

IEEE TRANSFORMERS COMMITTEE
MINUTES OF MEETING
NOVEMBER 2, 1988
LONG BEACH, CALIFORNIA

IEEE TRANSFORMERS COMMITTEE
MEETING
NOVEMBER 2, 1988
LONG BEACH, CALIFORNIA

MEMBERS OR REPRESENTATIVES PRESENT (81)

- | | | | |
|-----|-------------------------------|-----|----------------------------------|
| 1. | B. F. Allen | 42. | R. E. Lee |
| 2. | R. Allustriarti | 43. | L. A. Lowdermilk |
| 3. | E. H. Arjeski | 44. | R. I. Lowe |
| 4. | J. C. Arnold | 45. | M. L. Manning |
| 5. | R. Bancroft | 46. | T. Massouda |
| 6. | D. A. Barnard | 47. | J. W. Matthews |
| 7. | L. Basel | 48. | S. P. Mehta |
| 8. | J. J. Bergeron | 49. | C. Millian |
| 9. | W. B. Binder | 50. | R. E. Minkewitz, Sr. |
| 10. | J. V. Bonucchi | 51. | M. I. Mitelman |
| 11. | J. D. Borst | 52. | H. R. Moore |
| 12. | C. V. Brown | 53. | R. J. Musil |
| 13. | O. R. Compton | 54. | W. H. Mutschler, Jr. |
| 14. | F. W. Cook, Sr. | 55. | J. W. McGill |
| 15. | J. Corkran | 56. | C. J. McMillen |
| 16. | D. W. Crofts | 57. | W. J. McNutt |
| 17. | J. N. Davis | 58. | E. T. Norton |
| 18. | D. H. Douglas | 59. | B. K. Patel |
| 19. | D. J. Fallon | 60. | W. Patterson |
| 20. | H. G. Fischer | 61. | J. M. Pollitt |
| 21. | M. Frydman | 62. | C. A. Robbins |
| 22. | D. W. Gerlach | 63. | L. J. Savio |
| 23. | D. A. Gillies | 64. | V. Shenoy |
| 24. | E. L. Grubb | 65. | W. V. Stein |
| 25. | F. J. Gryszkiewicz | 66. | L. R. Stensland |
| 26. | G. Hall (rep. by D. E. Oxten) | 67. | D. W. Sundin |
| 27. | J. H. Harlow | 68. | L. Swenson |
| 28. | F. W. Heinrichs | 69. | V. Thenappan |
| 29. | W. Henning | 70. | R. C. Thomas |
| 30. | K. R. Highton | 71. | T. P. Traub |
| 31. | P. J. Hoefler | 72. | D. E. Truax |
| 32. | R. H. Hollister | 73. | R. E. Uptegraff, Jr. |
| 33. | E. Howells | 74. | G. Vaillancourt |
| 34. | C. Hurty | 75. | R. A. Veitch |
| 35. | A. M. Iversen | 76. | L. B. Wagenaar |
| 36. | A. J. Jonnatti | 77. | R. J. Whearty |
| 37. | C. P. Kappeler | 78. | A. Wilks |
| 38. | J. J. Kelly | 79. | W. E. Wrenn |
| 39. | W. N. Kennedy | 80. | D. A. Yannucci |
| 40. | E. Koenig | 81. | E. J. Yasuda (rep. by F. Elliot) |
| 41. | J. G. Lackey | | |

IEEE TRANSFORMERS COMMITTEE
MEETING
NOVEMBER 2, 1988
LONG BEACH, CALIFORNIA

MEMBERS ABSENT (40)

- | | | | |
|-----|------------------|-----|-------------------|
| 1. | E. J. Adolphson | 21. | G. W. Iliff |
| 2. | L. C. Aicher | 22. | R. G. Jacobsen |
| 3. | D. J. Allan | 23. | D. C. Johnson |
| 4. | S. J. Antalis | 24. | E. J. Kelly |
| 5. | J. Aubin | 25. | A. D. Kline |
| 6. | P. L. Bellaschi | 26. | H. F. Light |
| 7. | S. Bennon | 27. | T. G. Lipscomb II |
| 8. | G. H. Bowers | 28. | L. W. Long |
| 9. | D. J. Cash | 29. | H. B. Margolis |
| 10. | J. C. Dutton | 30. | C. K. Miller |
| 11. | J. K. Easley | 31. | W. E. Morehart |
| 12. | J. A. Ebert | 32. | R. A. Olsson |
| 13. | C. G. Evans | 33. | H. A. Pearce |
| 14. | P. P. Falkowski | 34. | D. Perco |
| 15. | S. L. Foster | 35. | C. T. Raymond |
| 16. | H. E. Gabel, Jr. | 36. | W. E. Saxon |
| 17. | G. Gunnels, Jr. | 37. | E. G. Strangas |
| 18. | C. R. Hoesel | 38. | A. L. Tanton |
| 19. | C. C. Honey | 39. | J. A. Thompson |
| 20. | F. Huber, Jr. | 40. | A. C. Wurdack |

IEEE TRANSFORMERS COMMITTEE
MEETING
NOVEMBER 2, 1988
LONG BEACH, CALIFORNIA

GUESTS

- | | | | |
|-----|-------------------|-----|--------------------|
| 1. | J. L. Akers | 23. | R. Marek |
| 2. | M. S. Altman | 24. | D. Marlow |
| 3. | J. Antweiler | 25. | C. R. Murry |
| 4. | A. Bartek | 26. | L. Nicholas |
| 5. | V. Dahinden | 27. | S. K. Oklu |
| 6. | D. Dohnal | 28. | J. Patton |
| 7. | M. Franchek | 29. | P. A. Payne |
| 8. | R. H. Frazer | 30. | L. W. Pierce |
| 9. | R. Garcia | 31. | D. W. Platts |
| 10. | J. P. Gibeault | 32. | R. L. Provost |
| 11. | J. W. Grimes | 33. | G. J. Reitter |
| 12. | D. L. Hornak | 34. | J. Rossetti |
| 13. | E. W. Kalkstein | 35. | D. A. Roth |
| 14. | S. P. Kennedy | 36. | J. Schreiber |
| 15. | J. P. Kinney, Jr. | 37. | D. N. Sharma |
| 16. | G. A. Klein | 38. | R. W. Simpson, Jr. |
| 17. | G. Krause | 39. | D. Takach |
| 18. | P. Krause | 40. | J. A. Tingen |
| 19. | G. W. Lacasse | 41. | C. F. Todd |
| 20. | R. L. Lane | 42. | W. B. Uhl |
| 21. | F. A. Lewis | 43. | C. T. Walters |
| 22. | S. Lindgren | 44. | H. J. Windisch |

IEEE TRANSFORMERS COMMITTEE MEETING
MEETING MINUTES
NOVEMBER 2, 1988

Chairman Olin Compton opened the meeting at 8:01 a.m. by welcoming attendees to the session.

Chairman's Remarks and Announcements - Olin R. Compton

- a) Mr. Compton reported that the Technical Council is studying a "Corresponding Member" class. Such people would receive minutes of working groups and committees and would comment through correspondence. He feels this is an issue which we will become involved with in the future.
- b) A proposal is under discussion in the Technical Council wherein Technical Papers may, in the future, be able to be presented at Technical Meetings such as ours. Up to three papers could be presented. Agreement of both the author and committee would be required. These papers would then be published in the Transactions without presentation at the WPM or SPM.
- c) Future meetings of the Committee will be:
 - April 9-12, 1989; Chicago; Drake Hotel
 - October, 1989; Charlotte
 - March 25-28, 1990; Denver; Marriott Hotel
 - October 21-24, 1990; Montreal; Hotel Bonaventure
 - Spring, 1991; Phoenix
- d) Host Carl Hurty announced that 177 members and guests were registered with 47 spouses in attendance. Chairman Compton thanked Mr. Hurty, on behalf of the Committee, for the excellent arrangements and the great effort he expended in assuming the host's responsibilities on short notice.
- e) Chairman Compton submitted a written report to the Committee. (ATTACH. 11/88-A)

Minutes of Previous Meeting

The minutes of the May 13, 1987 meeting were approved as mailed.

Reports of Subcommittees:

Administrative Subcommittee - Olin Compton

Chairman Compton reported on efforts underway to improve the quality of Technical Paper presentations including: a) future consideration of the possibility of providing someone to present papers for non-English speaking authors; b) the possible review of all audio-visuals prior to presentation.

It was noted that there was a discussion at the ADCOM meeting relative to concerns regarding commercialism. It was reported that the following policy was adopted by ADCOM:

"Unsolicited Commercial Displays or Hospitality Rooms at Transformers Committee Meetings will not be sanctioned by the Committee."

We will cosponsor a session on D. C. High Voltage Power Measurements at the WPM with the Power Systems Instrumentation and Measurement Committee.

A discussion was held regarding emeritus members and voting on Transformers Committee Ballots. Since many emeritus members do not feel they have to return a ballot (and they do not have to) problems result with the 75% return requirement. Therefore, it is our policy that emeritus members will be sent ballots for informational purposes but they will not count in the required return/approval percentages. Their comments will, as always, be encouraged and welcomed.

Working Group and Subcommittee Chairmen were asked to send out ballots as soon as possible after meetings, thereby avoiding a crush of ballots immediately prior to the meetings. This will also improve return percentages. It was also noted that mailing labels from the Secretary are available for Main Committee Ballots.

The remainder of the Administrative Committee Report is contained in the attached report (ATTACH. 11/88-B and ADCOM-1-5).

Tribute to Olin Compton

Mr. Robert Veitch assumed the podium to express sincere appreciation, on behalf of the officers, subcommittee chairmen, and all members of the Committee, to Chairman Olin Compton for a job well done over his term as Chairman of the Transformers Committee. Mr. Veitch related that: "For the last two years, Olin has demonstrated the leadership required to muster all of our resources to achieve our goals. His fine sense of humor and easy going style has been instrumental in providing the friendly persuasion necessary to get us to go that extra mile. Let us all

show our appreciation to Olin for a job well done and we hope he will be with us for many years to come to continue to provide that leadership which he has so ably provided over the last two years". The Committee gave Mr. Compton an enthusiastic round of applause.

New Members of the Committee

The following individuals have been granted full membership on the Transformers Committee:

Westley Patterson; ASEA-Brown Boveri
Dana L. Basel; Westinghouse
Edgar Howells; McGraw Edison-Cooper Industries

West Coast Subcommittee - Dennis Gerlach

See Attached Report (ATTACH. 11/88-C)

Transformer Standards - James Harlow

Task Force and Working Group Chairmen were asked to review the Standards List to determine if a PAR is available. If one is not shown, Mr. Harlow does not have one. In this case, please send a copy to him or make application for one.

The 10 year rule as applied to C57.104 was discussed. This document shortly will be dropped by ANSI but it will continue as an IEEE document.

The remainder of Mr. Harlow's report is contained in the ADCOM minutes (ATTACH. B and it's Attachment ADCOM-1).

Recognition and Awards Subcommittee - Dean Yannucci

Certificates of Appreciation were awarded to the following past chairmen of the West Coast Subcommittee:

- 1) Tom Hawkins
- 2) Ron Little

Dennis Gerlach will handle the presentation of these awards to them at an appropriate gathering on the West Coast.

Our PES prize paper nomination was: "A Refined Mathematical Model for Prediction of Bubble Evolution in Transformers" by:

W. A. Fessler
T. O. Rouse
W. J. McNutt
O. R. Compton

The selection process for the Baker, Fink, and Thompson Awards will be reviewed prior to April 1, 1989.

Submissions for the Technical Committee Awards for Prize Paper, Distinguished Service, Technical Committee Working Group Recognition, and Certificates of Appreciation were selected and will be presented at the next meeting.

Performance Characteristics Subcommittee - John Borst

Mr. Borst reported that Mr. John W. Matthews of Baltimore Gas and Electric will succeed him as Chairman of the Subcommittee prior to the next meeting of the Committee.

See the attached report for the remainder of Mr. Borst's report (ATTACH. 11/88-D).

Insulation Life Subcommittee - Dave Douglas

Dave Douglas has assembled a table of Standard Symbols for Transformer Thermal Equations in accordance with the task given him. Copies of the list of symbols have been sent to Subcommittee Chairmen. They will be included in the Minutes as: ATTACH. 11/88-E. All members should familiarize themselves with these symbols and utilize them in the future.

The remainder of his report is attached (ATTACH. 11/88-F).

Insulating Fluids Subcommittee - Henry Pearce

Frank Heinrichs reported for Mr. Pearce. See Attached Report (ATTACH. 11/88-G).

Mr. Patel asked if C57.104 includes "Less Flammable Liquids"? The response was "no", and it was noted in discussion that there is a need for such a document pertaining to silicon fluids as well as other guide documents for this fluid. This item will be placed on the Subcommittee's agenda. Dean Yannucci asked "why is the C57.104 Guide limited to 10 MVA?" Bob Grubb felt that there are many smaller industrial transformers which could benefit from such a document. Olin Compton urged correspondence with the Chairman of the Insulating Fluids Subcommittee regarding this subject.

Instrument Transformers Subcommittee - John Davis

See Attached Report (ATTACH. 11/88-H).

Dry Type Transformer Subcommittee - Roy Uptegraff

See Attached Report (ATTACH. 11/88-I).

Note was made of a subcommittee action directing disapproval of UL1561 as an ANSI Standard as it is felt that it does not serve the consensus function normally attributed to the ANSI process.

Mr. Fryedman inquired as to the reasons why there was a lack of satisfaction with the partial discharge detection method. Mr. Uptegraff responded that the impedance in the voltage divider is too low to give an adequate sensitivity through the attenuation by unintended voids in a cast coil transformer and that there were more sensitive circuits available. Mr. Vaillancourt indicated that he has calculated sensitivity for various capacitance values and no where was the sensitivity below 3 pico coulombs. Thus, he feels there is no problem. Mr. Patterson proposed an LRC circuit, however, Mr. Vaillancourt felt the Q of the circuit could increase to the point of resonance which was unacceptable. Mr. Uptegraff requested correspondence with Mr. Don Kline.

Dielectric Tests Subcommittee - Robert Lee

See Attached Report (ATTACH. 11/88-J).

HVDC Converter Transformers and Reactors Subcommittee - W. N. Kennedy

It was noted that the Subcommittee was in need of Utility Members who write Specifications for DC products.

See Attached Report (ATTACH. 11/88-K).

Bushing Subcommittee - Loren Wagenaar

See Attached Report (ATTACH. 11/88-L).

Audible Sound and Vibration Subcommittee - A. Teplitzky

Len Swenson reported for Mr. Teplitzky.

See Attached Report (ATTACH. 11/88-M).

Reports of Liaison Representatives

EPRI

See Attached Report (ATTACH. 11/88-N).

