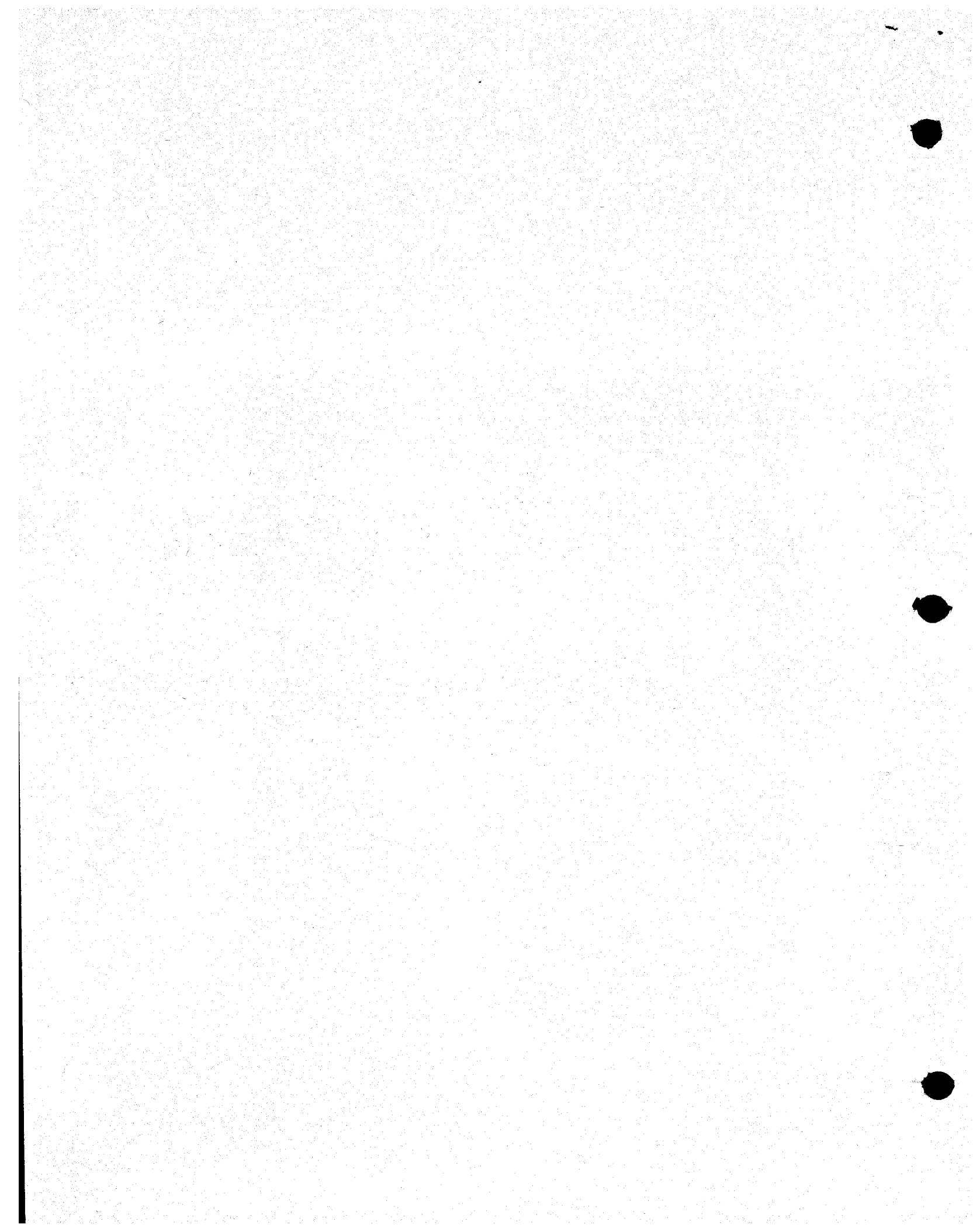


OCT 18 1981

IEEE TRANSFORMERS COMMITTEE

MINUTES OF APRIL 1, 1981

PORTLAND, OREGON



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MEMBERS OR REPRESENTATIVES PRESENT

W. J. McNutt, Chairman	D. C. Johnson
D. A. Yannucci, Secretary	O. Keller
B. F. Allen	J. J. Kelly
D. J. Allen	T. S. Lauber
R. Allustiarti	R. E. Liebich
E. H. Arjeski	H. Light
P. L. Bellaschi	C. Lipsday
J. V. Bonucchi	T. Lipscomb
J. D. Borst (rep. by D. Takach)	L. W. Long
G. H. Bowers	R. Lowe
D. J. Cash	M. L. Manning
E. Chitwood	J. W. Mathews
J. L. Corkran	C. H. Millian
F. W. Cook	L. S. McCormick
D. Crofts	G. McCrae
M. G. Daniels	C. J. McMillen
R. C. Degeneff	N. J. Melton
J. Dind	C. K. Miller
J. Doellas	R. E. Minkwitz
J. Dutton	C. Mitchell
J. K. Easley	H. P. Moser (rep. by D. Barnard)
J. A. Ebert	R. J. Musil
E. C. Edwards	W. H. Mutschuer Jr.
C. Gerald Evans	D. A. Natrass
W. R. Farber	E. T. Norton
M. Frydman	R. A. Olsson
H. E. Gabel	J. H. Otterangers
C. M. Gardham	D. A. Roach
D. A. Gillies	R. L. Schmid
W. F. Griffard	L. R. Smith
R. L. Grubb	J. W. Spencer
G. Gunnels	W. Stein
G. Hall	L. R. Stensland
J. L. Harbell (rep. by P. Birke)	F. Thumason
T. K. Hawkins	T. P. Traub
F. W. Heinrichs	E. F. Troy
C. Hendrickson	D. Truax
K. R. Highton	R. E. Uptegraff
C. C. Honey	S. G. Vargo
E. J. Huber	R. A. Veitch
C. Hurty	C. R. Willmore
G. W. Iliff	W. E. Wrenn
R. G. Jacobsen	Z. Zepic

MEMBERS ABSENT

L. Savio, Vice Chairman	C. P. Cappelar
E. J. Adolphson	R. B. Kaufman
L. C. Aicher	E. J. Kelly
R. J. Alton	A. D. Kline
S. J. Antalis	D. E. Massey
J. C. Arnold	H. B. Margolis
G. M. Bell	S. P. Mehta
S. Bennon	H. P. Mosher
J. Bergeron	R. A. Nelson
J. H. Blake	J. R. Newton
F. Brutt	L. L. Preston
D. F. Buchanan	B. E. Smith
O. Compton	R. B. Stetson
J. Corckran	F. R. Stuckum
D. H. Douglas	A. L. Tanton
D. A. Duckett	R. C. Thomas
P. Falkowski	T. P. Traub
H. G. Fischer	F. J. Vogel
S. L. Foster	J. P. Vora
A. W. Goldman	J. W. Walton
J. C. Gorub	R. J. Whearty
J. J. Herrera	S. A. Wiencek
E. Hook	J. Woodall
E. T. Jauch	A. Wurdacil

GUESTS

H. W. Anderl	P. Jonnatti
R. Bancroft	J. Janetti
C. V. Brown	E. Koenig
J. Brunke	H. Lampe
K. W. Doughty	J. McGill
J. Daleon	L. Miller
D. J. Fallon	L. M. Nicholas
J. Galbraith	J. L. Puri
R. L. Brumert	L. A. Spragins
C. K. Hale	V. Thenappan
J. R. Hickman	G. Zguris
P. J. Hoefler	

1. Chairman's Remarks and Announcements

Mr. McNutt convened the meeting at 8:30 a.m. and welcomed members and guests in attendance. He expressed his thanks to George Iliff who hosted the meeting. He also thanked John Galbraith, John Brunke, and Diane Woods who aided George in providing the excellent meeting arrangements.

Members and Guests introduced themselves.

The Chairman introduced Loyd Spragins from NEMA who is the new secretary of ANSI C57 who is replacing Charlie Willmore. It was also announced that there were 143 registrants for the meeting.

2. Approval of Minutes of October 29, 1980

The minutes with the corrections indicated below were approved.

Corrections: 1. Page 4, paragraph 2.4 - The word impulse is misspelled.

With that correction noted, the minutes were approved.

3. Report of the Administrative Subcommittee - W. J. McNutt

The Administrative Subcommittee met at 7:00 PM on Monday evening, March 30, 1981.

