but not required, LV impulse test.

After considerable discussion it was decided that in order to further identify the areas of controversy and agreement, Mr. Henning would draft a questionnaire for submission to the Working Group members. The questionnaire would ask for approval or disapproval of a number of specific items and would be circulated, similar to a ballot, to Working Group members prior to our next meeting.

On a separate subject, Mr. McMillen reported that the report on his company's investigation of anomalous failures of distribution transformers had been submitted to EPRI and should be issued shortly.

There being no further business, the meeting was adjourned at 11:30 a.m.

Working Group on HVDC Stressed Transformers and Reactors

Chaired by W. N. Kennedy

The meeting was called to order at 8:00 a.m. on November 7, 1983. Six of the nine members were present, along with two guests.

Since the April meeting, two drafts of our paper on HVDC dielectric tests have been mailed out to our working group. The first draft included some minor changes to the draft discussed in Atlanta. Comments received from the group indicated a need to reorganize the paper and include additional information. As a result, the paper was rewritten and a second draft was mailed out in October. Most of the attention of our November 7 meeting was directed toward the latest draft.

Some discussion concerned itself with the direction the paper should take. We agreed that the present draft is in the form of a working group tutorial paper describing our recommendations for dielectric testing and justifications for our conclusions. When the paper is approved for publication,, it can be used as the basis for a guide or temporary standard.

Members were generally pleased with the latest draft. As well as some minor word changes, members requested:

1. Additional discussion on the resistivity characteristics of oil and cellulose reason for performing HVDC tests at 20°C rather than elevated temperatures.

2. A new illustration and added text showing the operating voltage waveshape on reactors and valve windings of converter transformers.

3. Elimination of two obsolete references to using switching impulse tests in lieu of polarity reversal tests.

These changes will be incorporated into the paper, and will be mailed out simultaneously to members of the working group and dielectric test subcommittee for comments before our next meeting.

Working Group on Partial Discharge Tests

Chaired by H. R. Moore

The Working Group met at 1:00 p.m. on November 7, 1983 with 11 members and 12 guests present.

The minutes of the April 11, 1983 meeting were approved as written.

Mr. G. Vaillancourt, Chairman of the Task Force for Measurement of Apparent Charge, reported on progress since the Atlanta meeting which is summarized below:

1. The draft of the Guide for Partial Discharge Measurement in Power Transformers and Shunt Reactors had been revised in line with comments received from members.

2. Results of the questionnaire on PD measurements were discussed.

3. Test results using different PD detectors were reviewed.

After a discussion on the revised, the Working Group decided that the following actions should be taken:

1. The Working Group will submit any additional comments on the Guide to Mr. Vaillancourt by January 1, 1984.

2. Revision 3 of the draft will then be made.

3. This draft will be submitted to the Working Group for balloting as a Trial Use Guide for Partial Discharge Measurement in Power Transformers and Shunt Reactors. It is hoped that the results will be known by the next meeting.

Mr. E. Howell presented the report of the Task Force for Acoustic Detection since Mr. Norton could not be present. Proposals for acoustic detection by various methods are being considered. Mr. Howell requested that other interested persons join this task force to help accelerate their progress.

The meeting was adjourned at 2:20 p.m.

There being no new business, the Subcommittee was adjourned after this report.

DRY TYPE TRANSFORMER SUBCOMMITTEE
REPORT TO THE TRANSFORMERS COMMITTEE

The Dry Type Transformer Subcommittee met at 1:00 p.m. on Tuesday, April 3, 1984 with 13 members and 5 guests present. The Working Groups reported as follows:

W.G. on Standards for Dry-Type Transformers Incorporating Solid Cast and Resin Encapsulated Coils chaired by Mr. Egon Koenig met on Monday with 14 members and 4 guests present. Mr. Jack McGill has joined this W.G. The group reviewed the changes in test code C57.12.91 proposed by Mr. Jonatti's Task Group IV. The objective is to make this test code apply to all dry type transformers. Other revisions resulting from experience and new information will also be processed by this W.G. It was agreed that a partial discharge test would be added to the section on dielectric tests. The Dielectric Problems W.G. has been asked to develop the detail procedures for this test. Due to lack of time, some agenda items were not covered.