Other Liaison Reports (ATTACH. 11/88-O)

SCC 4.0
SCC 4.1
SC - 12
ANSI C93
SPD

Technical Papers for Future IEEE/PES Meetings - Robert Veitch

See Attached Report (ATTACH. 11/88-P).

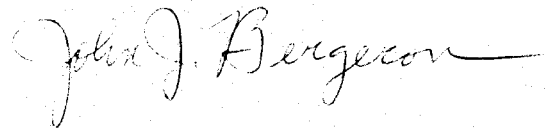
New Business

It was announced by Chairman Olin Compton that the following individuals would be the officers of the Transformers Committee for the 1989-1990 term:

Chairman - Robert A. Veitch
Vice-Chairman - John J. Bergeron
Secretary - John D. Borst

The meeting adjourned at 11:03 a.m.

Respectfully Submitted,



John J. Bergeron
Secretary

IEEE/PES TRANSFORMERS COMMITTEE

CHAIRMAN'S REPORT

1 November, 1988

This will be the last of my reports as Chairman, and frankly, I'm going to miss it.

I can proudly report that the Committee is in good shape and that it will be in good hands for the coming years. The officers for the 1989-90 term will be

Robert Veitch	NEI Ferranti Packard	Chairman
John Bergeron	Louisiana Power and Light	Vice Chairman
John Borst	Westinghouse Electric	Secretary

John Matthews, Baltimore Gas & Electric will replace Borst as Performance Characteristics SubCommittee Chairman.

Our Committee is fortunate to have such a wealth of talent available for leadership.

Another change of interest to the Committee is the almost complete shake-up of the IEEE Delegation to ANS C57, Transformers and Reactors. Joe Bonucchi is the only returning Transformers Committee member. Leo Savio will be the Delegation Head, with the following Delegation Members from the Committee:

John Bergeron	Joe Bonucchi	John Borst
John Davis	Robert Veitch	

James Harlow and Fred Huber will serve as alternates. In addition to the Transformers Committee representatives, there will be representatives from the Substations Committee and the Industry Applications Society.

One of the first duties of our new Committee Chairman will be the submittal of any desired revisions of the scopes of our subdivisions to the Technical Council. I urge the Chairman of every subdivision to once again review your scope and give Bob Veitch the changes.

I don't know when we have had so much trouble with our meeting schedules. The mix-up on hotel space schedule for this meeting was solved by Carl Hurty's willingness to volunteer to fill a void at a very late date and to his expertise. We certainly owe him a vote of special thanks for agreeing to be our host at the last minute following the retirement and resignations of the original Long Beach hosts.

The next meeting was also "rescued" from a schedule conflict with the T&D Conference through the extra,

expert effort of our Chicago host, Len Stensland. Our 1989 Spring Meeting will be at the Drake Hotel in Chicago, April 9-12, 1989. This is the week after the T&D Meeting in New Orleans.

The 1989 Fall Meeting will be at the Adamhost Hotel in Charlotte, NC, October 22-25, 1989.

The 1990 Spring Meeting will be at the Denver Marriott Hotel in Denver CO, March 25-28, 1990.

The 1990 Fall Meeting will be at Montreal, Quebec, Canada on October 21-24, 1990.

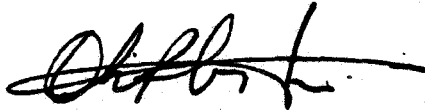
The 1991 Spring Meeting is now being planned for Phoenix, AZ with details later.

There was some discussion at the Washington meeting concerning a possible increase of our agenda to add one day to our present 2 1/2 day schedule. Based on the correspondence I've received, we will probably stay with the current Sunday through Wednesday noon schedule.

Finally, I want to express the sincere appreciation that Pat and I feel for all of the kindnesses we have received during the past two years. It is a real blessing to work and socialize with so many wonderful people.

I can't remember a single time that an officer or member of the Committee has not gone "the second mile" on any activity in which they were involved.

May God bless you all in all your future endeavors.



Olin R. Compton
11 1 88

IEEE TRANSFORMERS COMMITTEE
ADMINISTRATIVE SUBCOMMITTEE
OCTOBER 31, 1988
LONG BEACH, CALIFORNIA

Chairman Olin Compton opened the meeting at 7:30 p.m. with 12 members, 2 representatives of members, and 3 guests present.

Attendance:

Members:	John Bergeron	James Harlow
	John Borst	Robert Lee
	Olin Compton	Roy Uptegraff
	John Davis	Robert Veitch
	Dave Douglas	Loren Wagenaar
	Dennis Gerlach	Dean Yannucci
Representatives:	Frank Heinrichs	Lennart Swenson
Guests:	Carl Hurty	Len Stensland
	John Matthews	

The Minutes of the Washington, D. C meeting were approved as distributed.

The Agenda was accepted without modification.

Len Stensland discussed the arrangements for the upcoming Chicago meeting. The meeting will be at the Drake Hotel located at Michigan Avenue and Lakeshore Drive. It was agreed that the Tuesday luncheon could be eliminated in favor of a Tuesday evening dinner function. The room costs will be \$140.00 for either single or double accommodations.

Carl Hurty discussed the current Long Beach Meeting Results. There is a registration in excess of 170 attendees, plus 50 spouses. Approximately 160 sleeping rooms were used in the Convention Hotel. As a result of the proceeds from the Washington Meeting, it was decided to utilize some of the available funds for this meeting. This has been done. Of the 170 Registrants, 133 were Pre-registered.

Future Meetings of the Committee will be:

Chicago; Drake Hotel; April 9-12, 1989

Charlotte; ~~Adam Host Hotel; October 22-25, 1989~~

Denver; Marriott Hotel; March 25-28, 1990

Montreal; --- October 21-24, 1990

Phoenix; --- Spring, 1991

Baltimore; Fall, 1991

A location for Fall, 1991, hopefully in the Mid-America to South Eastern area will be solicited.

Olin Compton reported for Leo Savio concerning the Committee Manual Update. Presently we are being held up by the PES Technical Council's Manual which is under development and which will become a core document to all of the Standard Committees manuals.

Standards Coordinating Committee - Jim Harlow:

Jim Harlow presented a written status report on Transformer Standards, a copy of which is attached (Attach. ADCOM-1). It was noted that those standards listed under Item 5 as being withdrawn by ANSI on December 31, 1988, due to the ten-year rule, will not necessarily be withdrawn also by IEEE, but rather may remain as an IEEE Standard. Each Subcommittee Chairman was asked to review the list of Standards requiring re-affirmation per the 5-year rule and provide Jim Harlow with a realistic date for revision.

The PES Standards Committee Chairman requested review of the representation to C57. The delegation was reorganized per Item 7 in the attachment. It is expected to be effective January 1, 1989.

UL has asked ANSI-C57 for approval of their 1561 document. Roy Uptegraff will provide this review and advise the C57 delegation Chairman of his results.

A letter was received from the Dielectrics and Electrical Insulation Society regarding their need to obtain definition of major, realistic fire-fault scenarios to which transformers may be subjected. Roy Uptegraff will correspond with Tor Orbeck to obtain better definition of their needs and will report back to the Subcommittee at the next meeting.

It was reported that IEEE Standard 4, Standard Techniques for High Voltage Testing is up for revision and liaison has been requested. Bob Lee will obtain a representative for a November 15-16, 1988 meeting. Loren Wagenaar will also consult with Mr. Lee on this matter.

Review of Technical Council Activities - Olin Compton:

Olin Compton noted that it was now possible to have technical papers (up to 3 per year) presented at Standards Committees meetings and then printed in the Transactions. This will be on an experimental basis. The author would have the right to say where he wishes to have it presented. It was decided that we will wait until the rules are prepared before implementation by the Transformer Committee.

Future T&D Conferences will have both Transactions papers presented as well as Conference grade papers. There probably will be a conference record for the 1991 conference.

There is a proposal to set up a corresponding member provision for standards committees to promote involvement of foreign nationals in Committee activities.

Subcommittee Reports

Dry Type Transformers - Roy Uptegraff:

The new thermal equations symbols list which was prepared by Dave Douglas was discussed. It was decided to archive this document by addition to the Committee Operating Manual and attachment to the Minutes of this meeting.

Insulation Life - Dave Douglas:

A question arose in the Subcommittee regarding Transformer Thermal Equivalents. It was questioned where this subject should be handled, and it was decided that this subject belonged in Bob Grubb's Thermal Test Working Group.

The definition of average winding temperature rise was discussed relative to delta windings and/or series-parallel windings, and it was determined that the present definitions were adequate.

Insulating Fluids - Frank Heinrichs reported for Henry Pearce:

The recent ballot of the Gas Guide was discussed. The negative ballots resolutions were proceeding.

The C57.106 document was reported to be on schedule.

It was pointed out that the ASTM Test Methods were producing such poor repeatability for Chromgraphic Gas Analysis that the limits in C57.104 are, for practical purposes, fictitious as they cannot be practiced between labs. Their repeatability is near 50% for a test which requires 1-2% accuracy. The Subcommittee may have to become involved in improving the analyzation process through input to ASTM. It was decided that the Subcommittee must go to ASTM and ask them to take action after forwarding appropriate documentation of the inadequacies of the present methods.

Commercialism

After a discussion on the impact of commercialism on the Transformer Committee Meetings, it was decided that such had absolutely no place at our meetings and on a motion by John Borst, which was seconded by Robert Veitch, the Administrative Subcommittee unanimously adopted the following Policy:

"Unsolicited Commercial Displays or Hospitality Rooms at Transformers Committee Meetings will not be sanctioned by the Committee." This will be included in the Operating Manual.

Audible Sound and Vibration Len Swenson reported for Allan Teplitzky:

The document regarding Transformer Sound Power Measurement is proceeding with negative ballots being resolved. A Main Committee Ballot is anticipated by the next meeting. The Guide for Control of Transformer Sound will be under development shortly.

H.V.D.C. - William Kennedy:

They have received a PAR for their main standard and have several requests for liaison. At the meeting today, the outline for the test standard was accepted.

Mr. Kennedy reported that Terry McComb of the Instrumentation Committee had written a letter asking the Transformers Committee to jointly sponsor a panel session at the Winter Power Meeting on DC High Voltage Power Measurements. It was decided to accept the offer to co-sponsor this panel session.

Performance Characteristics - John Borst:

It was reported that the Load Tap Changer Group met with 20+ people present. It was decided to allow them to proceed with a PAR and will plan to elevate them to a Working Group Status in the future.

Dielectric Tests - Bob Lee:

See Attached Report (ATTACH. ADCOM-2)

Instrument Transformers - John Davis:

It was reported that C57.13 was reaffirmed. There were some negative ballots, but resolution of these was expected shortly. The method of preparation of standards on word processor was discussed; however, it was decided to stay with the current ASKI format files as there was concern over problems with many people having to learn and accurately use the newly available Microsoft IV software.

Bushings - Loren Wagenaar:

The Working Group on D.C. Bushings had their first meeting today. The question if wall penetration type DC condenser bushings were included in the scope was discussed. Guidance from the Administrative Subcommittee was requested. It was decided to contact the C29 Chairman and inquire if we can pick up this area as the Working Group would prefer to do so. It was recognized that this is not a part of the transformer, but no one was probably taking responsibility for this type of bushing.

West Coast - Dennis Gerlach:

The Seismic Guide is being balloted. As of this evening, required returns are slightly short of the 75% requirement. A few negatives were being reconciled.

Voting Discussion

The subject of ballots sent to Emeritus members of the Transformers Committee was discussed. It has become unclear to some people as to what responsibility they had regarding Main Transformer Committee Ballots sent to Emeritus members. After considerable discussion, the following Policy was adopted and will be included in the Operations Manual: "Emeritus Members of the Transformers Committee will be sent ballots of the Main Committee for informational purposes. Their comments and guidance will thereby be encouraged and solicited. However, their ballots will not count as part of the number of mailed ballots, nor as part of the number of returned ballots, nor as a part of the number of negative ballots."

Papers for Future Meetings - Robert Veitch:

Mr. Veitch submitted a written report, see Attachment (ATTACH - ADCOM-3). During discussion of this report, and specifically Item 4 of the Technical

Council Publications Committee discussion, a Motion was made by Dean Yannucci which was seconded by Robert Lee to oppose the draft PUB policy which would require sponsoring committees to ensure alternate paper presentation methods for authors who cannot attend the conference to present his paper. The motion carried unanimously.

Awards - Dean Yannucci:

See attached report (ATTACH - ADCOM-4).

Membership Review - John Bergeron:

A discussion was held of the criteria for continuing membership on the Main Committee as well as of the need to review the status of several individuals. Mr. Bergeron will circulate names of members apparently not meeting attendance requirements to Subcommittee Chairmen for comment.

Longer Meeting Schedule - Olin Compton:

The consensus after the last ADCOM discussion and review correspondence received on this subject strongly indicated that people did not want longer meetings. Task Forces will be encouraged to use Sunday afternoons if meeting times are a problem.

New Members of Main Committee - Olin Compton:

The following new members were approved by ADCOM upon recommendation by their sponsoring Subcommittee Chairmen:

Westley Patterson
Dana L. Basel
Edgar Howells

Asea-Brown Boveri
Westinghouse
McGraw Edison-Cooper Industries

New Business

Mention was made of the very heavy load of ballots which have recently been received by members of the committee. It was decided that Subcommittee Chairmen should encourage working groups to give proper time for ballots.

It was agreed to have new stationery printed; however, the names will not be included.

Note was made of the need for those who are balloting the Main Committee to obtain an accurate, up-to-date set of mailing labels for the Main Committee Members from the Secretary. This will ensure an accurate ballot and eliminate problems wherein returns from those who are no longer members were being solicited.

Chairman Olin Compton thanked ADCOM for their assistance during his tenure.


New Officers of the Committee

Chairman Compton announced that the following officers would begin service of two-year terms on January 1, 1989: Robert Veitch, Chairman; John Bergeron, Vice Chairman; John Borst, Secretary.

Closing

The last order of business was a sincere expression of thanks and appreciation which was extended to Chairman Olin Compton by all of the members of the Administrative Subcommittee for a job well done over his term of office.

The meeting adjourned at 10:50 p.m.


John J. Bergeron
Secretary

ATTACH
ADCOM - 1
10/31/88
P1

TO: Members of IEEE Transformers Committee
Administrative Subcommittee
October 31, 1988

SUBJECT: Status Report - Transformer Standards

Following are topics of interest for period April 11, 1988 to October 31, 1988:

1. Active Transformers Committee Projects. A listing of project activity, by subcommittee, is included as attachment.
2. The PES Standards Coordinating Committee meets only at the Winter Power Meeting. There is no liason report for the period of this report.
3. Liason with other PES Technical Committees established in period.