I. Membership

By action of the Administrative Subcommittee invitations to membership in the Transformers Committee were extended to:

no longer
AEP
employee

Maurice Frydman	-	AEP
Ed Huber	-	Underwriters Laboratories
David Takach	-	Westinghouse
Fred W. Thomason	-	TVA

Following our last meeting a Membership Application form was prepared by Leo Savio and appeared with the Minutes of the Milwaukee meeting. This form will be expanded by Dean Yannucci to include a listing of the eligibility requirements and will be placed in the hands of the Subcommittee Chairman.

We need to update all of our membership lists, so Working Group and Subcommittee Chairmen are asked to perform that task as soon after this meeting as possible. They should distribute these lists to their membership, with a copy to Dean Yannucci, Leo Savio, and myself. Dean will update the main Transformers Committee list.

II. Subcommittee Activities

Richard Liebich of United Engineers in Philadelphia was welcomed as the new Chairman of the Audible Sound and Vibration Subcommittee. He fills a position which was vacant for almost two years.

A new Working Group on Harmonic Load Current Heating of Transformers within the Performance Characteristics Subcommittee was approved. Their activities will be reported later today.

Peter Bellaschi submitted a proposal for Insulation Levels for 1200 KV Power Transformers, which was assigned to the Dielectric Tests Subcommittee with the suggestion that a means of publication be explored as a "Recommended Practice for Future Designs".

III. Liaison Activities

Richard Liebich has been given two liaison assignments:

ANSI S-1 Committee - Acoustics

IEC TC14/WG 20 (Measurement of Transformer and Reactor Sound Levels)

Joe Bonucchi will replace Saul Bennon as a member of the TOD Long Range Planning Committee.

L. S. McCormick will serve as the initial contact for liaison with Subcommittee 4 of ANSI C63, who will be preparing a new version of C63.8 on Measurement of Partial Discharges.

IV. Papers for Power Group Meetings

Leo Savio reported that 16 papers are under review for the 1981 Summer Power Meeting and 3 sessions have been scheduled on Monday and Tuesday, July 27 and 28.

Declarations of Intent have been received for 21 transformer papers for the 1981 T&D conference in September.

V. Future Transformer Committee Meetings

Ed Adolphson submitted a report that he had netted + \$340 from the Milwaukee meeting, which will be carried forward for future meetings. The schedule of future meetings is as follows:

October 18-21, 1981	Adams Hotel Phoenix, Arizona Host: Mr. C. Hendrickson
March 29-31, 1982	Amfac Hotel Airport Marina Los Angeles, California Host: Mr. C. Hurty
October 24-27, 1981	Holiday Inn - Center City Philadelphia, PA Host: Mr. R. Wearty
April 10-13, 1983	Peach Tree Plaza Atlanta, Georgia Host: Mr. G. Evans
November 7-9, 1983	Hyatt Regency Dearborn Detroit, Michigan Host: Mr. D. Cash
April 1984	Vancouver, B.C. Host: Mr. G. McRae
Fall 1984	Boston, Massachusetts Host: Mr. R. Minkwitz

A tutorial symposium on "Thermal Evolution of Gas Bubbles from Transformer Insulation", organized by Dave Douglas, was held at this meeting and two future symposia have been scheduled.

- October 1981 - "System and Transformer Transient Voltage Interaction" to be organized by Bob Degeneff.
- March 1982 - "Techniques and Problems In Measuring Transformer Losses" to be organized by Sam Mehta.

VI. TOD Activities

The Technical Operations Department met on Monday evening, February 2, 1981 at the Winter Power Meeting in Atlanta. Items of note are as follows:

1. ADCOM has established a Committee on Social Implications of Technology, which will report to ADCOM. They may address their mission through joint sessions with other technical societies (ASME, ASCE, etc.). Each technical committee within PES has been asked to supply one representative. I have appointed Dean Yannucci to this position and propose that this be a continuing duty of the Secretary as long as the committee is active. The chairman and vice-chairman already have standing committee assignments which help broaden their exposure to activities within PES.
2. TOD approved the favorable recommendations of a special Task Force set up to study an NRC proposal that IEEE develop and implement an accreditation program for laboratories involved in environmental testing of safety-related equipment for nuclear generating stations. TOD recommended that ADCOM establish an ad hoc committee to develop plans for the accreditation program. The ad hoc committee should also explore the financial and legal aspects of such a program. Tentative approval was given for implementation subject to final review of the ad hoc committee findings by ADCOM and TOD.
3. At the 1980 Summer Power Meeting, ADCOM instructed TOD to investigate and comment on possible educational programs aimed at high schools to inform the students on the true story of nuclear power and other energy forms. The Power Engineering Education Committee has researched the documentation and programs available and is preparing a report. This report will contain a complete bibliography of available educational material, a list of groups having a similar interest as IEEE, who would gladly cooperate with IEEE, and suggest a procedure by which the IEEE Sections/Chapters can get information and speakers to get our story over to the students. The report will be completed in several weeks and will be sent to Adcom shortly.
4. The revision to the Technical Sessions Guide has been completed by the Technical Sessions Improvement Committee and has been approved by TOD. It will now be sent to Mr. Bill Peace, Chairman of the Publications Department, for comment and implementation.

VII. Transformers Committee Operating Manual

Joe Bonucchi distributed draft copies of a new operating manual and all members of the Administrative Subcommittee were requested to submit comments by July 1. This manual should be available for distribution to the membership by our next meeting.

3.1 Audible Sound & Vibration - R. E. Liebich

Eleven members and five guests attended the Meeting of the Audible Sound and Vibration Sub-Committee in Portland, Oregon on March 31, 1981.

The new Sub-Committee Chairman stated his commitment to coordinate and stimulate a revitalization of the Sub-Committee activities. All existing members will be canvassed by questionnaire letters within the next month to determine their individual willingness to participate in Working Group projects and to encourage nomination of new members, consultants and liaison representatives for participation in Working Group activities.

Seven potential Working Group projects were discussed, of which three were adopted for immediate submission to the Transformers Committee for approval; three others will be developed further by the Sub-Committee Chairman for possible later submission, and one was dropped.

The three Working Group projects to be formally submitted immediately to the Transformers Committee are:

1. A Working Group project to review previous Sub-Committee members objections to the new ANSI C57 12.90 and C57 12.21 standards and to propose updates to these standards, as they are deemed desirable;
2. A Working Group project to perform liaison with the IEC TC14, Working Group 20, as well as other pertinent organizations, such as the ASME, ISA, and IEEE Station Design Committee;
3. A Working Group project to develop guidelines for calculation of far-field noise spectra. This task includes development of equivalent sound power spectra for transformers. Mr. Lennert Swenson, BPA, was appointed by the Sub-Committee Chairman to be Chairman of this Working Group, pending approval by the Transformers Committee Chairman.

The three Working Group projects to be developed further by the Sub-Committee Chairman for possible later approval by the Transformers Committee are:

1. A Working Group project to review currently available practical noise-control methods and their relative effectiveness. This task includes development of far-field test standards or guidelines.
2. A Working Group project to review noise-limit criteria presently in use by some major users, as general guidelines for other engineers.
3. A Working Group project to review community-response estimation techniques presently in use by some major users. This task would include development of guidelines for calculation of audibility and annoyance.

3.1

The Working Group project dropped was the development of performance specifications for instrumentation to be used for measurement of individual core tones. It was concluded by the members present that de facto standardization of appropriate instrumentation and techniques is already being achieved by the foremost electro-acoustical instrumentation manufacturers.

A list of proposed new Sub-Committee members, and Working Group Chairmen and members, will be submitted to the Transformers Committee Chairman, for approval to receive individual letters of invitation from the Sub-Committee Chairman.

3.2 Report of Bushing Subcommittee - J. K. Easley

The Bushing Subcommittee met Tuesday, March 31 with 10 members and 15 guests present.

The Working Group on a Guide for Loading Bushings reported the recent ballot on Project P757-Guide for Loading Power Apparatus Bushings has been closed successfully. There were no negative votes. At the W.G. meeting on Monday 17 comments were reviewed without substantive change. D. C. Johnson and J. L. Puri agreed to review the editorial insertion of the resolved comments so that the Bushing Loading Guide may be forwarded to the Standards Board promptly.

A negative ballot on Project P24, Revision of ANSI C76.2 was discussed at some length. As a result an improvement was evolved. The explanatory notes of Table 9-Partial Discharge were revised in such a way that the original intentions of the subcommittee are expressed more clearly. This ballot is now successfully closed so this project is ready to be forwarded to the Standards Board.

The effect of transformer oil level upon bushing temperature was discussed briefly. The Ad Hoc Committee assigned to this work was encouraged to submit a proposal before the next meeting.