W.G. on Dielectric Problems chaired by Mr. Jerry Corkran met on Monday with 7 members and 8 guests present. Since the last meeting, D5 of P745 "Guide for Conducting a Transient Voltage Analysis of a Dry Type Transformer Coil" has been balloted successfully in the Transformers Committee with an 82% ballot return prior to the established deadline. There were 69 approvals, 10 approvals with comment, 1 negative based on the use of the word "shall" instead of "should", 22 not voting and 23 not returned prior to the deadline. The negative has been resolved. The comments were reviewed and editorial changes made. These editorial changes will be circulated to all W.G. members after which the document will be forwarded to the Standards Board. This W.G. will assist Mr. Koenig's W.G. with the partial discharge test procedure.

W.G. to Revise Loading Guide C57.96 chaired by Mr. Bill Mutschler met on Monday with 8 members and 4 guests present. Draft 4 dated March 9, 1984 of the revised guide was reviewed with emphasis on the major changes. The W.G. voted to retain relative life vs. temperature and include information for average winding rises of 80°C, 115°C, and 150°C. The W.G. voted to delete the section pertaining to transformers with only nominal rather than continuous ratings. A new Draft 5 with all the agreed-upon changes will be prepared and balloted simultaneously in the W.G. and Dry Type Transformer Subcommittee.

Dry Type Transformer Fault Duration Guide W.G. chaired by Mr. Roy Uptegraff, Jr. met on Tuesday with 11 members and 7 guests present. Draft 1 of the proposed guide was discussed mainly from the standpoint of thermal considerations during the fault interval. At this point, it has been suggested that the total time interval for the guide be somewhat less than for the liquid transformer guide due to the location of the transformers in a system. It is proposed that for Category I transformers the $I^2T = 1250$ curve be retained. For Category II transformers, addition of curves for 6, 8, and 10% impedance is being considered. A Draft 2 will be prepared for ballot in the W.G.

Continued.....

Thermal Evaluation W.G. chaired by Dr. George Bowers met on Monday with 10 members and 5 guests present. An initial discussion draft titled "Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers" was discussed. Proposals for inclusion in the next draft were agreed upon.

W.G. on Evaluation of Insulation System for Specialty Transformers. This W.G. is currently without a chairman. It also is in need of additional members. Therefore, anyone who is interested in this subject is requested to volunteer for W.G. membership. A volunteer for W.G. chairman is also solicited.

B. F. Allen

APPENDIX 16

GENERAL ELECTRIC

METER BUSINESS DEPARTMENT
GENERAL ELECTRIC COMPANY • MAIN STREET • SOMERSWORTH, NEW HAMPSHIRE 03878 • (603) 692-2100

March 26, 1984

MINUTES OF IEEE INSTRUMENT TRANSFORMER SUB-COMMITTEE MEETINGS AT ROOM 1033, CHATTANOOGA BANK BUILDING, CHATTANOOGA, TENNESSEE, 3/20/84 AND 3/21/84

PRESENT: (both days)

Members	Alternates	Guests
L. R. Smith	J. Gotal, for E. Conner	None
H. R. Lucas		
D. L. Hillhouse		
J. Davis		
E. Basso		
P. P. Falkowski		
S. Lee		
J. E. Lyles		
R. C. Thomas		
R. B. Stetson		

Copies to: C. F. Burke, E. Conner, C. C. Crichton, R. A. Magill, W. E. Morehart, J. W. Walton, O. Petersons, J. M. Carr, W. R. Ossman, L. S. Corey, O. R. Compton

The 3/20/84 meeting opened at 8:30 A.M. and adjourned at 5:45 P.M., having recessed from 12:00 A.M. to 1:00 P.M. for lunch.

The 3/21/84 meeting opened at 8:02 A.M. and adjourned at 11:45 A.M.

Chairman Thomas presided at both meetings.