<u>TC</u>	<u>PROJECT</u>	<u>LIASON REPRESENTATIVE</u>
PSR	IEEE Guide for the Application Current Transformers Used for Protective Relaying Purposes	J. N. Davis

4. ANSI "Standards Action" reports the following newly published non TC standards which may be of interest to Transformers Committee personnel (March 25, 1988 - Sept. 23, 1988).
 - * ANSI C57.12.28-1988, Switchgear and Transformers - Padmounted Equipment - Enclosure Integrity
 - * IEC 289-1988, Reactors
 - * IEC 404-10-1988, Magnetic Materials - Part 10 - Methods of Measurement of Magnetic Properties of Magnetic Sheet Steel and Strip at Medium Frequencies.
5. The following Standards in C57 were approved ten or more years ago and will be withdrawn by ANSI on December 31, 1988 unless reaffirmed or revised before that date:
 - * ANSI C57.17-1965 (R1978). Status: Unknown
 - * ANSI/IEEE C57.12.01-1979 - General Requirements for Dry Type Distribution and Power Transformers. Status: Revision sent to RevCom October 1988.
 - * ANSI/IEEE C57.12.91-1979 Status: Unknown
 - * ANSI/IEEE C57.104-1978 - Guide for the Detection and Determination of Generated Gases in Oil Immersed Transformers and Their Relation to the Serviceability of the Equipment Status: Being revised in Insulating Fluids Subcommittee

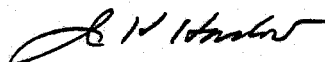
* ANSI/IEEE C57.105-1978 - Guide for Application of Transformer Connections in Three-Phase Distribution Systems. Status: Apparently an error on the part of IEEE or ANSI. Guide was reaffirmed by IEEE Standards Board June 11, 1987.

6. The following standards in C57 are beyond the 5 year rule. A formal request is required of ANSI to extend beyond December 31, 1988. The request is to include a realistic estimate of time required if extensions are requested. I seek the advice of the appropriate subcommittee chairman in order to compose a response.

C57.12.13-1982	IEEE C57.12.11-1980
C57.12.21-1980	IEEE C57.12.12-1980
C57.12.22-1980	IEEE C57.21-1981
C57.12.25-1981	IEEE C57.91-1981
C57.12.27-1982	IEEE C57.92-1981
C57.12.40-1982	IEEE C57.94-1982
C57.12.50-1981	IEEE 24-1984
C57.12.51-1981	IEEE 757-1983
C57.12.52-1981	

7. The following Transformers Committee members have been designated as PES Representatives to ANSI C57:

L. J. Savio	Head
J. J. Bergeron	Representative
J. V. Bonucchi	Representative
J. D. Borst	Representative
J. N. Davis	Representative
R. A. Veitch	Representative
J. H. Harlow	Alternate (also Accredited Standards Representative Coordinator)
F. Huber	Alternate



J. H. Harlow, Chairman
Standards Subcommittee

Subcommittee: Audible Sound and Vibration
Subcommittee Chairman: Allan M. Teplitsky (212/460-4859)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS. COMM.</u>	<u>AS OF/STATUS</u>	<u>PES COORD.</u>
P523	PC57.112	A. Teplitsky	Guide for the Control of Transformer Sound	Yes (8/73)	4/11/88 - No Report	
	PC57.12.90b	A. Teplitsky	Transformer Sound Power Measurement	Yes (3/86)	4/11/88 - Resolution of ballots RM	

Subcommittee: Bushing
Subcommittee Chairman: Loren B. Wagenaar (614/223-2259)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS. COMM.</u>	<u>AS OF/STATUS</u>	<u>PES COORD.</u>
P21	PC57.19.00	L. B. Wagenaar	General Requirements and Test Procedures for Outdoor Apparatus Bushings (Rev. of ANSI C76.1)	Yes (4/79)	10/12/88 - D/8 being balloted by subcommittee.	SWGR T&D PSR IC
P757	PC57.19.101	F. E. Elliott	Guide for Loading Apparatus Bushings	Yes (5/78)	8/29/88 - Reaffirmation request submitted to RevCom	PSR SWGR SUB
P800	PC57.19.100	F. E. Elliott	Bushing Application Guide	Yes (4/79)	10/29/88 - D/2 Ballotted by WG	SWGR SUB PSR
			WG Bushings for HVDC Applications	None Required	4/11/88 - No report	
		L. D. Miller	TF Bushings for Distribution Transformers	None Required	4/11/88 - No Report	

Subcommittee: West Coast
Subcommittee Chairman: Dennis Gerlach (Telephone 602/236-5483)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS. COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
P513	PC57.114	S. Oklu	Seismic Guide for Power Transformers and Reactors	Yes (7/73)	8/18/88 - D/17 to full committee for ballot.	NPE Sub
P842	PC57.120	R. Jacobsen	Loss Evaluation Guide for Power Transformers and Reactors	Yes (5/80)	2/18/88 - One negatived ballot returned to date.	Sub RM PG
	PC57.93	D. Johnson J. Gillies, VC	Guide for Installation of Liquid Immersed Power Transformers (Including C57.12.11 and C57.12.12 Consolidation)	Yes (6/82)	2/18/88 - Work restarted	None
	PC57.128	H. Johnson	Fire Protection of Outdoor Liquid Immersed Power Transformers	No	6/14/88 - PAR withheld pending specific questions.	NPE Sub PSR

ADCOM-1
P4

Subcommittee: Dielectric Tests
Subcommittee Chairman: Robert E. Lee (215/398-5150)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
		H. R. Moore	WG on Revision of Dielectric Tests			
	PCS7.21a	W. M. Kennedy	TF on Revision of Dielectric Tests of Shunt Reactors	Yes (2/86)	4/11/88 - Discussion on D/6 re dielectric tests	None
	PCS7.12.00j	R. A. Veitch	TF on External Phase to Phase Clearances for Power Transformers	Yes (2/86)	4/11/88 - Reviewing ballot on D/7	None
PCS7.98		R. E. Minkwitz	TF Revision for Guide for Transformer Impulse Tests	Yes (2/86)	4/11/88 - Review of scope of TF	None
		C. V. Brown	WG for Revision of Dielectric Testing of Distribution Transformers			
PC 57.12.90c		W. R. Henning	TF on Routine Impulse Test for Distribution Transformers	Yes (9/87)	4/11/88 - D/5 Ballot prepared for Subcommittee and WG.	RM PSC
		R. E. Lee	TF on Low Side Surge Requirements for Distribution Transformers	None	4/11/88 - Organizational meeting. Will consider grounding and testing.	
		G. H. Vaillancourt	WG on Partial Discharge Tests for Transformers			
		W. J. Carter	TF for Measurement of Apparent Charge	None	4/11/88 - Discussion re data collection format	
PCS7.127		E. Howells	TF on Guide for the Detection of Acoustic Emissions From Partial Discharges in Oil-Immersed Power Transformers	Yes (3/88)	4/11/88 - D/10 to be balloted Subcommittee and WG	T&D PG

Subcommittee: Instrument Transformers
Subcommittee Chairman: John M. Davis (404/447-7386)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
P546	PCS7.13		Standard Requirement for Instrument Transformers	Yes (5/80)	4/11/88 - D/6 to be submitted to subcommittee for ballot	PSIM PSR SPD
P670	C37.077	J.G. Reckleff (Joint w/Swgr)	Requirement for Current Transformers for use with AC-High-Voltage Circuit Breakers	No	4/11/88 - Procedure to be submitted to subcommittee for ballot.	?
P832	PCS7.13.4	A. J. Jonnatti	Detection of Partial Discharge and Measurement of Apparent Charge Within Instrument Transformers	Yes (10/79)	4/11/88 - Draft to be ready at next meeting.	T&D

Subcommittee: Dry Type Transformers
Subcommittee Chairman: Roy E. Uptegraff, Jr. (412/887-7700)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
	CS7.21 (contribution)	R. Dudley	Loading Dry Type Reactors	None Required	4/11/88 - Preparing revisions for Tables 2 & 3	None
P259	None	A.M. Iverson	Standard Test Procedure for Evaluation of Systems of Insulation for Specialty Transformers	No	4/11/88 -D/3 discussion	?
	PCS7.12.01	E. Koenig	General Requirements for Dry Type Distribution and Power Transformers	Yes (7/82)	4/11/88 - Resolution of negative ballots of D/5. 9/22/88 - Submission ready for StB	None
	PCS7.96	W.H. Mutschler	Guide for Loading Dry Type Distribution and Power Transformers	Yes (2/81)	6/15/88 - Submission approved pending condition.	PSR PSIM
	PCS7.124	A.D. Kline	Recommended Practice for Measuring Partial Discharge and Measurement of Apparent Charge in Dry-Type Transformers	Yes (1/86)	4/11/88 - D/5 to be balloted in WG.	None
	PCS7.12.60	G.L. Bowers	Standard Test Procedure for Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers	Yes (11/85)	4/11/88 - Discussion re ballot of draft.	Unclear
P1052	PCS7.12.59	R. E. Uptegraff	Dry-Type Transformer Through Fault Current Duration Guide	Yes (84)	4/11/88 - Has been approved by StB. Held pending PCS7.96 revision	PSR SWGR
		G.L. Bowers	Task Force on Flammability and Toxicity	No	4/11/88 - Will gather info on flammability criteria.	
	PCS7.12.58	A. D. Kline	Guide for Conducting Transient Voltage Analysis of a Dry-Type Transformer Coil	No	4/11/88 - Returned by StB for endorsement by IAS and IEC	

Subcommittee: HVDC Converter Transformers and Smoothing Reactors
Subcommittee Chairman: William N. Kennedy (413/494-2322)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
	PCS7.129	W. Kennedy	Dielectric Tests for HVDC Transformers and Reactors	No	4/11/88 - Discussion regarding dielectric testing and harmonic losses. 10/10/88 - PAR request sent to NesCom	RM T&D

Subcommittee: Insulating Fluids
Subcommittee Chairman: Henry A. Pearce (412/983-4335)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS. COMM.</u>	<u>AS OF / STATUS</u>	<u>PES COORD.</u>
	PC57.106	F. W. Heinrichs	Guides for Acceptance and Maintenance of Insulating Oil in Equipment	Yes (4/86)	4/11/88 - D/1 being prepared	None
	PC57.104	H.A. Pearce	Guide for the Detection and Determination of Generated Gases in Oil-Immersed Transformers and Their Relation to the Serviceability of the Equipment	Yes (12/81)	4/11/88 - D/5 Under review Draft to be balloted by subcommittee before next meeting	PSR T&D
P954	PC57.121	H.A. Pearce	Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluid in Transformers	Yes (12/81)	2/22/88 - Submission approved by RevCom.	T&D PSR
	PC57.111	H.A. Pearce	Guide for Acceptance and Maintenance of Silicone Fluid in Transformers	Yes (12/87)	3/21/87 - New PAR approved by NesCom.	T&D PG

Subcommittee: Insulation Life
Subcommittee Chairman: David H. Douglas (216/447-3370)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS. COMM.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
	PC57.91	W.E. Wrenn	Guide for Loading Mineral Oil-Immersed Transformers	Yes (3/85)	4/11/88 - Inputs of 4 TF being reviewed.	Sub T&D PSE
	PC57.100	A.C. Wurdack	Standard Test Procedure for Thermal Evaluation of Oil-Immersed Distribution and Power Transformers	No (Pending)	4/11/88 - Various inputs being assembled.	NPE RM T&D SPD
P838	PC57.119	R.L. Grubb	Recommended Procedures for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Rating	Yes	4/11/88 - D/10 and tutorial appendix discussed.	SNGR SUB PSR

Subcommittee: Performance Characteristics
Subcommittee Chairman: John D. Borst (314/634-2111)

IEEE NO.	ANSI NO.	WG/TF CHAIRMAN	IDENTIFICATION	PAR ON FILE TRANS COMM.	AS OF/STATUS	COORD.
P638	None	L.R. Stensland	Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Yes	4/8/88 - D/16 submitted to ballot of main committee	NPE SUB
	PCS7.18.10	C.G. Pounds	Practices and Requirements for Semiconductor Power Rectifier Transformers	Yes (6/81)	4/11/88 - D/6 discussion by working group	None
	PCS7.21	J.W. McGill	Requirements, Terminology, and Test Code for Shunt Reactors over 500 KVA	Yes (6/88)	6/9/88 PAR Approved 4/11/88 - D/7 being prepared	RM T&D PSR
P785	PCS7.116	B.K. Patel	Guide for Transformers Directly Connected to Generators	Yes (2/79)	5/25/88 - Document submitted to IEEE Std. Board	PG PSR RM NPE
P262 E3	PCS7.12.90 e3	W.R. Henning	CS7.12.90e3 - Revision of CS7.12.90 Section 8 - "No Load Losses and Exciting Current"	No	4/11/88 - Complete - Awaiting Section 9 rework.	?
P262 E2	PCS7.12.90 e2	W.R. Henning	Revision of CS7.12.90 Section 8.3.3	No	4/11/88 - D/8 approved by TC 1985. Text held pending CS7.12.90e3 project.	?
P262 E1	PCS7.12.90 e1	W.R. Henning	Addition to CS7.12.90 Section 8	No	4/11/88 - D/4 text being held pending CS7.12.90e3 project.	?
P262 E	PCS7.12.90e	W.R. Henning	Revision of CS7.12.90 Section 9 - Load Loss and Impedance Tests	No	4/11/88 - Draft discussed by WG.	?
P1098	PCS7.123	W.R. Henning	Guide for Transformer Loss Measurement	Yes (3/85)	4/11/88 - Work awaiting conclusion of CS7.12.90e	PSIM
P462C	PCS7.12.00	W.R. Henning	Supplement for Allowable Loss Tolerances and Methods of Loss Measurements	No	11/3/87 - Proposal pending round-robin test.	?
	PCS7.125	D.J. Cash	Guide for Failure Investigation, Documentation and Analysis for Power Transformers and Shunt Reactors	Yes (2/87)	4/11/88 - Seeking resolution of negative ballots on D/5	T&D PGS PSE SWGR
		R. H. Frazer	TF - LTC Position Indication	No	4/11/88 - Summary report issued	
	PCS7.12.00i	J. W. Matthews	TF-Nameplate Information "Directed Flow"	Yes (12/86)	4/11/88 - Awaiting input from Loading Guide WG.	
		C. J. McMillen	TF-Routine Resistance Test CS7.12.00k, Table 14	No	4/11/88 - To be considered by Herring WG.	
		T. P. Traub	TF-LTC Performance Reports	No	4/11/88 - Newly formed TF	

ATTACH.
ADCOM-2
10/31/88

DIELECTRIC TESTS SUBCOMMITTEE
ACTIVITIES
ADMINISTRATIVE SUBCOMMITTEE - 10/31/88

1. Membership - 52

Olin's letter indicates that John Dutton, Charley Honey, George Iliff and Harold Light are off and Dave Douglas' letter indicates that Al Wurdak has resigned. I have Bill Carter, Ramon Garcia, Richard Lowe and Greydon Woolerton as members. Also, W. E. Boettger and Jim Douglass are not members. I have correspondence that Jean Pierre Gibeault will replace Greydon Woolerton. Therefore, my final tally is 52.