ANSI C76.1 General Requirements and Test Procedures for Outdoor Apparatus Bushings was issued in 1976 so a review is required promptly. A preliminary list of suggested revisions was distributed to those present. All members of the subcommittee and interested guests were requested to review this list and forward comments and/or additional input to N. J. Melton.

3.3 Dielectric Tests Subcommittee - L. S. McCormick

The Dielectric Test Subcommittee met at 8:00 a.m. with 33 members and 25 guests in attendance.

The minutes of the meeting in Milwaukee were approved as they had been published.

After a few brief comments by the chairman, the Working Group reports were given as follows:

Working Group on Partial Discharge Tests on Transformers

Mr. Z. Zepic reported that this Working Group now has two task forces in effect. One task force is studying the apparent charge detection of a partial discharge, and the second task force is studying the acoustics method of detection. However, these task forces have been inactive since the last meeting because of changes in responsibility of their chairmen.

Mr. Zepic has assumed the temporary chairmanship of the task force on apparent charge detection and he requested that the members of the Working Group submit to him their preferred methods of measuring partial discharge by 7/31/81. These preferred measuring circuits will form a base of discussion at the next meeting. The intent of this is to collect data to correlate the measurements of RIV and apparent charge.

Working Group on Resonant Overvoltages in EHV Transformers

R. Degeneff reported that their meeting was spent discussing several recent papers on resonant overvoltages and transformer response to system switching voltages. The consensus of the group on these subjects is as follows:

1. Fast front switching surge voltages of sufficient magnitude to cause internal transformer damage may exist but have not been observed in field tests or calculations.
2. It appears that oscillating waveforms are much more dangerous to the insulation integrity of a transformer, but even so the probability of damage is extremely small.
3. The Working Group feels that it is to a point where it can recommend to the subcommittee that this problem is well understood and does not recommend a change in impulse testing procedure.
4. The Working Group will present an update and tutorial of the results of its studies over the last ten years at the Phoenix meeting. The proposed outline for this tutorial is as follows: background - transformer response - system response - transformer/system interaction - conclusions - recommendations.

Working Group on Dielectric Tests for HVDC Stressed Transformers and Reactors

Mr. C. Hurdy reported that the entire meeting was used to discuss the remaining area of controversy in their Working Group report that is being prepared. This controversy concerns the connections and levels of impulse tests on rectifier/inverter connected windings.

Based on information supplied by Transformer Union on chopped surge waveshapes and recommendations from General Electric Company, they have agreed on the following test procedure:

- A. Full wave and chopped wave lightning impulse surges must be applied to each end of the rectifier winding with the other end grounded.
- B. Switching impulses shall be applied to the rectifier windings with the terminals tied together.
- C. Crest voltage levels for full and chopped lightning impulse wave are to be equal in magnitude, and all test values are to be a minimum of 25% above the arrester protection levels.

The report in a final form will be balloted once more within the Working Group.

Working Group on Revision of Dielectric Test of Distribution Transformers

Mr. Bill Farber reported that they had conducted an extra meeting during the winter general meeting in Atlanta; and at their meeting in Portland they continued their work on preparing a paper on mandatory impulse tests on distribution transformers. There will also be, as a consequence, a reduction in low frequency test levels. It is planned to present this paper at the 1982 winter general meeting in order to elicit comment and discussion on the proposal before proceeding to recommend changes in the appropriate standards.

A project authorization request form has been submitted to support this work.

Working Group on Revision of Dielectric Tests

Mr. George Iliff, acting chairman of this group, reported on the status of C57.12.14 which is the dielectric test proposal for 115 kV and 230 kV transformers. It was reported at the previous meeting that there were 23 negative ballots to be resolved. Mr. Iliff reported at this meeting that all but six of these negative ballots had been resolved. The results of the balloting are now as follows: There are 81 approvals, 27 not voting, 1 not returned and 6 negative. Four of the six negative ballots are from one company and concern the complete philosophy of the ballot and thus, it is felt that these four negative ballots will not be resolved and that the document should be submitted to the Standard Boards even though these four negatives remain. One negative ballot concerns the low BILs that are being used for 115 kV and 230 kV. The last negative ballot concerns the scope of the document. The Working Group felt that these ballots could be resolved by taking them as separate items and sending them back to the Working Group to be discussed and resolved.

During discussion of these results in the subcommittee, it was discovered that there was another area of controversy that needs to be cleared. Therefore, an additional letter will be sent to the members of the transformer committee for their comments to resolve this question. This question concerns the definition of the term coefficient of grounding.

During the Working Group meeting, a task force consisting of approximately six people was formed to study and begin work on the task of melting the trial use document, 262B, into the existing standard C57.12.00.

The task force on the impulse test guide revision still has negative ballots to resolve and will attempt to clear these before our next meeting in Phoenix.

The task force on revision of dielectric testing of shunt reactors reported that no work had been done since the last meeting in Milwaukee.

This ends the reports of the Working Groups.

During discussion at the subcommittee, consideration was given to how to handle test levels for 1200 kV systems. No definite conclusions were reached. This matter will be discussed with Mr. Adolphson, chairman of the Working Group on dielectric tests and with Mr. Ballaschi and some type of recommendation made at the next meeting. The meeting was adjourned at 9:45 a.m.

3.4 Dry Type Transformer Subcommittee - B. F. Allen

The Dry-Type Transformer Subcommittee met at 1 p.m., March 31, 1981, with 10 members and 14 guests present.

The following is a summary of the W.G. reports:

The W.G. on Standards for Dry-Type Transformers Incorporating Solid Resin-Encapsulated Coils chaired by Ed Huber met with 13 members and 9 guests present. The results of a W.G. ballot covering the proposed name and scope were discussed. The comments suggested that both the W.G. name and the scope be expanded to include the word "cast" and that the scope specifically mention that either one or both windings might have solid encapsulated construction. The feeling at the meeting was that the name should not be changed because it would become too unwieldy. It was agreed that the objectives can be achieved by changes in the scope statement and this will be done. Two key points emerged from a general discussion of characteristics. The need for adequate definitions and need to limit standards revisions or additions to performance-related items wherever possible. A Project Authorization Request will be made up and submitted to cover a review and necessary changes in C57.12.01, "General Requirements for Dry-Type Distribution and Power Transformers." This will cover things such as: additional definitions, added insulation system temperature classes, etc. Subsequently, the other documents such as the Test Code, etc., will be examined. Future project requests will be submitted as needed.

The Thermal Evaluation W.G. chaired by George Bowers met with 8 members and 7 guests present. Since the meeting in Milwaukee, the effort to resolve negative ballots and comments resulting from the Transformers Committee Ballot of Draft #13 of the proposed IEEE-65 has gone forward. Changes resulting from this ballot have been incorporated in Draft #13A and have been mailed to those who returned a ballot. A limited time has been allowed for further comment; we sincerely hope that these changes will be acceptable. Assuming no further comment is received, Draft #13A will be forwarded to the Standards Board.

The Dielectric Problems W.G. chaired by Don Kline met with 7 members and 11 guests present. Partial discharge testing was discussed, particularly in regard to the need for input from users. There has been no further progress on the Winding Transient Voltage Analysis Guide. Due to limits on available time to devote to this activity, Mr. Kline has resigned his chairmanship of this W.G. I appreciate and wish to thank him for his efforts in this activity. A new W.G. chairman will be recruited prior to the next meeting.

The Loading Guide C57.96 Revision W.G. chaired by Bill Mutschler met with 9 members and 9 guests present. The constants for Arrhenius curves on which the Loading Guide is based were discussed. The time-temperature-load equations were also discussed. It was agreed a confidential ballot on both subjects would be sent to interested parties for return to Mel Manning for tabulation and presentation at the next meeting. An analysis of the concept of relative aging by Mr. Uptegraff had been circulated to W.G. members. The W.G. reaffirmed their decision that the Loading Guide should continue to be based on relative aging. It would be very helpful to this W.G. if users who have used the existing Loading Guide would send Mr. Mutschler any comments they have.

The remaining two W.G.'s did not meet at this time.

3.5 Instrument Transformers Subcommittee - Ray Smith for R. C. Thomas

The Instrument Transformer Sub-Committee met in Chattanooga, Tennessee on March 23, 1981 and March 24, 1981.

The Sub-Committee wishes to assign a C57.13 identity, i.e. C57.13.3, to a guide the Power Systems Relay Committee is developing under project P860 Grounding of Instrument Transformer Secondary Circuits and Cases.

The Sub-Committee recommended that the January 12, 1980 draft of C57.13.2 Conformance Test Procedures for Instrument Transformers be submitted to concurrent letter ballot of the Sub-Committee and the Transformer Committee.