The minutes of the 11/7/83-11/8/83 meeting in Dearborn, Michigan were approved as distributed.

The agenda for the meeting was completion of the final draft of the C57.13 revision. The material for the entire draft was reviewed, except for References, Bibliography, Contents, and the few pages preceding Contents.

A great number of editorial changes were made for clarification and improvement, in addition to reaffirming changes adopted during earlier work on the revision.

Some of the changes in this meeting were:

1) Addition of C57.13-1973 and the current revision to the historical summary in the Foreword

2) Addition of 1425 and 1550 BIL lines to Table 2 (Base Impulse Insulation Levels and Dielectric Tests)

3) Completion of substantial rearrangement of voltage transformer group coverage.

4) Major revision of the voltage transformer burden table, particularly the notes.

Mr. Basso offered to provide a formal draft, incorporating all accumulated work on this revision. This draft will be identified as P546/D1.

The next meeting of the Sub-Committee will be in Boston, Mass., in conjunction with the fall, 1984, meeting of the Transformer Committee.

Respectfully submitted,

Ralph B. Stetson-Secretary

/fd

0181E

REPORT OF THE INSULATION LIFE SUBCOMMITTEE TO THE TRANSFORMERS COMMITTEE

April 4, 1984 - Holiday Inn Harbourside, Vancouver, BC

The Insulation Life Subcommittee met yesterday, April 3, 1984, with an attendance of 21 members and 27 guests. All three of our working groups reported. Bill Wrenn reported for the Working Group on Guides for Loading since Ron Olsson, Chairman, was unable to attend these meetings because of business pressures. Attendance at their Monday meeting, April 2, 1984, was 15 members and 7 guests. Olin Compton presided in place of Ron Olsson. Charles Mitchell had informed Olin that the Trial Use Loading Guide for Power Transformers Above 100 mVA is expected to be published this month by IEEE. Bill Wrenn reported that the Step and Induction Voltage Regulator Loading Guide revision was unanimously approved by the IEEE Standards Review Board March 21. The Current Limiting Reactor Guide Task Force may have a Chairman as Rus Minkwitz has been in contact with Dr. H. Pflanz. Dr. Pflanz is presently leaving Phoenix Electric to go into business for himself and is considering volunteering for the chairmanship. Bob Veitch informed us that the Manager of Engineering of Trench Electric has volunteered for the Reactor Task Force, but said he cannot assume the chairmanship. This is welcome news as Trench is a major manufacturer of this apparatus.

The Working Group discussed the question of the accuracy of loading guide equations. The group desires further input from Orrean Chew as highly desirable. Chuck McMillen submitted a comparison of the present loading guide equations with IEC's proposed equations for distribution transformers as related to actual temperature rise tests above nameplate on 25 kVA distribution transformers. The comparisons showed that the IEC method is similar to ours, but utilizes an exponential attenuation multiplier to the calculated change in resistance. This method more accurately predicts the ultimate winding rises and top oil rise. A copy of the comparison will be supplied with the working group's minutes. Bill McNutt emphasized that design differences between manufacturers could require the use of different exponents.

Jacques Aubin reported on the results of the Tokyo meeting of the IEC that dealt with the revision of their loading guide. The initial draft was sent back to the working group for additional revision. A subsequent meeting of the group developed a philosophy of providing tables and simplified information for quick use by operations personnel and a more accurate set of equations for use by those who desire more precise data. A new draft will be submitted for balloting within the group by June of this year, with the aim of getting the document to the National Committees by the start of 1985. The comparison of the IEC's Montsinger doubling rule with our Anhenius curve method of estimating life expenditure was also discussed.

Under new business Olin Compton requested information from utility members on daily peak loading curves in order to guide us in the next revision of the guides. The meeting adjourned, but was followed by a round-table discussion of various proposed approaches that will improve the next revision of the Power and Distribution Transformer Loading Guides.