2. Propose Ed Howells for membership in the Transformers Committee. Ed has been chairing the Task Force for Acoustic Detection of Partial Discharge.

3. Standards Activities

- a. Bill Kennedy - PC57.21/D7 - Requirements, Terminology and Test Code for Shunt Reactors over 500 kVA.

Balloted at the Dielectric Tests and Performance Characteristics Subcommittees.

- b. Bob Veitch - PC57.12.00j - External Phase-to-Phase Clearances for Power Transformers. Bob reports successful Committee balloting with 82% acceptance and 1 negative ballot resolved. The Task Force has completed its work and will be disbanded.

- c. Bill Henning - PC57.12.90c - Routine Impulse Test for Distribution Transformers. Discussion of ballot of Draft 6 is scheduled for Long Beach.

- d. Ed Howells - PC57.127 - Trial Use Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers. PC57.127/D1 was balloted at the Dielectric Tests Subcommittee level.

Robert E. Lee

Robert E. Lee
October 28, 1988

IEEE/PES TRANSFORMERS COMMITTEE
REPORT ON TECHNICAL PAPER ACTIVITIES

(a) 1988 PES Summer Power Meeting (SPM)

The SPM was held in Portland, OR from July 24-29. There were two Transformer Sessions, one on July 26, where four papers were presented and the second on July 27 where three papers were presented. I chaired the Transformers I session and Jim Gillies chaired the Transformers II session.

There was also a very well attended panel session sponsored by the T & D Committee titled, "Amorphous Transformers - Where are we?" Two of our Transformers Committee members were on the panel, our Chairman Olin Compton, presenting his thoughts from the user viewpoint and Larry Loudermilk with the manufacturers viewpoint.

(b) 1989 PES Winter Power Meeting.

Ten papers were submitted for the 1989 WPM. Five have been accepted for presentation, four were rejected and one was withdrawn. Again, I would like to thank all those members who were able to review the papers and return their reviews and comments in a timely manner. As a result of having only five papers accepted, there will be only one Transformers Session at the WPM in New York.

(c) 1989 T & D Conference

The 1989 T & D Conference will be held in New Orleans April 2-7. At this time, I have received 21 Declarations of Intent, thus if all declarations of intent result in a paper, we will have 21 papers to review for this conference. The deadline for receipt of manuscripts in New York was Oct. 7. At this time I have only received eight papers and they have been sent to various members for review. For the papers sent out for review at this time, I have asked that the "yellow" RF-2 form and accompanying comments be returned to me by Nov. 14. This is not much time, however, it has been dictated by PES headquarters asking for my "Green" RF-3 forms by Nov. 14 in New York. I have talked to Nancy Heitman, Manager of Society Special Services about this date but she was not able to change it as it was set by the Technical Paper Co-ordinator of the conference. I told her we would do the best we could but it appears obvious to me that the Nov. 14 date to have all reviews into headquarters is unrealistic.

Technical Council Publications Committee

This committee met at the SPM in Portland on July 25, 1988. The following items from this meeting should be noted:

1. The Publication Guide for Mandatory Review of Visuals and Use of Overhead Transparencies is being revised and new guidelines will be presented. As you know, overhead transparencies have not been permitted at recent meetings but this policy is now being reviewed. In the future, all visuals will have to be approved by the Technical Program Co-ordinator before they can be shown at a technical session.
2. The subject of Conference Record Status Papers was discussed. It was agreed that all papers to be presented at the 1989 T & D Conference will be published as Transactions papers. The "Conference Paper" classification will not be introduced until the 1991 T & D Conference.
3. A training session was held for new Technical Paper Co-ordinators. Each new Vice-Chairman is automatically the Technical Paper Co-ordinator and is very quickly thrust into the job of sending out papers for review, checking the reviews, deciding which papers will be published and which will not and finally setting the program for the Summer and Winter Power Meetings. These training sessions should prove to be very valuable.
4. Review Procedures for IEEE Periodicals (see Item 1). The Publications Board (PUB) had noted, with concern, an IAS policy requiring presentation of a paper at an IAS conference as a prerequisite for Transactions publication. A similar PES policy was also noted. Many PUB members believed that the "conference presentation requirement", appeared to discriminate against non-U.S. authors.

As a result, a new policy was drafted which was presented and approved at the May 20 PUB meeting.

The new policy is shown on Item 1. Item B of this policy states, "The sponsoring Society will be responsible for ensuring an alternate method of presentation or review if an author cannot himself/herself make the presentation at the conference!

5. Technical Paper Presentations at Technical Committee Meetings (see Item 2). A proposal to allow the presentation of a maximum of three technical papers per year, per committee, at Technical Committee Meetings, which are held at locations and times differing from those of the PES General or Special Meetings, was discussed. The pros and cons of such a policy are given in Item 2. This proposal was discussed but no decision was made at the meeting.



Robert A. Veitch
Vice-Chairman/Publications Co-ordinator
Transformers Committee



Item 1

ADCOM-3
P3

IEEE

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
345 EAST 47TH STREET, NEW YORK, N.Y. 10017-2394, U.S.A. TELEX 236411

June 16, 1988

DIRECT NUMBER (212) 705-

TO: Technical Activities Board
FROM: Timothy N. Trick - Vice President, Publication Activities
SUBJECT: New Policy on Review Procedures for IEEE Periodicals -- ACTION

At its February 12 meeting, the Publications Board had noted, with concern, an Industry Applications Society policy requiring presentation of a paper at an IAS conference as a prerequisite for TRANSACTIONS publication. A similar Power Society policy was also discussed. Although both IAS and PES can arrange for alternate presentors for authors not able to attend a conference in person, many PUB members believed that the conference presentation requirement, unlike the traditional journal review process, appeared to discriminate against non-U.S. authors. It was therefore agreed that a new policy explicitly precluding such discrimination should be drafted and presented at the May 20 PUB meeting.

The proposed new Policy, shown overleaf, was approved at the May PUB meeting. Before seeking final approval from the Board of Directors, TAB's comments on the wording and content of the proposed policy are sought.

REASON:

Assure by means of an explicit policy that any review process involving conference presentation does not discriminate against non-U.S. authors.

PROPOSED ACTION:

Provide PUB with comments on the wording and content of the proposed new policy.

P R O P O S E D N E W P O L I C Y

6.20 - REVIEW PROCEDURES FOR IEEE PERIODICALS

All archival material published in IEEE periodicals must undergo peer review. Conference presentation by an author may be one method of peer review, but it may not be a requirement. Such a requirement discriminates against authors who cannot afford conference travel, unduly restricts the flow of information in a transnational organization, and, thus, is a disservice to the members. If conference presentation is a part of the review process, an alternate review process, which is not dependent on the author's ability to travel, must be offered.

For those few IEEE publications which link conference presentation to later journal publication, the following policies apply:

- A. All conference/journal papers will be selected on merit and appropriateness, not on the ability of the author to present his/her paper in person.
- B. The sponsoring Society will be responsible for ensuring an alternate method of presentation or review if an author cannot himself/herself make the presentation at the conference.
- C. The above policies will be made clear in both formal and informal communications with all prospective authors.

Item 2

Technical Paper Presentations
at Technical Committee Meetings

Proposal

To allow the presentation of a maximum of three Technical papers per year, per Committee, at Technical Committee Meetings which are held at locations and times differing from those of the PES General or Special Meetings. They would be reviewed and judged as are all other papers. The author would be given the right to request which type of meeting he would prefer for his presentation. The Technical Paper Coordinator, in conjunction with the Committee Chairman, would select which approved papers are to be presented at the Committee Meeting. After this presentation only, the paper would receive full Transactions status.

Pros

1. It would provide for the author a larger audience of uniquely informed listeners.
2. It would allow a much longer, more detailed presentation (if desired by the Committee) without interfering with other Committees.
3. It would stimulate more oral and written discussion.
4. It would relieve the meeting room scheduling problem at PES meetings.
5. It would encourage the submittal as IEEE papers of some of the better, more practical papers now being presented to other specialized conferences where the author, in the past, has been seeking the larger audience instead of the archival publication.
6. The Committee would assume the responsibility of providing a projector and screen as well as a meeting room.
7. Greater attendance by local members would be promoted for Committee meetings.

Cons

1. Transferring the presentation of Technical Papers to other locations would tend to weaken the PES General and Special Meetings and may cause some members to stop attending.
2. This procedure may lengthen the Committee Meeting, some of which, with adjunct meetings, are already three or four days long.
3. It would probably cause problems with availability of preprinted papers because of the skewed timing relative to publishing of other preprints (on the other hand, this spreading of the publishing period for preprints may provide some relief to Society Special Services).



IEEE

ATTACH
ADCOM-4

POWER
ENGINEERING
SOCIETY

TRANSFORMERS COMMITTEE

Please Reply To:

October 28, 1988

CHAIRMAN
Olin R. Compton
Virginia Power
Grayland
P.O. Box 2666
Richmond, VA 23261

VICE CHAIRMAN
Robert A. Veitch
Ferranti - Packard Transformer
121 Industry St.
Toronto, Ont. Can. M6M 4M3

SECRETARY
John J. Bergeron
Louisiana Power and Light
P.O. Box 60340
New Orleans, LA 70160

SUBCOMMITTEE CHAIRMEN:

AUDIBLE SOUND and VIBRATION
Allan M. Tepitsky
Consolidated Edison
4 Irving Place Rm. 306 S
New York, New York 10003

BUSHINGS
Loren B. Wagenaar
American Electric Power
One Riverside Drive
Columbus, OH 43215

**HVDC CONVERTER
TRANSFORMERS and REACTORS**
William N. Kennedy
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

DIELECTRIC TESTS
Robert E. Lee
Pennsylvania Power & Light
P.O. Box 3328
Allentown, PA 18106-3328

DRY TYPE TRANSFORMERS
Roy E. Uptegraff, Jr.
R. E. Uptegraff Mfg. Co.
P.O. Box 182
Scottsdale, PA 15683

INSTRUMENT TRANSFORMERS
Ralph B. Stetson
General Electric Co.
30 Main St.
Somersworth, NH 03878

INSULATION LIFE
Dave H. Douglas
Centerior Energy Corp.
P.O. Box 5000
Cleveland, OH 44101

INSULATING FLUIDS
Henry A. Pearce
Westinghouse Electric Corp.
469 Sharpsville Ave.
Sharon, PA 16146

**PERFORMANCE
CHARACTERISTICS**
John D. Borst
Westinghouse Electric Corp.
P.O. Box 883
Jefferson City, MO 65102

RECOGNITION and AWARDS
Dean A. Yannucci
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

TRANSFORMER STANDARDS
James H. Harlow
Siemens Energy and Automation
P.O. Box 6289
Jackson, MS 39208

WEST COAST
Dennis W. Gerlach
Salt River Project
P.O. Box 52025
Phoenix, AZ 85072-2025

To: IEEE Adcom Committee and Transformer Committee

Subject: Awards Subcommittee's Report

The following awards have been selected and processed:

1. PES Prize Paper Award nomination.

"A Refined Mathematical Model for Prediction of Bubble Evolution in Transformers"

W. A. Fessler
T. O. Rouse
W. J. McNutt
O. R. Compton

2. Technical Committee Prize Paper recipient.

"A Refined Mathematical Model for Prediction of Bubble Evolution in Transformers"

W. A. Fessler
T. O. Rouse
W. J. McNutt
O. R. Compton

3. Technical Committee Distinguished Service Award

O. R. Compton


4. Technical Committee Working Group Recognition Award

Working Group on Harmonic Load Current Heating
Chairman - W. J. McNutt

The selection process for the Baker, Fink and Thompson Awards will be reviewed prior to April 1, 1989.

5. Transformer Committee Certificate of Appreciation Awards have been requested for:

R. A. Veitch
O. R. Compton
D. A. Yannucci


D. A. Yannucci, Chairman
Awards Subcommittee

ajm:0789R



ATTACH
ADCOM-5 POWER

ENGINEERING
SOCIETY

TRANSFORMERS COMMITTEE

Please Reply To:

8 July, 1988

CHAIRMAN
Olin R. Compton
Virginia Power
Grayland
P.O. Box 2866
Richmond, VA 23261

VICE CHAIRMAN
Robert A. Veitch
Ferranti-Packard Transformer
121 Industry St.
Toronto, Ont. Can. M6M 4M3

SECRETARY
John J. Bergeron
Louisiana Power and Light
P.O. Box 60340
New Orleans, LA 70160

SUBCOMMITTEE CHAIRMEN:

AUDIBLE SOUND and VIBRATION
Allan M. Tepinsky
Consolidated Edison
4 Irving Place Rm. 306 S
New York, New York 10003

BUSHINGS
Loren B. Wegener
American Electric Power
One Riverside Drive
Columbus, OH 43215

**HVDC CONVERTER
TRANSFORMERS and REACTORS**
William N. Kennedy
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

DIELECTRIC TESTS
Robert E. Lee
Pennsylvania Power & Light
P.O. Box 3328
Allentown, PA 18106-3328

DRY TYPE TRANSFORMERS
Roy E. Uptegraff, Jr.
R. E. Uptegraff Mfg. Co.
P.O. Box 82
Scottsdale, PA 15683

INSTRUMENT TRANSFORMERS
Ralph B. Stetson
General Electric Co.
30 Main St.
Somersworth, NH 03878

INSULATION LIFE
Dave H. Douglas
Centeror Energy Corp.
P.O. Box 5000
Cleveland, OH 44101

INSULATING FLUIDS
Henry A. Pearce
Westinghouse Electric Corp.
469 Sharpville Ave.
Sharon, PA 16146

**PERFORMANCE
CHARACTERISTICS**
John D. Borst
Westinghouse Electric Corp.
P.O. Box 883
Jefferson City, MO 65102

RECOGNITION and AWARDS
Dean A. Yannucci
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

TRANSFORMER STANDARDS
James H. Harlow
Siemens Energy and Automation
P.O. Box 6289
Jackson, MS 39208

WEST COAST
Dennis W. Gerlach
Salt River Project
P.O. Box 52025
Phoenix, AZ 85072-2025

TRANSFORMERS COMMITTEE REPORT TO THE IEEE/PES TECHNICAL COUNCIL

The Transformers Committee continues to operate smoothly and productively.