The Sub-Committee expressed a desire to accept, as inputs to the C57.13 revision, material offered by the NEMA Technical Committee (on I.T.'s) covering radio influence voltage testing of instrument transformers fusing of voltage transformers, and care and operation of instrument transformers.

The Sub-Committee recommended that dimensional material such as now covered in C12.11 be issued under C57.13.x designations, after development by the NEMA Technical Committee and with close liason with C12. (The material covers requirements for transformers used for revenue metering). The Sub-Committee requested that the Administrative Sub-Committee consider the proper outlet for such material, C12 or C57.13.

The Sub-Committee, which has the responsibility for preparing a revision of C57.13, considered a large number of items pertinent to revision, proposing some changes and requiring additional investigation of other subjects.

A discussion was initiated by C. Honey in which he questioned whether the NEMA material should be used for RIV testing for instrument transformers independent of the user. W. McNutt made the point that the material by NEMA would be used as input into the subcommittee work and would have the benefit of user comments.

3.6 Insulation Life Subcommittee - C. McMillen

The Insulation Life Subcommittee met yesterday morning with an attendance of 19 members and 32 guests, a total of 51, attendees. All three Working Groups reported on their progress since our meeting last Fall.

The first Working Group reporting was the Working Group on Loading Guides. Chairman Ron Olsson reported as follows:

Their meeting Monday had 42 attendees, composed of 23 members and 19 guests. Two new members were added to the Working Group; namely, James Spencer of Trench Electric, Ltd., Scarborough, Ontario, Canada; and John Brunke of Bonneville Power Administration, Portland, Oregon.

Reported was that revisions of Loading Guides C57.91 and C57.92 are ready for galley proofing. C57.91, the Distribution Transformer Guide, will have its galley proof printed and ready for proof reading by Jan Ottevangers and Ron Olsson about a week from now. C57.92, the Power Transformer Loading Guide for Ratings 100 mVA and Below, won't be ready for proof reading until this Summer, unfortunately, due to a foul-up at IEEE. Roger Kieren and Ron Olsson will proof read the latter document.

The status of other guides were as follows: Dave Douglas, Chairman of the Task Force preparing the new Guide for Loading Transformers Rated Above 100 mVA, reported that a position paper prepared by a Sub-Task Force of the members was presented at the most recent Winter Power Engineering Society Meeting at Atlanta. An excellent oral presentation was made by Charles Mitchell. Five written discussions were received and the closure is being completed at these meetings by Messrs. Douglas, McNutt, Mitchell, Gardam, and Ottevangers.

The status of the Above 100 mVA Guide is as follows: Through the extensive effort of Olin Compton, a third draft was issued to the Task Force members in advance of the meeting. Several suggested changes were discussed at the Monday meeting; the most important were in Section 2 of the main text to resolve disagreements over the proposed temperature limits and clarification of Appendix C, Examples of Calculating Transformer Loading Capability.

Bill Wrenn reported on his initial work of revision of C57.95, the Loading Guide for Step Voltage Regulators. A difference from our transformer guides is that two of the three manufacturers use a sealed tank system rated 55/65C rise, while the third makes a vented tank rated 55°C rise. Bill has sent his first draft to his Task Force members. In an attempt to obtain more help in the work of revision, he will send a copy to all members of the Loading Guide Working Group to familiarize them with the documents. He requests that volunteers come forward to help ease the workload.

At long last, we now have a knowledgeable volunteer to chair the Revision of the Current Limiting Reactor Loading Guide. He is a new member of this august Loading Guide Working Group, namely, James Spencer of Trench Electric, Ltd., of Scarborough, Ontario, Canada, a major manufacturer of those somewhat--to us transformer engineers--strange-looking and performing electrical apparatus. He is enthusiastic in tackling the job, and I am sure he will do a good job and hope you all will make Jim welcome and that some of you will join his Task Force. Here is an opportunity for anyone that may be getting bored with transformers and looking for something new and challenging. This apparatus is made in both dry and oil-filled systems, so initially at least we will start working on dry-type and later oil-filled to establish similarities. This will, of course, necessitate liaison with the Dry-Type Subcommittee, and this has been done.

In closing, we want to remind members of Olin Compton's request for test data needed to check, or perhaps modify, transient temperature equations used in calculating aging and loading capability of distribution transformers. This is in preparation of a future revision of C57.91.

The next Working Group reporting was Thermal Tests, Chaired by Bob Veitch. Bob had 10 members and 19 guests present at his Monday meeting.

Bob reported on the results of the questionnaire the Working Group sent to manufacturers and users to determine their desires as to what was needed in the new "Recommended Procedure for Performing Overload Heat Run on Oil-Immersed Power Transformers." In summary, 65 percent of the Users queried plan to perform or to specify overload heat runs, 35 percent do not; while 100 percent of Manufacturers replied "yes," but some stated "...only on request." In regard to the question as to the intentions for performing the run, Users respond they wished to obtain confirmation of overload capability without gassing or other problems. Manufacturers replied their intention was to determine (1) thermal characteristics; (2) obtain design data; and (3) the same as users, verify capability and absence of gas generation. As to a standard profile: for Users, 44 percent would like one; and 55 percent want one tailored to their requirements. The Manufacturers responded 50/50. Also, 62 percent of users have a definite overload profile which represents actual or planned loading conditions; 38 percent do not. Finally, as to recommendation of peak load, 68 percent of users recommended a specific value. These ranged for maximums from 200 percent for ratings below 100 mVA, 187 percent for above 100 mVA, and 125 percent as a minimum peak. The majority, though, recommended 150 percent minimum peak or less. Manufacturers generally recommended a 150 percent peak, or loads that would limit hottest spot temperature to 140°C.

The Working Group, as a result of these responses, decided to expand the scope of the procedure to include a test procedure to demonstrate the thermal performance under specified overload conditions.

Under new business, the Working Group started to compare IEC and ANSI methods of performing heat runs on transformers with two axially disposed identical windings. In summary, IEC connects them in series, and the average temperature rise of the connected windings is measured by resistance change. ANSI practice is to shut down separately, to determine the average rise of each winding, with the requirement that the top, hotter winding meet the average rise guarantee.

Our third Working Group, Thermal Evaluation of Oil-Immersed Power and Distribution Transformers, met yesterday morning; but unfortunately its Chairman, Al Wurdack, was unable to attend, so members and guests had to be content with a substitute, namely yours truly.

Since Al wasn't there, we had no preliminary results of his balloting of Working Group and Subcommittee members on the reaffirmation of IEEE 345, the Standard Test Procedure for Thermal Evaluation of Oil-Immersed Distribution Transformers. Ballots are due April 20, so we urge all who haven't returned theirs yet to do so by that date.

Bob Grubb reported he is seeking members of a task force to look into the feasibility of adding gas analysis to this test procedure and accumulating reference data on the methods that may be used. He is planning to draft a suggested wording on recommended changes to 345 to recognize gas analysis.

Our thanks to Dave Douglas for organizing a very informative, stimulating Symposium on Bubble Evolution yesterday afternoon. The symposium enjoyed a large attendance. Our particular thanks to those who made it successful, the speakers. First, the manufacturers' representatives who performed or directed the tests: Dean Yannucci of Westinghouse; Bill McNutt of GE, who were funded by EPRI in part and whole, respectively; and Frank Heinrichs of McGraw Edison, who funded their own work; and finally, Dave Truax, of McGraw, who presented his proposal for risk analysis.

The speakers, who represented the Users, giving the other side of the problem were: Bob Whearty of Philadelphia Electric, Tom Traub of Commonwealth Edison Company, Clive Gardam of Toledo Edison Company, and Russ Minkowitz of New England Electric Company.

3.7 Insulating Fluids Subcommittee - H. A. Pearce

The Insulating Fluids Subcommittee met at the Thunderbird Jantzen Hotel in Portland, Oregon on March 30 and 31, 1981. There were 16 members and 12 guests present. The Subcommittee convened with Mr. Lipscomb acting as chairman in lieu of Mr. Pearce, who was unable to attend due to a back injury, and Mr. Frank Heinrichs acting as secretary.

Item 1. Minutes of 9/27-28/80 approved.

Item 2. P-799 Guide for Handling and Disposal of askarels.