Al Wurdack reported on the meeting of the Thermal Evaluation of Oil-immersed Power and Distribution Transformers Working Group Monday with 6 members and 10 guests in attendance. P345, the revision of ANSI C57.100, the Standard Test Procedure for Thermal Evaluation of Oil-immersed Distribution Transformers, has been approved by the Standards Review Board and is now being forwarded to ANSI for the next stage of approval. Bob Grubb has agreed to submit a proposed addition to the procedure for its next revision to supplement measurement of insulation aging by analysis of the gas content in the oil. Under new business the group was informed of the approval by the Administrative Subcommittee to initiate work on a procedure for thermal evaluation of power transformers similar to the distribution transformer document. Anyone desiring to work on this new task please contact Al Wurdack.

Bob Veitch, Chairman of our third working group, the Thermal Tests Working Group, reported they also met Monday with an attendance of 12 members and 9 guests. He reported on the results of their group ballot on Draft 7 of P838, Recommended Procedures for Performing Temperature Rise Tests Above Nameplate Rating. Results were 13 approved, 4 approved with comments, and 6 not approved. All but one of the negatives were resolved and that will require additional contact. An approximate method for determining the increment required for compensating for core loss was proposed. Use of direct reading measurement of hottest spot will be mentioned, but not required. Infra-red scanning to detect hot spots on the tank wall will be proposed with follow-up checking with thermo-couple readings at detected hot spots. Draft 8 of the procedure will now be balloted by both the Working Group and Subcommittee. The Working Group next discussed Al Goldman's suggested one-hour heat run quality control test for detection of poor contacts. Those submitting discussions agreed that a one-hour test was too short unless temperatures were above 180°C. A twelve-hour minimum duration test was believed to be necessary to generate enough gas to detect incipient faults.

There was no new business.

C. J. McMillen, Chairman
Insulation Life Subcommittee

April 24, 1984

APPENDIX II

May 1, 1984

TO: IEEE TRANSFORMER COMMITTEE
Insulating Fluids Subcommittee Members

FROM: Henry A. Pearce, Chairman

SUBJECT: Minutes of Meeting held April 2 & 3, 1984 in Vancouver, British Columbia

MEMBERS PRESENT

L. Baranowski
D. Crofts
J. Forster
M. Frydman
J. Germain
D. Gillies
T. Haupert
P. Hoeffler
O. Keller
J. Kelley
T. Lipscomb
R. Lowe
G. McRae
C. Miller
E. Morrison
W. Mutchler
S. Northrup
H. Pearce
L. Savio

GUESTS PRESENT

Ross Owen	Texas Power & Light
Brian Klapanski	Carte Electric Ltd.
Karl Bryan	Corps. of Engineers
Fred Huber	IEEE Std's. Office
Nick Dominelli	B.C. Hydro
Ross Nelson	B.C. Hydro
A. Guild	Georgia Power

The Insulating Fluids Subcommittee met on Monday and Tuesday, April 2 & 3, 1984, with seventeen (17) members and eighteen (18) guests present.

1. The minutes of the November 1983 meeting were approved as submitted.

2. There were no membership changes this time

3. The chairman reported that IEEE Headquarters has stated that the "Guide For Reclamation of Insulating Oil And The Criteria For Its Use" should be ready for proof reading in May 1984.

4. Project P799, PCBs - The results of a Subcommittee Letter Ballot on Draft 4 of Project 799, "Guide For Handling And Disposal Of Transformer Grade Insulating Liquids Containing PCBs" were reviewed and discussed. There were two negatives and several comments. The Subcommittee made necessary corrections and resolved the negative votes. It was then voted to prepare Draft 5 and submit for Main Committee Ballot.

5. Project C57.111, Silicone - Draft 4 of the "Guide For Acceptance And Maintenance Of Silicone Liquid In Equipment". Project C57.111 had also been sent out for Subcommittee Ballot. There were 3 negative ballots and many editorial comments. Discussion resulted in extensive revisions and changes and it was voted to prepare a Draft 5 and re-submit for Subcommittee Letter Ballot. It was decided to request ASTM D27 to prepare a Silicone specification.