Due to retirements and work assignment changes, the IEEE Delegation to ANS CS7, Transformers has been reorganized. Only one former member has been retained.

Committee membership remains stable.

A very successful Spring Meeting was held in Washington, DC in April. We will meet in Long Beach, CA, November 6-10.

Other scheduled meetings include:

April 2-5, 1989

Fall, 1989

March 25-28, 1990

October 21-24, 1990

Spring, 1991

Chicago IL

Charlotte NC

Denver, CO

Montreal, Que.

Phoenix AZ?

Drake Hotel

Adamhost Hotel

Denver Marriott Hotel

Scope revisions and/or reaffirmations are nearly complete.

Nominations for new officers for the Committee, some new subcommittee chairmen, and reaffirmation for the other subcommittee chairmen will be considered at the Long Beach Meeting.

Respectfully submitted,

Olin Compton

WEST COAST TRANSFORMER SUBCOMMITTEE

MEETING MINUTES

LONG BEACH, CALIFORNIA
NOVEMBER 1, 1988

The meeting was called to order at 10:10 AM by the Chairman, Dennis Gerlach, with ten members and two guests.

-Approval of Previous Meeting Minutes-

There were no changes to the previous meeting's minutes of February 18, 1988. The minutes were therefore approved.

-New Membership-

Denise Roth requested membership into the subcommittee. The members voted and passed Ms. Roth's membership into the subcommittee.

-Future Meetings-

The next meeting of the West Coast Transformer Subcommittee will be held in Phoenix, Arizona, February 15, 16, and 17. It will be held jointly with the West Coast Substation Subcommittee.

-Working Group Reports-

-Consolidation Guides: Jim Gillies reported that there were 10 attendees at the working group meeting. Denise Roth had combined ANSI C57.11 and 12. Bill Isberg and Lou Tauber are editing ANSI C57.93. The goal is that the two sections will be put together one month before the meeting in Phoenix. The working group should have a chance to examine the entire standard before the meeting. The working group should be able to ballot the standard at the next meeting. Mr. Gillies said that he had talked to Mr. Compton, and that the plan to have the standard in two separate sections is acceptable. In summary, the first complete draft should be put together for the Phoenix meeting, with the standards to be completed approximately one year later.

-Fire Protection Guide: Denise Roth reported for Herb Johnson, the Chairman of the Fire Protection Guide, that progress is being made, and that outlines have been made. The PAR was returned, questioning if this guide could not be combined with the Substation Fire Protection Guide. The response will be that this guide covers indoor transformer applications, and will also contain transformer selection information. Mr. Harlow, the IEEE Standards representative attending the subcommittee meeting felt that this would be sufficient.

-Seismic Guide: Samuel Oklu, the chairman of the Seismic Guide reported that there were 6 members and 2 guests at the working group meeting. Draft 17 was discussed. Of the Main Committee ballots sent for voting, the distribution was as follows:

100 qualified Voters
67 Approved
3 Disapproved
12 not voting - no expertise in this area

An examination was made of the three negative votes. Responses to these votes were formulated.

Draft 14 has been balloted by the Main Committee and passed with 78% response. The one negative ballot was cleared. Editorial changes to the draft were reviewed. Draft D14 will be forwarded to the Standards Board.

-Old or New Business-

There was no old or new business to discuss.

-Topics of Discussion-

Destructive Testing of Transformers: Dave Sundin gave a short Narrative about tests performed on a pole mount transformer, which was followed by a ten minute video tape.

General Comments:

- The next meeting in Phoenix will have discussion on desolved gas in oil screening, and transformer temperature.

The meeting was adjourned at 11:20 AM.


Dennis Gerlach, Chairman
West Coast Transformer Subcommittee

PERFORMANCE CHARACTERISTICS SUBCOMMITTEE

Long Beach, CA - November 1, 1988
MEETING MINUTES

I. INTRODUCTION/ATTENDANCE

The Performance Characteristics Subcommittee (PCS) met at 11:15 AM on Tuesday, November 1, with 37 members and 39 guests registering their attendance.

II. APPROVAL OF MINUTES

The minutes of the April 12, 1988 PCS Meeting were approved as previously submitted.

III. CHAIRMAN'S REMARKS

1. Effective January 1, 1989, John W. Matthews of Baltimore Gas and Electric will become Chairman of the PCS.

I am grateful for the support received from PCS members during the last six years and am confident that support will be extended to John.

2. Liaison Reports

- a. Dave Smith, PTI, presented his liaison report on the activities for the "Network Transformer Protection Working Group" of the IEEE Power Systems Relaying Committee (Attachment PCS-A).

- b. A preliminary request for liaison from the Switchgear Committee has been identified. The subject of interest is ANSI/IEEE C37.36B - Guide to Current Interruption with Horn Gap Air Switches (Attachment PCS-B). John Matthews will pursue the need for formal liaison.

3. The portion of the Standards Subcommittee Report pertaining to PCS projects is attached for review (Attachment PCS-C).

4. Subsequent to the meeting, Dennis Marlow (Federal Pioneer) and Jim Sim (NEI Ferranti-Packard) were added to the PCS roster.

IV. AGENDA CHANGES

None identified.

V. WORKING GROUP REPORTS

1. Transformers Directly Connected to Generators - B.K.
(Bipin) Patel

Since the approved Guide (C57.116) was submitted to the Standards Board in May, the Working Group did not meet at this meeting. Final disposition was not known at this time.

2. Test Code For Shunt Reactors (C57.21) - J.W. (Jack) McGill

This working group met at 3:05 PM on October 31, 1988, with eleven (11) persons present; seven (7) members and four (4) guests.

The results of balloting C57.21/D7 in the Performance Characteristics Subcommittee are as follows; 55 ballots were sent out and 44 were returned (80%).

Approved without comments	12
Approved with comments	21
Negative Vote	1
Not Voting	10
No Response	11
Total	<u>55</u>

The one negative vote requested that correction techniques for losses be minimized and that the copper losses be reported at a temperature of 20°C and not corrected to the guaranteed losses, established at temperatures of 75°C or 85°C, depending upon rating.

This working group did not accept this suggestion for the following reasons:

- 1) Transformer standards presently state that, 75/85°C are the temperatures for correcting load losses (including copper loss).
- 2) Guaranteed losses are based on 75/85°C temperatures.
- 3) 20°C is not an operating temperature.

The Chairman will discuss the W.G.'s decision with the negative voter to try to obtain resolution.

Page 3
Performance Characteristics Subcommittee

The remaining portion of this meeting was used to accept or reject the many comments received from the balloting. The following are some of the major conclusions based on the W.G. discussions:

- The word "Rated" will be inserted into the title to read "Requirements, Terminology & Test Code for Shunt Reactors Rated Over 500 kVA".
- Conventional coordinates were clarified on the magnetic characteristics curve.
- Two tables, 4A & 4B, will remain; one for oil-immersed & one for dry-type shunt reactors.
- Some wording will be modified on each 4A or 4B table to clarify the various tests listed.
- Several paragraphs, which are similar to the Transformer Standards, will be added to establish temperature limitations on measuring cold resistance.
- A mechanical pressure relief device will be added to the standard list of accessories. The fault pressure and gas accumulation relay will not be standard.
- A paragraph was added which states that the core ground connection should be accessible without removing any oil from the shunt reactor.
- Loss measurements, acoustical measurements, vibration and temperature rise tests are specified to be made at full voltage and current unless the manufacturers test facilities are not adequate for full testing. Under these conditions the manufacturer is permitted to test at reduced voltage and current, as well as single phase, provided the test results have been mutually acceptable to both user and manufacturer.
- There were numerous editorial changes.

The corrections approved in the dielectric and the dry-type task forces, discussed in previous meetings, will be incorporated into this standard. When all these corrections have been collected and approved, a draft #8 will be established and balloted in the Main Transformers Committee. This could occur before our next meeting.

Page 4
Performance Characteristics Subcommittee

3. Failure Analysis - W.B. (Wally) Binder, Jr., for D.J. (Don) Cash

The Working Group met at 1:00 PM on October 31, 1988. There were 28 members and 25 guests present. Chairman Don Cash was unable to attend the meeting. In his absence, Wally Binder, T.F. Chairman, conducted the meeting.

The results of balloting Draft 6 of C57.125 were reported as follows:

53 ballots mailed
33 ballots returned
1 ballot to Subcommittee Chairman

16 ballots returned approved
12 ballots returned approved w/comment
2 ballots returned not approved
3 ballots returned not voting

Prior to the Working Group meeting, the negative ballots were discussed in an attempt to gain resolution.

The changes to Draft 6 which were the result of resolving the negative ballots and which incorporated all comments received were reviewed. These changes resolved the negative ballots.

After complete review of the proposed changes, the Working Group voted in favor of submitting the next draft to the Performance Characteristics Subcommittee.

4. Loss Tolerance and Measurement - W.R. (Bill) Henning

The Work Group on Loss Tolerance and Measurement met October 31, 1988, at 3:05 PM, with 26 members and 15 guests present. After approval of the previous meeting minutes, there was a report of the Loss Measurement Guide Task Force. The Task Force is rewriting Section 9 of C57.12.90, and the topics centered on points that need to be resolved so the draft can be written.

The first item of discussion was whether or not to impose a 5% limit on correction for phase angle error in the test system. After much discussion involving the stability of corrections and how to account for the calibration uncertainty, the general feeling of the Task Force and the Working Group was that the 5% limit on correction should be part of the proposal.

Page 5
Performance Characteristics Subcommittee

A second item of discussion was the requirement for temperature conditions during the loss test. For transformers larger than 2500 kVA, it was agreed that the present wording is adequate. For distribution transformers, Jeewan Puri agreed to define the requirements for temperature measurement.

A third item for discussion was problems encountered conducting the test with three phase excitation while measuring losses one phase at a time with single phase instrumentation.

At the Work Group meeting it was decided to make agreed to changes in Section 9 and then conduct a ballot. Jim Tingen has agreed to rewrite Section 5 on resistance measurement.

A proposal for a tolerance on measurement accuracy was handed out at the meeting. It was agreed that this should also be added to C57.12.00.

It was decided to prepare a ballot as follows:

- a. Section 5 of C57.12.90 (resistance)
- b. Section 8 of C57.12.90 (no-load losses)
- c. Section 9 of C57.12.90 (load losses)
- d. Tolerance on measurement accuracy for C57.12.00
- e. 20°C reference temperature for no-load losses in C57.12.00

The Working Group also discussed the project to make the resistance test a design test for distribution transformers larger than 500 kVA. This will be reballoted.

At the end of the meeting it was announced that Sam Mehta is resigning as Chairman of the Guide Task Force. Dr. R. Girgis has agreed to serve as the new Chairman.

5. Semi-Conductor Rectifier Transformers - S.P. (Sheldon) Kennedy for G.C. (Charlie) Pounds.

The Working Group met on Monday, October 31, 1988, with 12 members and 9 guests in attendance. In the absence of Chairman G.C. (Charlie) Pounds, Secretary Sheldon P. Kennedy chaired the meeting. The minutes of the April 11, 1988, meeting were approved as presented.

It was proposed to include a clause in the standard that total stray loss may be segregated into eddy current losses and other stray losses, if agreed upon beforehand by both user and manufacturer. It was also recommended that the

user supply the harmonic analysis to allow the manufacturer to calculate the effects of harmonics on the load losses. It was recommended that C57.110 be referenced as a method of analysis.

It was proposed that this harmonic analysis could then be used to test the capability of a transformer to deliver non-sinusoidal current. It was recognized that the obvious best way to perform this test would be to perform an actual load test with the transformer and rectifier coupled to the actual load and powered by rated voltage. This is also recognized as impractical. It was suggested to include two methods of testing with sinusoidal current capable of being performed in a manufacturer's test facility. These tests would be performed without the rectifier as follows:

Method A Test the transformer with only rated sinusoidal losses input. The results of this temperature rise test could be corrected for the harmonic losses calculated in each winding. The method of temperature rise correction will be in accordance with ANSI/IEEE C57.12.90 and C57.12.91 test codes.

Method B Input transformer losses equal to the rated sinusoidal losses plus the calculated harmonic losses. The results of this test will also have to be mathematically corrected for transformer winding, loading and harmonic loss responsibility.

While it was recognized that this method will not be entirely precise, it is felt that it may be the most appropriate way to simulate the actual conditions by test in a practical and reasonable manner. It will certainly be a great step forward over our present standards.

A more precise definition of acceptance is sought on rectifier transformer overload capability. It was felt that the terms "without damage" or "without injury" were ambiguous. It was also believed that to give an absolute temperature limit could be inappropriate depending upon the application. Roger Hayes will reword this section to incorporate the loading guides as tools for evaluation. It will also be recommended to use RMS equivalent currents in lieu of the actual stepped overload current profiles. This allows the testing to be more feasible. It was also recognized that end point testing for temperatures were inaccurate when the current was still ramping the temperature upward.

It was recognized that we have not accurately defined a method of short-circuit testing. We presently are referring to the short-circuit test standard. Some rectifier transformers may be subject to DC current contributions as well as AC current fault levels. This determination would take a complete analysis of 50 to 60 circuits. This burden plus the difficulty in performing such a test presently is monumental. It was decided to reference this fact in the forward acknowledging that this standard does not address all of the possible areas where short circuit forces may be present. However, due to lack of concurrence at this time on this subject, we cannot fully address this presently. Further work on this topic should be carried on. This information could be incorporated into an appendix to this work. The HVDC Converter Group's approach utilizes only the short circuit test guide. However, they do not have all of the circuits present as in the rectifier standard.

A question was raised regarding the proper BIL level and dielectric test requirements of rectifier transformers. It was recommended to reference ANSI/IEEE C57.12.00 and C57.12.01 as required to determine these levels. We will incorporate a note into this wording acknowledging that some applications may require higher BIL levels for operation. Impulse testing for DC windings will still be excluded since there is no adequate way to test certain types of rectifier transformer circuits.

Plans are to review Draft 6 incorporating the above changes and send it out to the Working Group for comment as Draft 7 before the Chicago Meeting.

6. Qualification of Transformers for Class 1E Application in Nuclear Power Stations - L.B. (Len) Stensland

The Working Group met on October 31 and November 1, 1988, with 5 members present.

Of the 147 ballots sent out for Draft 16 of P. 638, 125 ballots were returned, subdivided as follows:

90	affirmative
12	conditional affirmative
9	negative
14	waived
<u>125</u>	

The Working Group reviewed the conditional affirmative and negative ballots. They hope to resolve all comments very shortly. At that time they will decide whether a re-ballot will be required.

VI. PROJECT REPORTS

1. LTC Position Indication - R.H. (Bob) Frazer

Bob provided a summary of results of a 1985 survey concerning standardization of LTC tap position indication (Attachment PCS-D) and a proposal for addressing various conditions (Attachment PCS-E).