Mr. Niemiec will serve as the EPA representative to assist the Subcommittee in this project. Mr. Niemiec summarized the current status of 40 CFR 761 regarding challenge by EDF of items in the regulation. This is reported in the Tuesday, March 10, 1981 Federal Register volume 46 number 46 (copies can be obtained by calling 800-424-9065). This decision, if upheld, may lower the present 50 PPM limit. A petition has been filed for an 18 month interim period (from February 1981) during which time an appeal of the previous litigation will be reconsidered by the court. Following are some noteworthy items receiving considerable discussion from the floor preceded by Mr. Niemiec's invitation to all to furnish official comments on this subject to the EPA via his office:

- a. In view of the unresolved question of a test method by which EPA can regulate the rule, the EPA agreed during the interim period to accept reasonable laboratory results from qualified laboratories using methods currently under consideration. During this time they will enforce the regulations as of May 31, 1979 (50 PPM level, etc.)
- b. Transformers with oil containing less than 500 PPM do not require labelling.
- c. The status of the Versar study on an approved test method is not known at this time.
- d. Some transformer users are measuring the PCB content on all transformers. Some equipment manufacturers are faced with customer specifications certifying various PCB contents on new equipment well below the March 1979 level. These and many other measures obviously designed for protection from an ill-defined law are tending to increase the burden on the industry. Furthermore, today's procedures may well be incorrect when the current situation is resolved.

Mr. Crofts registered a plea for the EPA to address the users' problems regarding compliance with the rule.

- e. An additional ASTM round robin is scheduled to compare ECD and Hall detector devices. The round robin on the proposed test method is to be reported and discussed at the ASTM D-27 meeting, June 8 in Hershey, PA.
- f. Methods are being considered for removing PCB from oils in batch type processes. Oil properties should be considered in those processes just as in other reclaiming procedures.
- g. Mr. Kelly reported on a presentation with expert witnesses to his congressman in an attempt to obtain relief from the Toxic Substance Control Act on the basis that "assumed" levels of toxicity with little or no verification were paralyzing the power industry. This presentation was a plea to provide the necessary research to properly establish toxicity. Mr. Kelly offered to make these comments available to anyone and encouraged others to join in similar efforts (J. J. Kelly, Transformer Consultants, P. O. Box 3575, Akron, Ohio 44310).

Discussion of the revised drafts of sections of the Guide: A fresh draft of the Scope, Introduction and Minimum Detectability was reviewed again and new changes suggested. The Subcommittee requested a review of the Introduction to confirm the accuracy of our statement of the requirements of 40 CFR 761 and after such a review and revision, this particular section should be sent to Mr. Pearce for approval and circulation. Mr. Morrison furnished a revision to the proposed ASTM test method. Mr. Kelly's section on labelling will be held up pending possible rule changes. Mr. Gillies presented an outline describing the tasks for developing his section on Disposal of Liquids and Solids. Mr. Gillies solicited and received guidance from the Subcommittee on a general philosophy for his section. Mr. Crofts suggested the possible need for a section on the reuse of contaminated fluids. Mr. Lipscomb suggested that the Guide should not contain the ASTM test verbatim.

Item 3. (Correspondence) Chairman Pearce's letter to ANI regarding proper interpretation of C 57.104 - 1978 (Combustible Gas Guide) produced a satisfactory response. Letter to be made part of the minutes of this meeting. The Subcommittee's request to Mr. Bonnucci regarding Mr. Niemiec's participation was obviously fruitful.

Item 4. Negative ballots on P 637 (Oil Reclamation Guide) were discussed. Major objections concerned the section on Energized Reclamation.

Revisions appropriate to those negatives were made. The negative balloters will be contacted to attempt resolution.

Mr. Mcrae recommended a CEA research report on oil reclaiming (RP77-70), which the members can obtain from CEA, Suite 580, Number 1 West Mount Square, Montreal PO, Canada H3Z2P9.

Item 5. Mr. Lipscomb reviewed a request to reconsider a previous decision by the Subcommittee to draft a Guide for Silicone fluids, and to include "other" fluids. Following a lively discussion the Subcommittee moved and carried the following successive motions:

- a. Create a Guide for Handling Silicone Fluids.
- b. Create a Working Group to accomplish (a).
- c. Expand the scope of the Working Group (b) to include Silicone and other High Fire Point fluids.
- d. Modify the scope of Working Group (b) to make a recommendation to the Subcommittee on the need for Guides on Individual Fluids or a Guide combining all types of fluids. The membership of the Working Group: Mr. Hoeffler, Mr. Mutchler, Mr. Dind, Mr. Frydman, Mr. Bryant, Mr. Hudis, Mr. Gillies.

Item 6. New business. Mr. Lipscomb reminded the membership at the request of adcom that absence of a member from two consecutive Transformer Committee meetings entitles the Committee to invite the individual to resign.

Mr. Morrison offered to inform the Subcommittee on the activities of IEC Group 10 sessions on analytical test methods that he will attend in Belgium.

Item 7. Adjourned 3/31/81.

3.8 Performance Characteristics Subcommittee - L. W. Long

The Performance Characteristics Subcommittee met March 31, 1981 at the Thunderbird Motor Inn at Portland, Oregon with 31 of 49 members present, one member represented, and 38 guests, totaling 70 attending. Four new members of the Subcommittee are W. R. Henning, E. J. Cham, L. R. Stensland, and Desmond Wright.

Minutes of the October 28, 1981 meeting in Milwaukee were approved.

The chairman announced that the Administrative Subcommittee yesterday approved the presentation of a tutorial on techniques and problems in measuring transformer losses for the spring 1982 convening of the Committee. S. P. Mehta proposed this tutorial to the chairman at the spring 1980 meeting, and Mr. Mehta will be asked to organize the tutorial.

Reports of Working Groups were received.

Working Group on Transformer Reliability

The Working Group met March 30 with 13 members and 20 guests present. A special task force had met in Philadelphia November 20-21, 1980 to prepare a document for combined ballot of the glossary of terms and formats for reporting population and failures. The results of the ballot in the Working Group were

Affirmative	24 (18 with comments)
Negative	<u>2</u>
Total Returned	26 -- 84%
Not Returned	<u>5</u>
Total Issued	31

Chairman Harold Light expects to convene the special task force within the next 6 weeks to prepare a complete guide (P786) for balloting in the Working Group and for simultaneously circulating to other organizations.

Working Group on Qualification of Transformers
for Class 1E Application in Nuclear Power Stations

The Working Group met March 30 with 2 members and 4 guests present to review negative ballots from NPEC SC-2 on Draft 10 of the type-test document being developed. Time did not permit completion of the review and a meeting to continue the work is planned before the next Transformers Committee meeting.

Chairman Leo Savio was not present, and the meeting was conducted by Len Stensland. Pending the resignation of Mr. Savio, Mr. Stensland will be appointed Chairman. Two of the guests present, Carl Hurty and T. Singh, joined the membership, and Gene Chitwood offered his help with the work.

Working Group on Transformers Connected to Generators

The Working Group met March 30 with 11 members and 8 guests present. In view of concerns raised about overexcitation capability of the GSU, Kelly Hale presented examples from the experience of Consumers Power showing the inability to fully utilize the transformer tap range to deliver leading vars with light system load. A proposal from John Woodall to use the transformer equivalent tee for determining unused core-excitation capability was discussed, as was an alternate proposal from Chairman Dean Yannucci. After discussion in which some objections were raised, the group agreed that since the guide will address the specifications for new equipment, it need not take up a matter related to an existing operating condition, but would alert the user to consider the need for higher-than-standard excitation.

Draft 2 of the guide (P785) with some revisions will be circulated for comments.

Working Group on Short-Circuit Duration

The Working Group met on March 30 with 10 members and 19 guests present. A ballot of the Transformers Committee of P784/D2 had been planned, but after experiencing difficulty with resolving negative ballots from the joint ballot of Working Group and Subcommittee, Chairman Bill Griffard elected not to conduct a ballot of the Committee. Instead a revised draft was developed from comments and balloted in the Working Group. The results of the P784/D3 ballot were

Affirmative	10 (4 with comments)
Negative	<u>4</u>
Total Returned	14 -- 67%
Not Returned	<u>7</u>
Total Issued	21

Discussion in the Working Group led to agreement on a new proposal to be balloted simultaneously in Working Group and Subcommittee. The new proposal distinguishes applications having frequent faults above 70% of maximum from those having infrequent faults. Voters will be permitted to suggest the threshold defining frequent faults so that the principle embodied in the proposal can be given a fair test.

Working Group on Loss Tolerance and Measurement

The Working Group met March 30 with 11 members and 9 guests attending. A ballot in the Subcommittee of P262E/D1 on instrument corrections for phase-angle error was conducted in January and February. Results were

Affirmative	32 (2 with comments)
Negative	<u>4</u>
Total Returned	36 -- 80%
Not Returned	<u>9</u>
Total Issued	45

Editorial changes worked out in the meeting resolved the two comments and two of the negative votes. If the other two negative ballots can be resolved, changes will be circulated to the Subcommittee, following which barring no objections, the Committee will be balloted.