6. Project P954, High Temperature Hydrocarbons - The Task Force on the "Guide For Acceptance And Maintenance Of Less Flammable Hydrocarbon Liquid In Equipment" presented a preliminary draft of this guide. It was reviewed and discussed and a draft will be prepared for Subcommittee Ballot.

7. Project C57.104, Gas Guide - It was previously decided to prepare and conduct a survey to determine uses and needs of Gas Guide users and to determine limits and guidelines presently being used. A draft of the survey was reviewed and some changes made. It is hoped that the survey can be mailed out this summer.

8. Adjournment

9. Next Meeting - October 14 - 17, 1984, Park Plaza Hotel, Boston, Mass.

H.A. Pearce, Chairman
Insulating Fluids Subcommittee

IEEE TRANSFORMER COMMITTEE

INSULATING FLUIDS SUBCOMMITTEE

Membership - May 1984

CHAIRMAN	H.A. Pearce	Westinghouse Electric Corp. 469 Sharpsville Ave. Sharon, PA 16146 (421) 983-4295
MEMBERS	**COMPANY**	**ADDRESS**
ALLAN, D.J.	GEC Transformers Ltd.	Stafford, ST17 4LN England
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BRYANT, GEORGE	Dow Chemical Co.	Gen Del. B-639 Freeport, TX 77541 (409) 238-7615
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CROFTS, D.W.	Texas Power & Light	P.O. Box 22631 Dallas, TX 75266 (214) 954-5459
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FRYDMAN, M.	Hiptronics, Inc.	P.O. Drawer A Brewster, N.Y. 10509 (914) 279-89091, Ex. 274
GERMAIN, J.P.	Hydro Quebec (519) 289-4447	75 Dorchester Blvd., West Montreal, Quebec, Canada H1Z14A (519) 289-4447
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LOWE, R.I.	The Hartford Steam Boiler Inspection & Insurance Co.	One State Street Hartford, Conn. 06102 (203) 722-5672

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MINKWITZ, R.E., Sr.	New England Electric	20 Turnpike Road Westborough, MA 01581
MILLER, C.K.	T&R Electric Supply	Box 180 Colman, South Dakota 57017 (605) 534-3555
MORRISON, E.L.	Los Angeles Dept. of Water & Power	P.O. Box 111 Laboratory & Tech. Services Los Angeles, CA 90051
MULHALL, V.R.	Canadian General Electric Company	Peterborough Engineering Lab. Peterborough, Ontario Canada
MUSIL, R.J.	American Elin Company	11 Broadway New York, N.Y. 10004
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ROUSE, T.O.	General Electric	100 Woodlawn Ave. Pittsfield, MA 01201
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APPENDIX I J

PERFORMANCE CHARACTERISTICS SUBCOMMITTEE
VANCOUVER, B.C., CANADA - APRIL 3, 1984
MEETING MINUTES

I. INTRODUCTION/ATTENDANCE

The Performance Characteristics Subcommittee (PCS) met at 8A on Tuesday, April 3, with 31 members and 43 guests in attendance.

II. APPROVAL OF MINUTES

The minutes of the November 8, 1984, PCS Meeting were approved as mailed.

III. CHAIRMAN'S REMARKS

Bill Henning has assumed Chairmanship of the Working Group on Loss Tolerance and Measurement.

New PCS members added since the last meeting are J. W. Mathews, Baltimore Gas and Electric; D. H. Douglas, Cleveland Electric Illuminating; and Dr. W. D. Lampe, ASEA Transformers.

Project Authorization Requests (PARS) have been submitted for a telephone influence factor test and for a guide for failure investigation and analysis. No IEEE action has been taken yet.

Liaison with C57.12.4 Subcommittee concerning P262E.1 and P462C (No-load Loss Temperature Correction) was requested and established.

By action of the Administrative Subcommittee, the Working Group on Through Fault Duration Guide has been officially disbanded.

Following the meeting, four people asked to be added to the PCS:

Jerry L. Corkran - RTE
Robert E. Lee - Pennsylvania Power & Light Co.
Michael Mitelman - RTE
Dan Perco - Westinghouse Canada

IV. AGENDA

The agenda was accepted as proposed.