Bob will conduct a PCS ballot on his proposal and will submit a Project Authorization Request (PAR).

2. Nameplate Information Change Request - J.W. (John) Matthews

No progress to report.

3. Task Force - LTC Performance Requirements - T.P. (Tom) Traub

The LTC Performance Requirements Task Force met for the first time at 3:05 PM on Monday, October 31, 1988, with 13 members and 7 guests in attendance.

The meeting began with a discussion by the Chairman of the reasons for the formation of this new Task Force. Present ANSI Standards on load tap changers cover such mechanical requirements as liquid level gauges, operations counters, sizes of drain valves and position indicators. There are, however, no IEEE Standards that cover such performance requirements as rated current, allowable temperature rise, rated voltage or mechanical operating capability. The load tap changers of some manufacturers comply fully with IEC214, which covers performance requirements for load tap changers, while others only partially comply.

At last April's meeting, the Administrative Subcommittee approved the formation of a Task Force to investigate performance requirements for load tap changers. The Task Force's initial efforts were directed towards the two following areas:

The first is to review IEC 214 to determine if it can be adopted as an IEEE Standard.

PCS7.12.00 h

PCS7.12.00 i

→ WG

The second is to define the scope and purpose of the Task Force for the possible development of a Standards Project Authorization.

A copy of the latest version of IEC 214 had been sent to the Task Force members for review prior to the meeting. It was concluded at the meeting that the IEC Standard cannot be adopted as an IEEE Standard. The main reason is because the IEC Standard is directed mainly towards resistance type load tap changers and does not give sufficient attention to the reactance type. There was also some discussions about whether the IEC categories of a load tap changer's environment as being either in "air" or in "oil" apply to most load tap changers installed in North America. This subject will be discussed further within the Task Force.

1 Approved
9 Negative
1 Not Voting
→ IEC 214 will be made a basis of the new document.
IEC does not cover performance requirements adequately.
IEC covers requirements for environment should not. Each comment conditions are sufficient.

In addition to needing a new IEEE Standard for load tap changers, it was also the opinion of the Task Force that a test code should be part of such a standard, but that application information would not be included.

The Task Force proposes to proceed as follows: the latest version of IEC 214 will be balloted as Draft #1 within the Task Force. The members will be asked to identify those portions of the IEC Standard that they agree or disagree with. This will then serve as the beginning of an outline for the new IEEE Standard. The members will also identify and provide new wording for those areas that need to be added. The ballot will be sent out shortly with the goal of discussing the comments at the next meeting, and the preparation of a second draft following the next meeting.

Regarding the scope and purpose of the project, the Chairman agreed to prepare a proposed scope and purpose which will be sent to each member prior to, and then discussed at, the next meeting.

At the PCS Meeting it was agreed that the Administrative Subcommittee would be requested to elevate the Task Force to a Working Group. Development of a PAR is an identified future task.

VII. OLD BUSINESS

There was no old business.

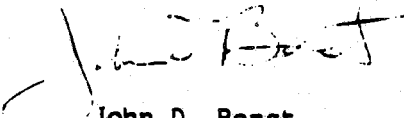
Page 10
Performance Characteristics Subcommittee

VIII. NEW BUSINESS

There was no new business.

IX. NEXT MEETING

The next meeting will be held on Tuesday, April 11, 1989 in Chicago. The PCS Meeting was adjourned at 12:10 PM.


John D. Borst
PCS Chairman

1403:lw

POWER TECHNOLOGIES, INC.

CASTLE MAIN SUITE 219 WILMERSDING, PA. 15148-1280
(412) 824-2488 TELEFAX (412) 824-3845 TELEX 145498

October 4, 1988

Mr. J. D. Borst
Westinghouse Electric Corporation
P. O. Box 883
Jefferson City, MO 65102

Dear John:

Enclosed is my liaison report on the Activities of the "Network Transformer Protection Working Group" of the IEEE Power Systems Relaying Committee.

You will note from the report that I cast a negative ballot on Draft 9. Draft 9 was the first version where I was given the opportunity to vote, although I recently learned I should have been involved in all previous ballots on the Guide.

For your information, a copy of my reasons for the negative vote along with suggested changes to resolve the negative vote are attached.

If you have any questions on the enclosed, please give me a call.

Sincerely yours,

David R. Smith

David R. Smith

DRS:fm

Enclosure

LIAISON REPORT

**Network Transformer Protection Working Group
Substation Protection Subcommittee**

IEEE Power Systems Relaying Committee

Draft 8 of the "Guide for the Protection of Network Transformers," Project P1056, was balloted at the Power System Relay Committee and four negative ballots were received. Draft 9 was prepared and resolved the four negative votes on Draft 8. As the coordinator of this document from the Transformers Committee, I was asked for the first time on June 8, 1988, to submit a ballot on Draft 9.

I submitted a negative vote as there were statements in Draft 9 which were technically incorrect. The reasons for my negative vote have been given in writing to the chairman of the Working Group responsible for the document, along with suggested changes to resolve the negative vote.

The Guide is intended to aid in the effective application of relays and other devices for the protection of network transformers and other equipments in the 480-volt spot network systems. It is my opinion that the Guide will not impact the standards for network transformers.

D. R. Smith
Power Technologies, Inc.
10/04/88

ATTACHMENT PCS-B



A-11/88-D
P 13

RUTHERFORD BUSINESS CENTER • BALTIMORE, MARYLAND 21203-1475

ELECTRIC TEST DEPARTMENT

September 6, 1988

Mr. J. D. Borst
Westinghouse Electric Corp.
P.O. Box 883
Jefferson City, MO 65102

SUBJECT: ANSI/IEEE C37.36B - Draft 5, Guide to Current
Interruption with Horn Gap Air Switches

Dear John:

I have attached a copy of the Subject Guide, which I received from Mr. Alexander Dixon.

Mr. Dixon has recently assumed chairmanship of the Working Group which is developing this Guide. No formal liaison has been established with the IEEE Transformers Committee. He is requesting our opinion regarding the need for formal liaison.

Please review the Guide and let me know your opinion at your earliest convenient time.

Thank you for your attention.

Yours truly,

John W. Matthews
Senior Engineer

JWM/mdh

Subcommittee: Performance Characteristics
Subcommittee Chairman: John D. Borst (314/634-2111)

<u>IEEE NO.</u>	<u>ANSI NO.</u>	<u>WG/TF CHAIRMAN</u>	<u>IDENTIFICATION</u>	<u>PAR ON FILE TRANS COMPI.</u>	<u>AS OF/STATUS</u>	<u>COORD.</u>
P638	None	L.R. Stensland	Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Yes	4/8/88 - D/16 submitted to ballot of main committee	NPE SUB
	PCS7.18.18	C.G. Pounds	Practices and Requirements for Semiconductor Power Rectifier Transformers	Yes (6/81)	4/11/88 - D/6 discussion by working group	None
	PCS7.21	J.W. McGill	Requirements, Terminology, and Test Code for Shunt Reactors over 500 KVA	Yes (6/88)	6/9/88 PAR Approved 4/11/88 - D/7 being prepared	RM T&D PSR
P785	PCS7.116	B.K. Patel	Guide for Transformers Directly Connected to Generators	Yes (2/79)	5/25/88 - Document submitted to IEEE Std. Board	PG PSR RM NPE
P262 E3	PCS7.12.98 e3	W.R. Henning	CS7.12.98e3 - Revision of CS7.12.98 Section 8 - "No Load Losses and Exciting Current"	No	4/11/88 - Complete - Awaiting Section 9 rework.	?
P262 E2	PCS7.12.98 e2	W.R. Henning	Revision of CS7.12.98 Section 8.3.3	No	4/11/88 - D/8 approved by TC 1985. Text held pending CS7.12.98e3 project.	?
P262 E1	PCS7.12.98 e1	W.R. Henning	Addition to CS7.12.98 Section 8	No	4/11/88 - D/4 text being held pending CS7.12.98e3 project.	?
P262 E	PCS7.12.98e	W.R. Henning	Revision of CS7.12.98 Section 9 - Load Loss and Impedance Tests	No	4/11/88 - Draft discussed by WG.	?
P1898	PCS7.123	W.R. Henning	Guide for Transformer Loss Measurement	Yes (3/85)	4/11/88 - Work awaiting conclusion of CS7.12.98e	PSIM
P462C	PCS7.12.88	W.R. Henning	Supplement for Allowable Loss Tolerances and Methods of Loss Measurements	No	11/3/87 - Proposal pending round-robin test.	?
	PCS7.125	D.J. Cash	Guide for Failure Investigation, Documentation and Analysis for Power Transformers and Shunt Reactors	Yes (2/87)	4/11/88 - Seeking resolution of negative ballots on D/5	T&D PGS PSE SMGR
		R. H. Frazer	TF - LTC Position Indication	No	4/11/88 - Summary report issued	
	PCS7.12.88i	J. W. Matthews	TF-Nameplate Information "Directed Flow"	Yes (12/86)	4/11/88 - Awaiting input from Loading Guide WG.	
		C. J. McMullen	TF-Routine Resistance Test CS7.12.88k, Table 14	No	4/11/88 - To be considered by Herring WG.	
		T. P. Traub	TF-LTC Performance Reports	No	4/11/88 - Newly formed TF	

NOVEMBER 1, 1988

STANDARDIZATION OF LTC TAP POSITION INDICATION

A review of an earlier survey (1985) showed the following suggestions:

(1) LTC taps should be labeled so that a number followed by the suffix "R" or "L" would designate the output voltage of the transformer. The "R" or "L" would indicate an increase or decrease respectively in output voltage with the number increasing to show greater increase or decrease in voltage.

(2) No one system will satisfy all conditions. There should be options with the user specifying the correct choice.

(3) Relate tap indication to raise or lower of voltage in winding where such control is specified. This could be either primary or secondary.

(4) The "Raise/Lower" directions should be referenced to the regulated voltage, not the low or secondary voltage.

(5) Number tap changer positions such that increasing the tap position will reduce the turns ratio. Direction of changing taps would be labeled according to the effect on the secondary voltage according to the application of the transformer.

Proposal for inclusion in next revision of C57.12.00 "Nameplate Information", Note section:

(additional wording)

LTC TAP DESIGNATION CASE #1 - IF TRANSFORMER IS EITHER STEP UP OR STEP DOWN WITH THE LTC TAPS IN THE PRIMARY OR SECONDARY WINDING, AND THE PURPOSE OF THE LTC IS TO ADJUST TURNS IN THE LTC WINDING TO PROVIDE A VARIABLE VOLTAGE (OR A REGULATED CONSTANT VOLTAGE) AT THE SECONDARY TERMINALS, THE FOLLOWING TAP DESIGNATION SHALL BE USED :

(Present wording)

The normal position shall be designated by the letter N for load-tap-changers. The raise range positions shall be designated by numerals in ascending order, corresponding to increasing output voltage, followed by the suffix R, such as 1R, 2R, etc. The lower range positions shall be designated by numerals in ascending order, corresponding to decreasing output voltage, followed by the suffix L, such as 1L, 2L, etc. (this applies to the relationship between two windings of a transformer only, such as the H and X windings).

(additional wording)

LTC TAP DESIGNATION CASE #2 - IF TRANSFORMER IS EITHER STEP UP OR STEP DOWN WITH THE LTC TAPS IN THE PRIMARY WINDING, AND THE PURPOSE OF THE LTC IS TO ADJUST TURNS IN THE PRIMARY WINDING TO COMPENSATE FOR VARIABLE INPUT VOLTAGES WHILE MAINTAINING A CONSTANT VOLTAGE AT THE SECONDARY TERMINALS, THE FOLLOWING TAP DESIGNATION SHALL BE USED :

(additional wording)

THE NORMAL POSITION SHALL BE DESIGNATED BY THE LETTER N FOR LOAD-TAP-CHANGERS. THE RAISE RANGE POSITIONS SHALL BE DESIGNATED BY NUMERALS IN ASCENDING ORDER, CORRESPONDING TO INCREASING INPUT VOLTAGE, FOLLOWED BY THE SUFFIX R, SUCH AS 1R, 2R, ETC. THE LOWER RANGE POSITIONS SHALL BE DESIGNATED BY NUMERALS IN ASCENDING ORDER, CORRESPONDING TO DECREASING INPUT VOLTAGE, FOLLOWED BY THE SUFFIX L, SUCH AS 1L, 2L, ETC.

(additional wording)

LTC TAP DESIGNATION CASE #3 - IF TRANSFORMER IS USED IN APPLICATIONS SUCH THAT EITHER WINDING MAY BE CONSIDERED THE PRIMARY WINDING ACCORDING TO VARIABLE LOAD FLOWS, THE NAMEPLATE MARKINGS SHALL BE SPECIFIED BY THE USER.

Robert N. Jager



IEEE

TRANSFORMERS COMMITTEE

ATTACH.
11/88-E
p1 of 2

POWER
ENGINEERING
SOCIETY

Please Reply To:

CHAIRMAN
Olin R. Compton
Virginia Power
Grayland
P.O. Box 2666
Richmond, VA 23261

VICE CHAIRMAN
Robert A. Veitch
Ferranti-Packard Transformer
121 Industry St.
Toronto, Ont. Can M6M 4M3

SECRETARY
John J. Bergeron
Louisiana Power and Light
P.O. Box 60340
New Orleans, LA 70160

SUBCOMMITTEE CHAIRMEN:

AUDIBLE SOUND and VIBRATION
Allan M. Teplitsky
Consolidated Edison
4 Irving Place Rm. 306 S
New York, New York 10003

BUSHINGS
Loren B. Wagenaar
American Electric Power
One Riverside Drive
Columbus, OH 43215

**HVDC CONVERTER
TRANSFORMERS and REACTORS**
William N. Kennedy
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

DIELECTRIC TESTS
Robert E. Lee
Pennsylvania Power & Light
P.O. Box 3328
Allentown, PA 18106-3328

DRY TYPE TRANSFORMERS
Roy E. Uptegraff, Jr.
R. E. Uptegraff Mfg. Co.
P.O. Box 182
Scottsdale, PA 15683

INSTRUMENT TRANSFORMERS
Ralph B. Stetson
General Electric Co.
30 Main St.
Somersworth, NH 03878

INSULATION LIFE
Dave H. Douglas
Centerior Energy Corp.
P.O. Box 5000
Cleveland, OH 44101

INSULATING FLUIDS
Henry A. Pearce
Westinghouse Electric Corp.
489 Sharpville Ave.
Sharon, PA 16145

**PERFORMANCE
CHARACTERISTICS**
John D. Borst
Westinghouse Electric Corp.
P.O. Box 883
Jefferson City, MO 65102

RECOGNITION and AWARDS
Dean A. Yannucci
Westinghouse Electric Corp.
651 Holiday Drive
Pittsburgh, PA 15802

TRANSFORMER STANDARDS
James H. Harlow
Siemens Energy and Automation
P.O. Box 6289
Jackson, MS 39208

WEST COAST
Dennis W. ...
Salt River ...
P.O. Box 620 ...
Phoenix, AZ ...