Responses to a questionnaire of Subcommittee members on the correction of errors in no-load loss measurement from wave distortion show general agreement with techniques of the present standard, but with a belief that the standard should provide a better definition of allowable waveshape. Chairman Dave Takach will furnish summaries of the questionnaire response to Subcommittee members.

A ballot of the Working Group on changing default values for the proportions of hysteresis and eddy-current core losses will be conducted. The proposal is to specify 35% hysteresis, 65% eddy-current loss instead of 50-50%.

The Working Group postponed discussion of reference temperature for no-load loss until the next meeting because time allotted was insufficient to cover the agenda.

Working Group on Harmonic-Load-Current Heating

The Working Group met on March 30 with 8 members and 13 guests attending. Working Group status for the Ad Hoc Task Force formed at the last meeting of the Committee was granted yesterday by the Administrative Subcommittee. Formation of a Task Force on Rectifier Standards within the new Working Group was also authorized. E. F. Troy is Chairman of the Working Group, which has 13 members, and E. J. Cham is Chairman of the Task Force with 8 members.

The first order of business for both groups has been to develop scopes for the project authorization requests. The Working Group proposes to develop a recommended practice for determining the capability of transformers to supply non-sinusoidal load currents of known characteristics without sacrifice of transformer life expectancy. Ed Troy will draft a procedure based on certified test-report data. Don Kline will draft a procedure based on design data available only to the manufacturer and on the best analytical methods available in the industry.

The Task Force on Rectifier Standards met March 30 following the Working Group meeting and adopted as its scope the development of a standard for transformers serving semiconductor power rectifiers except for special applications such as welders, oscillators, radio receivers and other low-power devices, precipitators, and HVDC.

Project authorization requests conforming to these scopes will be prepared by the Subcommittee chairman and sent to the Committee vice-chairman.

Other Matters

A request from a TVA employee delivered to the chairman by Ray Smith asks for consideration of specifying excitation test data as peak current and average voltage so that the magnetization curve is more nearly approached. This method of test will yield data of more worth for modeling systems in transient studies. The request was confided to the Working Group on Loss Tolerance and Measurement for consideration and response.

Bill McNutt has pointed out a deficiency in the standard in that the requirement of capability for 105% secondary voltage at rated load and 80% or higher power factor is ambiguous for multi-winding transformers. This matter has been referred to John Dutton.

3.9 Recognition and Awards - J. Bonucchi

Mr. Bonucchi recognized 3 individuals for their significant contribution to the Power Engineering Society through their committee work. Certificates of Application were presented to Ed Uligh, former Chairman of Partial Discharge Working Group, Hal Margolis, former Chairman of the Working Group on Resonant Overvoltages, and Walter True, former Subcommittee Chairman of Audible Sound.

The IEEE Transformer Committee thanked these gentlemen for their outstanding contributions.

3.10 Transformer Standards - L. R. Smith

All Subcommittee Chairmen have again been cooperative and reported up-to-date status of their projects.

The following is a summary of the activities and status of the various subcommittee projects.

My records have the chairmen as listed below:

John Easley	Bushing
L. S. McCormick	Dielectric Tests
B. F. Allen	Dry Type Transformers
L. W. Long	Performance Characteristics
H. A. Pearce	Insulating Fluids
C. J. McMillen	Insulation Life
R. C. Thomas	Instrument Transformers
Roger G. Jacobsen	West Coast
L. R. Smith	Standards

Project Status

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

No change reported.

P21 - Revision of ANSI C76.1

In Bushing Subcommittee work still going on.

P24 - Revision of ANSI C76.2

Ballot closed. Seventy-five percent returns with one negative to be resolved.

- P65 - Thermal Evaluation of Ventilated Dry-Type Power and Distribution Transformers
Negative votes and comments on Draft 13 still being worked on.
- P-76 - IEEE Guide for Acceptance and Maintenance of Transformer Assemblies in Equipment
No change reported since March 1980.
- P-93 - Transformer Impulse Tests (C57.98)
No change reported.
- P238 - Revision of ANSI C57.21, Correction of Loss Measurements on Shunt Reactors
No change since March 1980.
- P252 - Short Circuit Test Guide
Printed as appendix to C57.12.90.
- P259 - Insulation Systems for Specialty Transformers
Standards board approved reaffirmation December 18, 1980.
- P262 - ANSI C57.12.90 Test Code for Liquid-Immersed Distribution, Power and Regulating Transformers
Printed along with Short Circuit Test Guide (P262D) as appendix.
- P262E - Revision of C57.12.90 Loss Tolerances
- First ballot in working group has no negatives. Will now ballot Performance Characteristics Subcommittee. No change reported.
- P283 - Oil-Immersed Transformers (10,000 kVA and Larger and 69 kV to 287 kV Voltage Rating)
Published November 7, 1980 as C57.12.11.
- P345 - Review of IEEE Std. 345-1972 Test Procedures for Thermal Evaluation of Oil-Immersed Distribution Transformers (C57.100-1974)
Ballot mailed to Insulation Life Subcommittee incorporating statements and updating of references.

- P462 - ANSI C57.12.00 General Requirements for Liquid-Immersed Distribution, Power and Regulating Transformers
Printed.
- P462C - Revision of C57.12.00 Loss Measurements
See 262E.
- P462D - Revision of Wording for Ratio Tolerance Section C57.12.00
Printed as appendix to C57.12.90.
- P507 - Revision of C57.92 The Power Transformer Loading Guide
In process of editing and typesetting at ANSI.
- P513 - Seismic Guide for Power Transformers and Reactors
Submitted to Transformer Committee. No negative ballots.
Now going to Standards' board.
- P514 - Guide for Installation of EHV Oil-Immersed Transformers 345 kV and Above
Published as C57.12.12-1980.
- P523 - Guide for the Control of Transformer Sound
No change reported.
- P545 - Recommended Practice for Partial Discharge (Corona) Tests for Transformers
No change reported.
- P546 - Revision of ANSI Requirements for Instrument Transformers C57.13-1978
Subcommittee met in Chattanooga on March 23 - 24, 1981 working on revision of C57.13-1978.
- P638 - Standard for Type Tests on Class IE Transformers for Nuclear Power Generating Stations
No change reported.
- P670 - Switchgear and Transformers Working Group on Instrument Transformers for High Voltage Circuit Breakers
No change reported.

- P673A - Shunt Reactor Audible Sound Test Code Addition to ANSI C57.21
No change reported.
- P673B - Shunt Reactor Vibration Test Code Addition to ANSI C57.21
No change reported.
- P731 - Revision of Guide for Loading Current Limiting Reactors,
ANSI C57.99
Jim Spencer of Trench Electric will be the new chairman.
- P732 - Revision of Current Limiting Reactor Standards, ANSI C57.16
No change reported.
- P733 - Revision of Shunt Reactor Standard, ANSI C57.21
In process of typesetting and editing at ANSI.
- P740 - Dielectric Test Requirements for Power Transformers for
Operating at System Voltage from 69 through 230 kV (C57.XX)
No change reported.
- P745 - Guide for Conducting a Transient Analysis for Dry-Test
Transformers (C57.XX)
No change reported.
- P756 - Guide for Loading Transformers Above 100 MVA
Will review new Loading Guide. To present Draft No. 3 at
Portland. Subgroup D presented paper at winter meeting in
Atlanta in February.
- P757 - IEEE Guide for Loading Power Apparatus Bushings
Ballot closed November 30, 1980. Seventy-five percent returned.
Reminder sent out. Zero negatives thus far.
- P784 - Coordination of Overcurrent Protective Devices With Power
Transformers
No change reported.
- P785 - Transformers Connected to Generators
Proposed Guide reviewed in October 1980 at Milwaukee.
Will hold two meetings in Portland.

- P786 - Transformer Failure Reporting and Reliability Analysis
No change reported.
- P787 - Transformer Loss Measurements and Tolerances
No change reported.
- P799 - Guide for Handling and Disposing of Askarels
Will work on this guide at Portland.
- P800 - Bushing Application Guide
Bushing Subcommittee working.
- P801 - Recommendations for Revisions to ANSI C57.15 Requirements, Terminology and Test Code for Step-Voltage and Induction-Voltage Regulators.
Draft No. 2 worked on in Portland.
- P832 - Detection and Measurement of Partial Discharge (Corona) in Instrument Transformers
Probably to be incorporated into C57.13.
- P838 - Guide for Performing Overload Heat Runs
Underway in preparation of Draft No. 4 of "Recommended Procedure of Overload Heat Runs for Oil-Immersed Power Transformers." Questionnaire to Insulation Life Subcommittee and Thermal Test Working Group for views on overload profile.
- P842 - Loss Evaluation Guide for Power Transformers and Reactors
No change reported.