V. WORKING GROUP (WG) REPORTS

1. WG on Harmonic Load Current Heating - W. J. McNutt, Chairman

The WG met at 3P on Monday, April 2, 1984, with 11 members and 16 guests present.

Preliminary results of the joint WG and PCS ballot on C57.110/D4 (Recommended Practice for Establishing Transformer Capability When Supplying Nonsinusoidal Load Currents) were discussed. Changes were made to clarify the wording and to make the assumptions somewhat less conservative. The present 50 MVA scope limit was retained. After additional ballots are received, a 5th draft will be prepared for WG and PCS consideration.

The Task Force on Semiconductor Rectifier Transformers met on Monday; Chairman George Bryant reports continued progress on a draft document.

2. WG on Transformer Reliability - H. F. Light, Chairman

Tx Com Ballot
to be balloted again
before next meeting

The WG met at 1P on Monday, April 2, 1984, with 14 members and 11 guests present.

The WG has received direction from the IEEE Standards Review Committee regarding legal issues associated with the Reliability Guide. Their recommendation is to proceed using the established IEEE voting procedures. Any unresolved negative ballots concerning legal issues would be handled by the IEEE Standards Boards.

A 6th draft of the Guide has been prepared and will be balloted prior to the next meeting.

Len Stensland suggested the WG review IEEE 500, Reliability Data, for applicability to the Guide.

3. WG on Qualification of Transformers for Class 1E Application in Nuclear Power Stations - L. R. Stensland, Chairman

The WG met at 10:15A on Monday, April 2, 1984, with 6 members present. Comments received on draft 13 (P638/D13) ballot of the NPEC SC-2 committee were discussed. Before the next draft is issued, we will try to resolve those comments that could result in a negative vote.

4. WG on Transformers Connected to Generators - D. A. Yannucci, Chairman

The WG met at 1P on Monday, April 2, 1984, with 8 members and 4 guests present.

Still reviewing in W/G

Revision of Draft 3 of the Guide continues with most of the attention focused on Section 5 dealing with the selection of the parameters of the unit and unit auxiliary transformers.

Generator capability curves were discussed at the PCS meeting.

5. WG on Failure Analysis - D. J. Cash, Chairman

This new WG met for the first time at 10:15A on Monday, April 2, 1984, with 16 members and 15 guests present.

Preliminary Guide - to be balloted with W/G plan to adopt at Sept meeting

Discussion focused on the reasons for establishing a Guide for failure investigation and analysis. Copies of suggested outlines of content were distributed.

A Task Force has been formed to begin formulation of the guide; they will meet prior to the next meeting.

6. WG on Loss Tolerance and Measurement - W. R. Henning, Chairman

The WG met at 8A on Monday, April 2, 1984, with 10 members and 14 guests present.

Guide for Loss measurement - mostly tutorial

The Transformers Committee ballot on P262E/D5 (Correction of Load Loss and Impedance Voltage Measurements) was discussed. An improved presentation of the correction method was developed. The approximate formula will be retained with proper reference to its limitations and note defining the exact formula.

The Transformers Committee ballot on P262E.2/D6 (Voltmeter Connection for No-load Loss Measurement) was discussed. The negative responses focused on the clarity of the material. The proposal will be re-written so that it emphasizes the concepts of voltmeter connection, not detailed connection diagrams.

Because of the large number of measurement issues that exist, the WG will consider development of a loss measurement guide.

There was insufficient time at the WG meeting to discuss P462C/D3 and P262E.1/D3 (No Load Loss Reference Temperature and Temperature Correction). This subject was addressed at the PCS meeting. After much discussion, the WG was directed to develop a proposal based on the following:

1. An ambient reference temperature
2. A temperature range (as measured by top oil temperature) for which no correction would be made
3. Allowance of a correction if the temperature is outside the range.