October 12, 1988

To: Subcommittee Chairmen

Subject: New Standardized Thermal Equation Symbols

Gentlemen:

In February of 1988 the following Joint Task Force was formed to finalize a new set of standardized symbols for use in transformer loading guides and associated guides:

- Bill Wrenn
- Bob Grubb
- Bill Mutschler
- John Borst
- Bob Veitch
- Egon Koenig

Attached is a list of the new symbols which have been agreed to and indications of changes which need to be made in various loading guides. The IEC has taken major steps to nearly conform to these new symbols.

This completes the assignment given to me in the Fall of 1986 by Dean Yannucci, while chairman of the Transformer Committee.

Very truly yours,

Dave Douglas

David H. Douglas
Chairman
Insulation Life Subcommittee

Attachment

cc: Joint Task Force
Olin Compton
John Bergeron
Dean Yannucci

ATTACH.
11/88-E
p2 of 2

NEW STANDARDIZED THERMAL EQUATION SYMBOLS
IEEE TRANSFORMER COMMITTEE
OCTOBER 1988 - D. H. DOUGLAS

○ Indicates a Non Standard Symbol

Current Loading Guide Symbols

Quantity	CS7.92	IEEE 756	CS7.91	CS7.96 Dry Type	IEC Dry Type	IEC 354	New IEC 354 Draft #6	New Standard
	θ°C	θ°C	θ°C	θ°C	θ°C	θ°C	θ°C	θ°C
Temperature	θ	θ	θ	θ	θ	θ	θ	θ
Temperature Rise	θ	θ	θ	θ ^{°K}	θ	θ	Δθ ^{°K}	Δθ
Ambient Temp.	θ _a	θ _a	θ _a	θ _a	θ _a	θ _a	θ _a	θ _a
Hottest Spot Winding Temp.	θ _{hs}	θ _{hs}	θ _{hs}	θ _h	θ _{wh}	θ _c	θ _h	θ _h
Hottest Spot Winding Rise Over Top Oil	θ _g	θ _g	θ _g	-	-	Δθ _c	Δθ _h ^{°K}	Δθ _h
Average Winding Rise Over Amb.	-	-	θ _w	θ _c ^{°K}	Δθ _w	Δθ _R	Δθ _w ^{°K}	Δθ _w
Average Winding Rise Over Ave. Oil	-	-	-	-	-	θ _{wo}	g	-
Bottom Oil Temp. Rise Over Amb.	-	-	-	-	-	-	Δθ _b ^{°K}	Δθ _b
Top Oil Temp. Rise Over Amb.	θ _o	θ _o	θ _o	-	-	Δθ _b	Δθ _o ^{°K}	Δθ _o
<u>Other Subscripts</u>								
Rated	fl	fl	r	o	r	r	r	r
Ultimate	u	u	u	u	-	-	-	u
Initial	i	i	i	i	-	-	-	i
Winding	-	-	w	w	-	-	-	w
Oil	-	-	-	-	-	-	-	o
Hot Spot Stray Flux Factor	-	-	-	-	-	-	H	H
Transformer Thermal Capacity	C	C	C	C	-	-	-	C
Ratio of Load Current to Rated Load Current	K	K	K	-	K	k	K	K
Ratio of Load Loss at Rated to No Load Loss	R	R	R	-	-	d	R	R
Duration of Load in Hours	t	t	t	t	t	t	t	t
Time Constant	τ	τ	T	T	τ	τ	τ	τ
Change in Total Loss Due to Change in Volt-Amp. Load	P	ΔP	-	-	-	-	-	ΔP
Total Loss	P	P	P	-	-	-	-	P
Oil Exponent	n	n	n	-	-	x	x	n
Winding Exponent	m	m	-	a	γ	γ	γ	m

Meeting Minutes
Insulation Life Subcommittee
of the
IEEE Transformer Committee
at the
Ramada Renaissance Hotel
Long Beach, California
November 1, 1988

The Insulation Life Subcommittee met on Tuesday, November 1, 1988 at 2:10 p.m. A total attendance of 44 consisted of 22 members and 22 guests.

After introductions were made, the minutes of the previous meeting in Washington, D.C., were approved with a minor correction.

The Chairman indicated that Al Wurdack had to give up his Chairmanship of the Working Group on Thermal Evaluation due to a serious illness. The latest word on Al, however, is that he is doing much better. The new Chairman of the Working Group is Larry Lowdermilk of G.E. Hickory, N.C.

Three new members have been added to the Subcommittee: Lin Pierce, Bipin Patel and Jim Sim.

The Chairman reported that a project assigned to him to develop a set of standard symbols for transformer thermal equations has been completed. Copies of the list of standard symbols have been sent to all Subcommittee Chairmen and will be included in the minutes for this Transformer Committee Meeting. It was also indicated, at the Adcom meeting, that the list will be added to the Appendix of the Committees' Operating Manual.

A question raised by Steve Moore of ABB Electric at the last Subcommittee Meeting on developing a definition for the term "THERMAL DUPLICATE", used in ANSI C57.12.00-1988, Table 14, has been assigned for resolution to the Thermal Test Working Group. Chairman Bob Grubb has already assembled a Task Force of manufacturers and users to address this very sticky question.

The first Working Group report was given by Bill Wrenn, Chairman of the Working Group On Guides For Loading.

Bill reported that his Working Group met at 8:00 a.m. in the Ballroom V with 27 members and 22 guests present.

The minutes of the Washington, D.C., meeting were approved.

Two new members were added to the Working Group: Wallace Binder and Don Platts.

No report on the status of IEC 354 was given, as Jacques Aubin was not present.

C57.91, C57.92, C57.115 Combined Guide Preparation

It was noted that the trial-use guide C57.115 for transformers above 100 MVA, would probably not be published until the new combined guide is completed.

The work of combining the three existing guides into one is being divided among four Task Forces.

Foreword

The proposed Foreword was passed out at the Washington, D.C., meeting. Comments on that included:

Should the ANSI Standards be listed both in the Foreword and the References?

Should the reference to the -20°C ambient be changed to -30°C, as the tables go down to -30°C?

Other comments on the Foreword should be given to the Chairman.

General Section

John Matthews, Task Force Chairman for the General Section, presented the results of the Working Group Ballot of Draft 3 of Section 2-3; Scope, References and General.

With 56 percent of the ballots returned, there were 17 affirmative ballots, 3 of which had comments, and 4 negative ballots.

A detailed summary of the comments and reasons for negative ballots was presented.

Distribution Section

Dave Takach, Task Force Chairman for the Section on Distribution Transformers, presented the results of the Working Group Ballot of Draft 3 of Section 4, Distribution Transformers.

With 59 percent of the ballots returned, all were approved.

Most of the comments were editorial in nature.

It was noted that the tables did not use a variable oil time constant. The Task Force will investigate how much difference the use of a variable oil time constant would make in the table values.

Power Section

Jerry Grimes, Task Force Chairman for the Power Transformer Section, reported that the Task Force has been investigating the IEC formula that uses bottom oil temperature in calculating hot spot temperature. The results of an extensive literature search on this subject was presented by Linden Pierce.

It was noted that for directed flow transformers, where the top oil temperature of the bulk oil is approximately equal to the oil temperature at the top of the coil, the IEC formula does not offer any improvement. In this case, the IEC formula complicates testing, and is a more complex formula which does not improve the accuracy.

The Task Force will continue to investigate the formula for the non-directed flow case.

Appendices

Dan Perco, Task Force Chairman for the Appendix Section of the new combined guide, presented the results of the Working Group Ballot of Draft 3 of the Appendices.

Fourteen members voted to approve, seven with comments, and five did not approve the draft.

The comments from the not-approved ballots were discussed in the Working Group Meeting, with the following results:

The part of Appendix A, Gas Evolution, dealing with the differences between membrane conservator systems gas blanket systems will be deleted. Also the references will be updated.

The comments discussed in the meeting were as follows:

It was noted that the issues raised in Section 3.1, gas evolution etc., dealt primarily with large power transformers. It was decided to continue to list these issues in this section, but also to refer the reader to the Power Section for details.

It was decided to reword Section 3.1 (4) to make it clear that it referred to the temporary reduction of mechanical strength of conductor insulation that occurs at high temperatures.

The need for consistent equation numbering in all sections was noted.

It was decided to extend the range of ambient temperatures listed in Section 3.3.2 from a range of 0°C to 50°C to -30°C to 50°C in order to be consistent with the other proposed sections.

New, much more detailed equations with new exponents, were presented by Linden Pierce. These equations, which include corrections for resistance and oil viscosity changes, got a great deal of discussion in the meeting. Eventually, the working group agreed to ballot the proposal by the next meeting.

It was agreed that the part of Section 3.6 dealing with ratings with only part of the coolers in operation will be moved the Power Transformer Section.

The part of Section 3.7 dealing with water spraying practices during hot weather will be expanded to list some of the serious concerns that the group had with this practice.

No formal proposal on the definition of "directed flow" has been developed yet. There are many issues yet to be resolved, but a draft such as "the pumped oil from the heat exchangers is directed toward the principle windings" is being pursued.

It was agreed to leave Appendix E for 55°C rise transformers unchanged.

The Task Force agreed to review the 1.2 per unit current value in Appendix B.

It was noted that the Tables C5 through C14 in Appendix C, Selection of Transformer Size, were no longer correct. It was agreed to delete these tables as they are probably not being used.

After accomplishing much, the Working Group adjourned 20 minutes late at 10:10 a.m.

At this point in the Subcommittee Meeting the Chairman requested Bill McNutt to review the results of a session he had with Lin Pierce on Tuesday morning on the subject of thermal equations. He reported that possibly our equation even for non-directed flow may be just as accurate as those in the IEC guide. Bill indicated he will develop a curve for the determination of a stray flux factor (K) versus MVA and impedance to be used in place of the present 15°C hot spot allowance. He will provide copies of this curve to key manufacturers identified at the meeting for confirmation.

Bob Grubb, Chairman of the Working Group on Thermal Tests gave the second report.

They met on Monday, October 31, 1988 at 3:05 p.m. with 5 members and 9 guests in attendance. Following the introductions of those present, the minutes of the April 11, 1988 Washington, D.C., meeting were approved as written.

Old Business

Chairman Bob Grubb indicated that Draft 10 of Project P838, Recommended Procedures for Performing Temperature Rise Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Rating, originally intended for ballot to the Working Group and Subcommittee prior to this meeting, is now ready and will be in the mail shortly. This document includes a revised Tutorial Appendix explaining the rationale behind the procedures recommended. Members were urged to pay particular attention to the Tutorial Appendix since it is a relatively recent addition to this document.

Linden Pierce made a brief presentation on his review of the Loading Guide equations, including review of the IEC Loading Guide (IEC 354, Draft 6) and his conclusions. This material had been presented earlier in the day by Mr. Pierce to the Working Group on Guides for Loading. He stressed that the investigation was not complete, but that his conclusions were presented to generate discussion and identify areas for future study. He feels there is a serious need to be as accurate as possible, since utilities regularly require demonstration of specified overload requirements by test, or by calculation using the Loading Guide equations. The Loading Guide is thus becoming a contractual document. Mr. Pierce considers, among his conclusions, that this need for accuracy dictates use of a supplemental set of equations incorporating resistance changes with temperature, stray losses and viscosity corrections, as well as adding new exponents x and y for the variation in hot spot rise and oil rise with losses and new exponent z to correct winding temperature rise for changes in viscosity.

Discussion continued on several areas related to Mr. Pierce's investigation.

1. Adoption of the IEC practice of using bottom oil temperature as a reference for average winding temperature. While this may not result in an improvement in accuracy for non-forced oil flow or for non-directed forced flow, when directed oil flow is used, a bottom oil temperature reference could be more accurate. This is because the bulk top oil temperature will be artificially cooler than the oil in the windings because of the flow of cool oil outside the windings.
2. There is a need to encourage continued investigation in this area while proceeding with balloting of P383/D10. The document, in draft status is being used by many utilities, and it is important that it be published as soon as possible. Mr. Pierce indicated that there is enough data in Part A of P838/D10 to get all the exponent data, and the suggestion was accepted that a supplementary ballot be sent out, also for return prior to the next meeting, indicating how these exponents, as well as the

winding time constant, can be determined. Linden Pierce and Bill McNutt volunteered to draft wording for the items on this supplementary ballot.

New Business

Bob Grubb indicated that an associate who is working in the Insulating Fluids Subcommittee indicated that, in the work of revising the C57.104 gas guide, there is a table suggesting normal and abnormal ranges of combustible gas generation during factory temperature rise tests at rated load. The question was raised whether it may be advisable to include these values as a reference in P838, since it could assist in evaluating possible problems occurring during the testing. Frank Heinrichs reported that there have been negative ballots on the latest draft, and that it was conceivable that these values might have to be excluded because of difficulty in reaching agreement on limits. The consensus was not to include a Gas Guide reference at this time. Discussion also pointed out that limits for gas generation during testing at loads beyond nameplate were also needed, but it was concluded that drafting these for agreement will be very difficult.

The next item of new business involved the definition of "average winding rise". The term is used widely, but in a review of the standards by a number of members, the term did not seem to be defined adequately. It is usually accepted that the term refers to the average temperature, by resistance, of each winding (high voltage, low voltage, tertiary, etc.) but an interpretation presented was that it could mean the average temperature of all the windings combined. It might also not be clear in a split winding transformer, with one winding on top in a hotter oil space, or with a series parallel winding that might operate hotter in one mode. For a delta connected winding, is the average winding temperature considered to be the average of the calculated values for each of the phases, or the average temperature of the hottest phase? A motion was made and approved that the question be brought to the attention of the Administrative Subcommittee for a ruling on whether a clear definition is necessary and, if so, who should draft it. There being no other new business, the Working Group meeting was adjourned at 4:30 p.m.

After this second report was given in the Subcommittee meeting there was a short discussion on the subject of a definition for average winding rise. Bob Vietch proposed what was discerned to be the definition understood in the industry for this term. This definition will now be added to the appropriate standard.

The third Work Group report was given by Larry Lowdermilk, Chairman of the Working Group on Thermal Evaluation of Oil Immersed Power and Distribution Transformers.

This group met at 8:00 a.m. on November 1, 1988. The minutes of the April 12, 1988 meeting in Washington, D.C., were read and approved. A request was made and accepted by Vince Dahinden of H. Weidmann Ltd., Switzerland to be added as a new member to the Working Group.