Two requests for Project Authorization have been forwarded. These will be identified in the new manner; that is, no P number as we have known them will be assigned, but the project will be known by its ANSI number as follows:

1. PC57.95 - Revision of Guide for Loading Oil-Immersed Voltage Regulators. This work will be done by the Guides for Loading Working Group under the Insulation Life Subcommittee.
2. PC57.96 - Revision of Guide for Loading Dry-Type Distribution and Power Transformers under Dry-Type Loading Guide Working Group.

The following standards are now in print.

C57.12.00
C57.12.11
C57.12.12
C57.12.90 with the Short Circuit Test Guide as an addendum.

Bill Wrenn will chair the Task Force to revise the Step-Voltage Regulator Loading Guide replacing Harold Wills.

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.

3.11 West Coast Subcommittee - W. McNutt for R. J. Jackson

No report is available since no meetings have occurred since the last Transformer Committee Meeting. Two meetings will occur before the Fall 1981 Meeting.

4.0 Transformers Committee Liaison Reports

PES STANDARDS COORDINATING COMMITTEE (E. J. Savio)

The PES Standards Coordinating Committee met during the IEEE Winter Power Meeting. The following summarizes the item of interest to this committee:

* IEEE Standards operations are now about a \$1 million business and growing.

* The standards publication backlog has been substantially reduced; publication should be current by the end of the first quarter, 1981.

* The 1981 PES Representatives on the Standards Board are J. T. Boettger, E. F. Chelotti and L. M. Johnson.

* The 1981 NESCOM (NEw Standards COMmittee) has been expanded to include non-Standards Board Members. R. O. Duncan is the PES Representative on NESCOM.

* A new Committee REVCOM (REView COMmittee) has been established, at least temporarily, to conduct the detailed review of letter ballots. Changes in Standards Board procedures to provide for REVCOM are now being circulated for approval. E. F. Chelotti is the PES Representative on REVCOM.

- * The Chairman normally prepares, for convenience at NESCOM and REVCOM meetings, a summary of the Standards Project Authorization Requests (SPARS) and Standards for Letter Ballot. SCC Members indicated that they found these summaries to be of value. In the interest of coordination, copies will be sent to all SCC Members prior to and after each Standards Board meeting.
- * E. F. Chelotti reported that there has been an increase in international activity on definitions and terminology. He was able to attend a meeting of WG601 of IEC TC1. TC1 is concerned with the formulation of a dictionary of some 10,000 terms. WG601 is concerned with about 10% of these terms.
- * An article for the Standards Corner of the PES REVIEW has been submitted (from the SCC). Committee coordinators are reminded of the schedule sent to them in the memo (to SCC Members from L. M. Johnson) of 16 September 1980. Since there are several new SCC members, it was requested that the schedule be sent out again.
- * The appropriate time for responses on SPARs circulated for coordination was considered. It was decided to reaffirm the 30 day period. Anyone requiring a longer time should request an extension.
- * The ASME/IEEE agreement on the handling of quality assurance and qualification standards being developed is being reconsidered by the respective Staffs. NPEC, as the cognizant Technical Committee, has been asked to review the proposed change.
- * The Standards Board has appointed an Ad Hoc Committee to study and prepare recommendations on the numbering of IEEE Standards.
- * ASTM has recently emphasized a policy of not coordinating with other standards developing organizations. This has led to a conflict with ANST rules on accreditation.

ANSI C57 - TRANSFORMERS (J. C. Dutton)

STATUS OF IEEE AND ANSI C57 BALLOTS, AND PRINTING

ANSI C57 BALLOT NO.	IEEE PROJ. NO.	BRIEF DESCRIPTION	IEEE STDS BOARD SUBM.	ANSI C57 COMM. SUBM.	BSR SUBM.	EDIT, TYPESET	PRTD.
343		C57.12.50 (Dry-Type)	N/A	C	C		IP
344		C57.12.51 (Dry-Type)	N/A	C	C		IP
345		C57.12.52 (Dry-Type)	N/A	C	C		IP
346		C57.13.1 (Gd. Fld. Testing Rel. CT's)	C	C	C		IP
347		C57.12.20 (Dist. Trans. rev.)	C	C	C		IP
348		C57.21 (Shunt Reactors)	C**	C	C		IP
P733							
349		C57.94 (Dry-Type Rec. Pract.)	C	C	#		
P547							
350		C57.92 (Pow. Tr. Ldg. Gd.)	C	C	C		IP
P507							
351		C57.91 (Dist. Tr. Ldg. Gd.)	C	C	C		IP
P631							
352		C57.12.25 (Dist. Tr.)	N/A	C	C		
353		HVACC, C57.12.55, Dry Type	N/A	C	#		
354		HVACC, C57.12.27, Dist. Tr.	N/A	C	#		
355		HVACC, C57.12.13, Power Tr.	N/A	C	#		
356		HVACC, C57.13.2, Inst. Tr.	N/A	REBALLOT			
357		C57.97 Rescission	N/A	C	#		

** approved with conditions
expected to go to ANSI BSR shortly

Bltg. = balloting IP = in process C = complete N/A = not applicable

Since the last report ANSI/IEEE
C57.12.00, C57.12.90, C57.12.11,
and C57.12.12 have been printed.
(The Short-Circuit Test Guide is
also printed as an appendix with
C57.12.90.)

IEC ACTIVITIES (J. C. Dutton)

1. IEC Publication 76-3, 1980, "Power Transformers, Part 3: Insulation Levels and Dielectric Tests" has been issued and printed.
2. IEC Publication 76-5, "Power Transformers, Part 5: Ability to Withstand Short Circuit," has had Amendment No. 1 (Dec. 1979) issued.
3. Word has been received from the Secretariat of IEC TC 14 that voting on the Document 14 (Central Office) 46, the proposed "Specification for Dry-Type Transformers" has been completed. The US voted negative, but it appears that the proposal has passed.
4. There have been no meetings of IEC TC 14 or 14B since March 1980, and it is understood that the next meeting is scheduled in mid-1982.
5. IEC TC 14 has a new chairman, Mr. F. C. Pratt, of the United Kingdom. Mr. Pratt is associated with the Central Electricity Generating Board of England and Wales.
6. The following is listed for general information on the organization of IEC TC 14:

Subcommittees

- SC 14B : On-load tap-changers (US TA JC Dutton)
SC 14C : Reactors (US TA SL Foster)
SC 14D : Small special power transformers (US TA R. Village)

Working Groups of TC 14

- WG 9 : Preparation of a chapter of the IEC on transformer terminology
WG 14 : Insulation
WG 16 : Impulse testing guide
WG 17 : Dry-type power transformers
WG 18 : Revision of Publication 354 (loading guide, oil-immersed transfs.)
WG 19 : Amendments to Publication 76
WG 20 : Revision of Publication 551 (sound level measurement)

As US Technical Advisor, I can nominate appropriate individuals as members of the above Working Groups.

7. In my 1/23/81 letter to L. G. Easton, President-USNC/IEE, Mr. R. E. Liebich has been nominated as a "Member Working by Correspondence" of WG 20 (sound levels).
8. J. C. Dutton will be presenting a paper in late April at the American Power Conference entitled: "Change in International Trade and the Electrical Industry."

ANSI C57.12.1 - POWER TRANSFORMERS (J. C. Dutton)

1. A meeting of this Subcommittee was held in Philadelphia on 1/21/81 to consider any needed revision in ANSI C57.12.10-1977, which will need revision or reaffirmation in 1982.
2. A marked-up copy is being typed by NEMA and will be distributed to the ANSI C57.12.1 Subcommittee for comment and discussion of proposed changes.
3. Similar work is under way to prepare ANSI C57.12.30-1977 for revision.

ANSI C57.12.2 - TASK FORCE ON DISTRIBUTION TRANSFORMER PRESSURE RELIEF (J. R. Newton)

The last meeting of C57.12.2 was prior to our meeting in Milwaukee and the next one will be after our meeting in Portland.

Therefore, there will be no report for C57.12.2.

ANSI C57.12.5 - DRY TYPE TRANSFORMERS (J. C. Dutton)

1. ANSI Standards C57.12.50, .51, and .52 have been approved by ANSI and are being typeset.
2. Galley proofs of ANSI C57.12.50-1981 have been checked and returned for printing.
3. Similarly, ANSI C57.12.51 and .52-1981 are expected to be completed soon.