VI. PROJECT REPORTS

1. The Short Circuit Duration Guide is being balloted by C57.

2. The Transformer Committee ballot results on P462D/D4 (Ratio Tolerance) were presented to the PCS. The negative ballots focused on the clarity of the wording. After much discussion, Michael Mitelman agreed to revise the wording in collaboration with L. S. McCormick and re-ballot the Transformers Committee.

3. Telephone Influence Factor Test - no report.

VII. OLD BUSINESS

1. John Dutton indicated that he felt that the revision of 4.1.6.1 of C57.12.00 was complete. This was subsequently confirmed after the meeting.

VIII. NEW BUSINESS

There was no new business.

IX. NEXT MEETING

The next meeting will be held on October 16, 1984, in Boston. The meeting was adjourned at 9:45A.

John D. Borst
Chairman

Attachment

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ksh

Recognition and Awards - W. J. McNutt

Responsibility in this area passed from Leonard Long to me since the last meeting. Leonard had submitted three candidates for the following awards:

PES Prize Paper Award
Working Group Recognition Award - Report Paper
Working Group Recognition Award - New Standard or Guide

Our nominee for PES Prize Paper Award, "Evaluation of a Functional Life Test Model for Power Transformers," by W. J. McNutt and G. H. Kaufmann, will receive one of two awards. Our nominee for Working Group Recognition Award based on a Report Paper published in the IEEE Transactions was the Working Group on Preparation of a Loading Guide for Transformers Rated in Excess of 100 MVA. Their report placed second in the voting, which does not rate an award, but it may be resubmitted at the end of this year.

I would appreciate receiving inputs from anyone on deserving candidates for these awards in future years. (Also nominees for a Distinguished Service Recognition Award would be welcomed.)

APPENDIX 1M

PAPERS FOR POWER GROUP MEETINGS

D. A. YANNUCCI

1984 IEEE/PES Overhead and Underground Transmission and Distribution Meeting

April 29 - May 4

Kansas City

There were a total of eleven (11) papers reviewed for this meeting. All papers were accepted. This was permitted by the paper committee due to the lack of papers submitted. There will be three (3) transformer sessions. The times of the session are Monday afternoon, Tuesday afternoon, and Thursday morning.

1984 IEEE Summer Meeting

There are a total of fourteen (14) papers being reviewed. To date reviews on seven (7) papers have been completed with four (4) papers being accepted to date. We will have a quota of seven (7) papers. Thus we will have two transformer sessions at this meeting.

IEC TRANSFORMER ACTIVITIES
3/23/84

1. The US was represented at sessions of IEC Technical Committees 14, 14B, and 14C at the Tokyo General Meeting in October 1983. The delegation of (4) included:

   J. C. Dutton, Chairman
   R. G. Hansen, NEMA
   R. L. Ensign, Southern California Edison
   E. Yasuda, Bonneville Power Administration

   a. Detailed reports of these meetings were prepared by J. C. Dutton and R. G. Hansen

   b. One important conclusion (previously reached, but now confirmed) is that attendance and participation are essential in advancing US ideas and proposals in IEC standards work.

2. Significant IEC transformer activities in progress include:

   a. Revision of Transformer Loading Guide IEC 354. J. Aubin of Canada is Chmn. of the Revising Subcommittee, which just held a meeting (March 15 & 16, 1984) in France. C. J. McMillen is a member of the Subcommittee.

   b. Revision of IEC Load-Tap-Changing Documents 214 & 542.

   c. Revision of IEC Reactor Standard 289/

   d. Work to revise IEC 76.

   e. Transformer and reactor sound levels.

   f. External clearances in air for power transformers.

   g. Investigation of dielectric stresses imposed by steep-fronted transient voltages generated within SF_6 switchgear.

3. IEC is discussing a proposal to introduce a new class of "Provisional Standards" aiming at accelerating the work of the IEC.

John C. Dutton

John C. Dutton
US Technical Advisor to
IEC TC 14 & 14B

APPENDIX IN

C57.12.2 - C. P. Kappeler

The ANSI C57.12.2 Subcommittee has not met since my last report, but is scheduled to meet in Kansas City on May 4. Work has continued on revision of C57.12.20 through .23 at the working group level. C57.12.25 final draft will be reviewed at the next meeting and C57.12.26 is at the printer.