ANSI C57.13 - INSTRUMENT TRANSFORMERS (R. C. Thomas)

No Report

ANSI C57.15 - VOLTAGE REGULATORS (A. C. WURDACK)

The C57.15 subcommittee has not had a meeting since the last transformers meeting and one has not been scheduled.

ANSI C57.17 - ARC FURNACE TRANSFORMERS (R. D. Morris)

In as much as the ANSI C57.17 Subcommittee on Arc Furnace Transformers has been inactive, there have been no meetings held. As a result, there is nothing to report.

ANSI C57.21 - SHUNT REACTORS (S. L. Foster)

The only activity in C57.21 has been the request by the C57 Committee to re-evaluate the scope of this Committee. Our recommendation as Chairman of that Committee was abolishing of the Committee and making a Chairman of the Working Group on Shunt Reactor Standards of the Standard Subcommittee, IEEE Transformers Committee the Liaison Representative to ANSI Committee C57.

ANSI C62 - SURGE PROTECTIVE DEVICES (E. J. Adolphson)

No Report

ANSI C68 - TECHNIQUES FOR DIELECTRIC TESTS (L. S. McCormick)

No Report

ANSI C76 - BUSHINGS (N. J. Melton)

There is no activity to report in the ANSI C76 Committee

ANSI C84 - PREFERRED VOLTAGE RATINGS (J. C. Dutton)

1. An Ad Hoc Joint C84/C92 Working Group meeting was held in Philadelphia January 20, 1981, and attended by your liaison representative. Definitions and other matters of common interest to these two Committees were discussed.
2. In the proposed revisions of ANSI C57.12.10 and C57.12.30 now starting, the suggestions of the C57/C84 Ad Hoc Voltage Study Group will be proposed. (This was reported in the last liaison report.)

ANSI C89 - SPECIALTY TRANSFORMERS (S. J. Antalis)

1. No ANSI C89 meetings were held in 1980.
2. New officers for 1980-81 in the NEMA 8-ST Dry Type & Specialty Transformer Section (Secretariat for ANSI C89) are:
Chairman : Claus Ludeke
Vice-Chairman: P. J. Hopkinson
Secretary : Charles H. White
3. With the imminent publication of new ANSI Dry Type Standards C57.12.50 and C57.12.51, one of the tasks of the C89 Committee is to consider the duplication of dry type standards 601V through 15KV which will exist. ANSI C89.2 presently covers General Purpose transformers (600V & below), as well as High Voltage Dry Types 601V through 15KV.

ANSI C92 - INSULATION COORDINATION (J. C. Dutton)

1. Proposed revisions of Standards ANSI C92.1 and C92.2 have been approved.
2. The ANSI C92.1 Committee met in November 1980, but your liaison representative was unable to attend. Copies of the minutes of the meeting have been sent to the officers of the IEEE Transformers Committee.
3. An Ad Hoc Joint C84/C92 Working Group meeting was held in Philadelphia 1/20/81, and attended by your liaison representative. Definitions and other matters of common interest to these two committees were discussed.

ANSI C107 - DISPOSAL OF ASKAREL (H. A. Pearce)

This is to inform you that C107 is still inactive. We have had no recent meeting so I have nothing to report.

IEEE JOINT COMMITTEE ON NUCLEAR POWER STANDARDS (L. R. Stenslund)

No Report

CIGRE SC-12; TRANSFORMERS (W. J. McNutt)

There has been no SC-12 meeting since the last Transformer Committee meeting. Plans for the Transformer Colloquium are progressing well, with Transformers Committee involvement through:

L. W. Long - Discussion Director on "Overloading and Loading Limitations of Large Transformers"

4.3 HVACC Liaison Report - E. Huber

1. National Electrical Code - Article 450

Article 450 of the NEC, 1981 edition included new rules for "High Fire Paint Liquid - Insulated Transformers." Subsequently a Tentative Interim Amendment was issued that effectively reverted Section 450-23 back to the 1978 code. The TIA will be considered again at the next Code Making Panel meeting, scheduled for January of 1982.

If anyone wishes to submit proposals for consideration for inclusion in the 1984 NEC, these proposals must be received by the National Fire Protection Association by November 30, 1981. No new proposals will be accepted after that date.

2. Working Group IA - Chairman A. D. Kline (Southern Transformer Co.)

Document is "Proposed American National Standard Conformance Standard for Dry-Type Transformers Used in Unit Installations, Including Unit Substations." Balloted within HVACC Subcommittee I and submitted to C57 for comments which were provided by several members of C57. The comments which were provided by several members again balloted within HVACC Subcommittee I. It was approved (with comments which were resolved) and has been forwarded to C57 with recommendation for balloting for publication as Supplement C57.12.01(a)-198X, but it will be changed to C57.12.55-198X since comments indicated it should be issued as a separate document. Additional comments have been received and we are in the process of resolving these at this time.

3. Working Group 2 - Chairman H. W. Book (Westinghouse)

Document is "Proposed American National Standard Conformance Standard for Liquid-Filled Distribution Transformers Used in Pad-Mounted Installations Including Unit Substations." Balloted within HVACC Subcommittee I and submitted to C57 for comments which were provided by several members of C57. The comments were considered and resolved, and the document again balloted within HVACC Subcommittee I. It was approved but certain comments on the balloting for the dry-type transformer applied to this document also. These were resolved and this document has been forwarded to C57 with recommendation for balloting for publication as C57.12.27-198X. The ballot within C-57 resulted in some editorial comments which have been cleared and the document is now ready for submission to the ANSI Board of Review.

4. Working Group 2A - Chairman R. E. Uptegraff, Jr. (R. E. Uptegraff
Manufacturing Company)

Document is "Proposed American National Standard for Liquid-Filled Transformers, Excluding Pad-Mounted Compartmental-Type Transformers, Used in Unit Installations Including Unit Substations." Being balloted in HVACC Subcommittee I and has been sent to ANSI C57 for comments. Document is planned as C57.12.13-198X. The ballot within C-57 resulted in some editorial comments which have been cleared and the document is now ready for submittal to the ANSI Board of Review.

5. Working Group 11 - Chairman W. R. Goldbach

A HVACC document "Proposed Conformance Tests for Separable Insulated Connectors" was approved by HVACC Subcommittee I and forwarded early this year to ANSI C119 with a recommendation for balloting as publication ANSI C119.2(a) - 198X. It was also forwarded simultaneously to the IEEE Distribution Subcommittee for balloting. Since revisions of ANSI C119.2/IEEE-386 are currently being balloted, action on the proposed Conformance addendum within C119 is currently being withheld until completion of balloting on the parent document.

6. Working Group 14 - Chairman J. H. Keeler (General Electric)

Document is "Proposed Addendum to American National Standard for Instrument Transformers C57.13." Was balloted within HVACC Subcommittee I and was submitted to C57 for comments, which were obtained by th C57 Chairman from the IEEE Instrument Transformer Committee. The comments were considered and resolved, and the document again balloted within HVACC Subcommittee I. It was approved with comments which were resolved and has been forwarded to C57 and to IEEE with recommendation for balloting for publication as a supplement to C57.13. It was agreed that the designation of this document will be changed to ANSI/IEEE C57.13.2 for issuance as a separate document instead of as an addendum. Voting on this document in C57 is currently incomplete.

7. Working Group 16A - Chairman G. M. Bell (General Electric)

Document is "Proposed American National Standard Conformance Guide for Thermal Evaluation of Dry-Type Ventilated Transformer Insulation Systems." The document has been split into two sections, one covering conformance requirements and the other covering test procedures. The first section is being handled as an appendix to C57.12.55-198X which is covered by Item 1 above and has accompanied that document in its submittal to C57. The second section is being coordinated with IEEE-65 and will be issued by IEEE when complete; in the interim prior to IEEE issuance, the second section will be a second appendix to C57.12.55-198X.

8. Working Group 163 - Chairman R. D. Buckley (Westinghouse)

Document is "Proposed American National Standard Conformance Guide for Insulating Systems and Materials for Liquid-Filled Transformers." The document accompanied Item 2 above as an appendix when sent to HVACC Subcommittee I for balloting as well as when it was sent to ANSI C57 for comments. It is being handled as an appendix to the documents of both W.G.'s 2 and 2A on liquid-filled transformers.

5.0 Technical Papers for Future IEEE-PES Meetings

See Administrative Subcommittee, Section 3.0, for this report.

C. Honey made the point that 100 word summaries were required with the paper reviews.

6.0 No new business.

The meeting was adjourned at 11:20 p.m.

Respectfully submitted,

Dean A. Yannucci
Dean A. Yannucci
IEEE Transformers Committee