A Joint C57/37 committee has been formed to define cabinet security, and a first draft prepared for review March 9, 1984.

I have no other action to report.

C57.15 - A. C. Wurdack

Subcommittee C57.15 has not held a meeting during the last six months, and a meeting is not scheduled in the near future.

C62 - E. J. Yasuda

My Liaison Report on the ANSI C62 and the SPDC activities submitted for the November 1983 Transformer Committee Meeting is still current. I am, therefore, not submitting any Liaison Report for the April 1-4, 1984 Transformer Committee meeting in Vancouver.

C68 - L. S. McCormick

During the last six months, I have not been made aware of any activity within the ANSI C68 Committee on Techniques for Dielectric Tests. Therefore, I do not have anything to report.

C76 - N. J. Melton

There has been no activity to report.

C89 - S .J. Antalis

No ANSI C89 meeting was held since the last report.

ANSI C89.1 - Machine Tool & Control Transformer -- In Committee Review for re-affirmation.

ANSI C89.2 - General Purpose Transformers -- In Committee Review for removal of all high voltage (1.2 kV) references. (To avoid conflict with new ANSI C57 Dry Type Distribution Voltage Standards.)

LIAISON REPORTS

(Advanced Copy)

IEEE/NPEC - L. R. Stensland

The Working Group for Qualification of Class 1E Transformers for Nuclear Power Generating Stations issued Draft 13 (dated January 23, 1984) of P638 to the IEEE/NPEC/SC-2 for ballot.

I have not received the notes of their last meeting, but I understand that the next meeting is scheduled for March 28 and 29, 1984 in Alburquerque, New Mexico.

HVAC - E. J. Huber

National Electrical Code - Liaison Report

The 1984 Natial Electrical Code is now published and, in effect, it is already time to think about proposals to be considered for the next (1987) code.

In order to be considered for inclusion in the 1987 National Electrical Code, it is necessary that proposals be submitted to the National Fire Protection Association so that they will be received by November 23, 1984.

Proposals should be sent to:

National Fire Protection Association
Batterymarch Park
Quincy, Massachusetts 02269

STATUS OF IEEE AND ANSI C57 BALLOTS, AND PRINTING

2/16

ANSI C57 BALLOT NO. OR IEEE PROJ. NO.	BRIEF DESCRIPTION	IEEE STD BD SUBM.	ANSI C57 COMM SUBM.	PUB. REV.	ANSI BSR SUBM.	EDIT TYPE SET	PR
P353	HVACC, C57.12.55, Dry Type	N/A	Rebltg. (Neg. Vote)				
P356	HVACC, C57.13.2, Inst. Tr.		C		~~To Be~~ Subm.		
P65	ANSI/IEEE C57.12.56-198X Dry-Type Insul. Testing (Models) (Formerly known as IEEE 65)	C	C		Sched. To BSR By 4/30/84		
P93	ANSI/IEEE C57.98-1982 Impulse Test Guide	C	C		~~To Be~~ Subm. To ANSI BSR		
P784	ANSI/IEEE C57.109 Short-Circuit Duration	C	To Be Bltd.				
P756	Trial Use Loading Guide 100+ MVA	C	See Note Below				

Note - Recent IEEE info lists this as an available trial-use standard IEEE - 756. Thus - it will not be balloted by ANSI at this time, and will not be reported further until balloted by ANSI C57.

Subm. = Submitted Bltg. = Balloting IP = In Process C = Complete N/A = Not Applicable

John C. Dutton

John C. Dutton, Chairman - IEEE Delegation to ANSI C57
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cc: SI Sherr, B Stanleigh, M Goulding, F Huber, WJ McNutt, ✓LJ Savio, DA Yannucci, OR Compton, RL Smith, TL Mayes, BF Allen, CH White, R Hansen, C. Zegars, V. Morgan, LW Long, R Uptegraff, R. Ensign