Under old business a draft of the proposed Standard C57.100 combining the thermal evaluation of both power and distribution transformers was discussed. This draft had been prepared and distributed at the last meeting by Dave Truax. The main topic of discussion centered around a proposed appendix to the Standard which was also presented at the last meeting by Dean Yannucci.

This proposed appendix covers guidelines on the design and construction of subassembly models that represent both shell and core form designs for large power transformers. Mr. Yannucci distributed a second draft of the proposed appendix at the meeting and commented that it had been modified from the original draft to include comments which address the testing of advanced transformer designs as requested by Lin Pierce at the last meeting.

Dave Truax commented that the proposed appendix appeared to be too specific and restrictive for use as an appendix. Lin Pierce suggested that it may be appropriate to include portions of the proposed appendix as specific requirements under Section 8 of the proposed standard.

Dean Yannucci commented that he has received additional input from Bill McNutt regarding alternative methods of impulse testing which he plans to include in a third draft of the appendix. It was also agreed that anyone having suggestions or comments on the appendix would forward these to Mr. Yannucci by January 1, 1989 for his use in preparing the third draft. It was also agreed that comments should be included as to which portions of the proposed appendix if any should be incorporated into Section 8 of the proposed Standard C57.100. In addition to incorporating comments received into a third draft of the appendix, Mr. Yannucci agreed to make suggestions as to how Section 8 of the proposed standard should be modified to include specific requirements on the design and construction of power transformer models.

Mr. Yannucci has agreed to have his comments regarding modifications of Section 8 and the third draft of the appendix ready for mailing to members and guests of the Working Group by the end of February.

There being no new business to be discussed, the meeting was adjourned at 9:00 a.m.

There being no new Subcommittee business the Subcommittee Meeting was adjourned.

Respectfully Submitted by,



David H. Douglas
Chairman
Insulation Life Subcommittee

ATTACH.
11188-G.

Subcommittee Report to the Transformers Committee
Tuesday, 1 November 1988
Long Beach, California

1. The Insulating Fluids Subcommittee met on Monday, 31 October 1988, and Tuesday, 1 November 1988. There were 21 members and 12 guests present.
2. Membership changes: Mr. Tom Lipscomb and Mr. Earl Morrison have resigned from the Subcommittee.
3. The first draft of the revision of C57.106 (Oil Guide) was presented. After discussion, a second draft was recommended. Draft 2 of C57.106 is scheduled for a Subcommittee ballot prior to the Spring, 1989, Meeting.
4. C57.104: Draft 6 of the Gas Guide was balloted by the Subcommittee prior to this meeting. The return ballots exceeded 75 percent of the membership. There were 11 negative ballots, and many approved and not voting ballots containing substantial comments. A general review of all the negative ballot subjects was conducted, and the Subcommittee agreed that another draft (No. 7) will be required and a Subcommittee ballot is scheduled prior to the Spring, 1989, Meeting.

It was reported to the Subcommittee that an unofficial report of the ASTM regarding serious problems with the accuracy of ASTM D-3612 existed. This was discovered following a round robin on reproducibility and repeatability. Although no specific values were given, it was indicated that the accuracy of the chromatographic method calls into question the validity of small concentrations of gas which appear in the specifications. The implications of this are that a much larger range for the limits of each specified gas will be required until this problem can be resolved. The Subcommittee will contact the ASTM directly on this matter for clarification, and advise them of the repercussions this development has on new Guides and Standards currently under development in the IEEE Liquid Insulation Subcommittee.

5. In connection with the previous item, the Subcommittee voted to remove from Draft 7 of the Gas Guide (C57.104) the Section 6.7 on Factory Testing. The Subcommittee will request a project authorization for a Guide on Gas Analysis During Factory Testing.

*C57.111 on Silicon Fluids approved by
IEEE Standards Board*

Respectfully submitted,



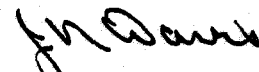
F. W. Heinrichs, Secretary
Liquid Insulation Subcommittee
IEEE Transformers Committee
FH12/22
22 December 1988

ATTACH
11/88-H.

IEEE INSTRUMENT TRANSFORMER SUBCOMMITTEE
Report for Nov. 1, 1988
Long Beach, Ca.

1. Nine members and four guests attended the meeting.
2. A C57.13 interpretation question (section 6.3.2) was studied. Unanimous agreement was reached on the answer to the question. The answer will be forwarded to the questioner.
3. The Publications Department request for editorial assistance in preparing ANSI C57.13.2-1986 was answered. The Chairman will inform Publications. (ANSI C 57.13.2-1986 "Conformance Test Procedures for Instrument Transformers")
4. Mr. Harold Moore presented his and Mr. C.C. Honey's "Recommended Insulation Levels and Dielectric Tests for Instrument Transformers". Their assistance is appreciated. - ATTACH 11/88-H1
5. The committee agreed upon format and content of Tables 2 and 3 in the C57.13 draft revision based upon the presented information.
6. Mr. John Ramboz's observations on future trends in instrument transformers, metering, relaying, and load management evoked discussion. Committee members will forward information to him on non-sinusoidal and harmonic rich transformation performance.
7. Meeting adjourned at 2:55 PM.

Respectfully submitted,



J.N. Davis, Chairman

ATTACH.
11/88-HI
PI09C

10/31/88 JTB

Recommended Insulation Levels and Dielectric Tests for Instrument Transformers

Introduction

The in service failures of instrument transformers has resulted in questions as to the insulation levels for these transformers, the protection provided, and the factory tests that should be made. The Working Group for the Revision of Dielectric Tests was asked to survey this problem and to make recommendations to the Dielectric Test Committee and the Instrument Transformer Subcommittee. C.C. Honey and H.R. Moore met in June, 1988 to review the various aspects of this problem and to draft recommendations.

The following elements were considered:

1. Many instrument transformers do not have arrester or gap protection in service. These transformers are subjected to the same voltages as larger power transformers, but the protection may not be provided.
2. Some utilities are purchasing reduced BIL instrument transformers although there may be questionable protection.
3. Maintenance procedures on instrument transformers may be minimal or nonexistent. In fact, manufacturers may not specify the same detailed maintenance procedures that are specified for power transformers. Yet these transformers are subjected to the same environmental conditions and voltage stresses as their larger cousins.
4. Instrument transformers may not be receiving the same consideration as larger apparatus due to their lower cost. However, the cost that might result from failures of an instrument transformer can be quite high.
5. Dielectric tests on instrument transformers are usually not as exhaustive as large transformers although they are subjected to the same voltages in service.

Protection

There is no reason why instrument transformers should not receive the same consideration as larger components on the system when insulation protection is being considered. While it is true that the transformer cost is much less, the cost of damage or outages resulting from a failure may be many times the cost of the instrument transformers.

Current transformers applied with circuit breakers may have the same BIL level and test values as the circuit breakers. Circuit breaker usually are purchased with higher BIL levels than power transformers. The question then arises as to the protection that may be required at these

higher BIL levels. Hileman (1) and others have investigated protection needed for the breakers. This topic is certainly beyond the scope of this survey, but we can draw a few general conclusions:

1. The degree of protection needed depends on the location of the instrument transformer with respect to protective devices. If the current transformer is located on the open side of the breaker, arresters or gaps may be required while other station protective devices may provide adequate protection on the other side of the breaker.
2. Current transformer insulation may react differently than breaker insulation so that the reaction to the various voltages and magnitudes may have to be considered separately from the breakers.
3. The cost of damage resulting from an instrument transformer failure may be large such that they should be protected the same as larger apparatus.
4. Voltage transformers and metering current transformers should receive the same protection consideration as other transformers in the station. Gaps or arresters should be provided if the transformers are not adequately protected by other devices in the station.
5. Arrester protection is necessary if reduced BIL levels are used.

Testing

In the past 25 years, there has been a trend to quality control impulse and 60 Hertz dielectric tests on power transformers even if the customer did not purchase or specify such tests. Trends on instrument transformers have tended to follow the smaller level voltage power transformers in the station. That is, the instrument transformers were only subjected to minimal dielectric tests. However, these instrument transformers are located adjacent to expensive apparatus which can receive damage from an instrument transformer failure. System outages result from these failures can be costly.

Other lines of apparatus are utilizing improved dielectric testing diagnostic methods such as partial discharge testing yet no such trends seem to be developing for instrument transformers.

It appears that the Instrument Transformer Subcommittee should include partial discharge testing as a high priority item on their agenda.

ATTACH
11/88-H 1
P 3

Lightning impulse and 60 Hertz tests with partial discharge measurements should receive serious consideration.

Proposals for production and design dielectric tests have been prepared for consideration.

A.R. Hileman, C.L. Wagner, R.B. Kisner - "Open Breaker Protection on EHV Systems", IEEE Transactions Power Apparatus and Systems, Vol. PAS-88, No. 7, pgs. 1005-1014, July 1969.

H.R. Moore
C.C. Honey

3595hh

Table I

Basic Insulation Levels and
Recommended Production Tests

Maximum System Voltage	Full Wave KV	Chopped Wave KV Time to F.O.-MS		PD Measurement Voltage - Voltage Transformers KV	Induced or Applied Potential KV RMS *
.66	10	--		.51	4
1.2	30	--		.94	10
2.75	45	--		2.1	15
5.5	60	--		4.3	19
9.52	75	--		7.4	26
15.5	110	--		12.1	34
25.8	150	--		20.1	50
36.5	200	--		28.5	70
48.3	250	--		37.6	95
72.5	350	--		56.5	140
121	550	630	3	94.3	230
145	650	750	3	113	275
169	750	865	3	132	325
242	1050	1210	3	187	460
242	900	1035	3	187	460
362	1300	1500	3	285	575
550	1800	2070	3	430	800
550	1675	1925	3	430	750
800	2050	2360	3	625	920

* Partial discharge measurements made at these voltages for current transformers.

Notes:

1. Reduced BIL designs are not recommended for 15.5, 25.8, 36.5, 48.3, 72.5, 121, 145, and 169KV voltages. BIL levels below the values shown must be negotiated with the manufacturer. Arrester protection should be provided and adequate 60 Hertz strength should be assured if reduced BIL's are used.
2. Above values are based on rod gap or arrester protection if the transformers are not protected by other devices in the station.
3. See Table II for chopped waves for breaker C.T.'s.
4. See Table III for recommended design tests.
5. It is recommended that consideration be given to holding the voltage at 1.35 max. system for 10 minutes after completion of the induced or applied tests for units 242KV and above. PD would be measured during this 10 minutes and compared to the value at this voltage prior to the induced or applied tests.

ATTACH.
11/88-H 1
P 5

Table II
Special Tests for Breaker C.T.'s

<u>BIL</u> <u>KV</u>	<u>Time to Chop</u> <u>MS</u>	<u>KV</u>	<u>Applied 60 Hz.</u> <u>Test - KV</u>
550	2	710	260
650	2	838	310
750	2	968	365
900	2	1160	425
1300	2	1680	?
1800	2	2320	860
2000	2	2640	960

Some question about the value for 1300KV BIL in the current tables.

3594hh

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PC

Table III

Dielectric Design Tests for Instrument Transformers

<u>Maximum System Voltage KV</u>	<u>BIL KV</u>	<u>Wet 60 Hz 10S Withstand KV</u>	<u>Dry Switching Surge KV</u>	<u>Wet Switching Surge KV</u>
.66	10	--		
1.2	30	6		
2.75	45	13		
5.5	60	19		
9.52	75	24		
15.5	110	34		
25.8	150	50		
36.5	200	70		
48.3	250	95		
72.5	350	140		
121	550	230		
145	650	275		
169	750	315		
242	1050	--		
242	900	--	745	700
362	1300	--	870	825
550	1800	--	1500	1360
550	1675	--	1390	1175
800	2050	--	1700	1425

1. A 60 Hz. test will be made as follows:
 - o Increase voltage to 1.35 x maximum system and measure PD.
 - o Increase voltage to applied or induced voltage test level and perform test.
 - o Decrease voltage to 1.35 x maximum system and hold for 1 hour. Measure PD during the hour.
2. Design tests shall also include all dielectric tests shown in Table I.

3594hh

MEETING MINUTES

DRY-TYPE TRANSFORMER SUBCOMMITTEE
Long Beach, CA
November 1, 1988

Chairman: R. E. Uptegraff, Jr.

1. Introductions/Attendance/Approval of Minutes

The Dry-Type Transformer Subcommittee met at 1:50 PM on 11/01/88. There were 17 members and 6 guests present (see Sec.9.). Following the introductions of those present a motion was made to approve the minutes of the 04/12/88 meeting (Washington, D. C.). Subject to the following corrections, the minutes were approved:

A. Sec.6.5

Change standard referenced from C57.12.58 to C57.12.56.

1.1 Following the introductions of those present, the status reports from the various working groups and task forces were presented by their respective chairman or their chairman's alternate. See the following sections for details:

Sec.2	Dry-Task Reactor Task Force	Mr. R. Dudley
Sec.3	Specialty Transformers	Mr. A. Iverson
Sec.4	Cast Coils	Mr. E. Koenig
Sec.5	Thermal Problems	Mr. W. Mutschler
Sec.6	Thermal Evaluation	Mr. R. Provost
Sec.7	Flammability	Mr. R. Provost
Sec.8	Dielectric Problems	Mr. D. Kline

1.2 At the conclusion of the presentation of the minutes by Mr. Dudley a discussion ensued on the scope of the various task forces and working groups in the Dry-Type Subcommittee.

The Chairman indicated that he is trying to persuade us to get away from a narrow definition of a working group and making it a little broader. He suggested that Mr. Dudley's group might better be designated the "Working Group on Dry-Type Reactors". The Chairman noted that if this were done it would be necessary to get a PAR (Project Authorization Request) which would have to contain the title of the working group and the scope of it's specific activity. He indicated that he did not see a problem with having a generalized working group title and then obtaining the necessary PAR's for each specific project for which the group was involved, "hopefully only one at a time". Mr. Allen indicated that a possible problem might arise if more than one PAR was assigned to a given working group (i.e. the same group of people) the question of competency of the members of the group to deal with the project might arise.

- 1.3 Following the presentation of the minutes by Mr. Koenig, a discussion of meeting conflicts developed. In particular it was noted that a number of conflicts existed between members of the rectifier group and the cast coil group; however, his problem exists in many other instances. A suggestion was made that the Administrative Committee might survey the members as they did a number of years ago to minimize conflicts. The Chairman suggested the working group chairmen consider Sunday meetings. Mr. Koenig will request his 'task force' chairmen to met on Sunday at the 04/89 meeting (at 2:00 PM) and the Chairman will request room availability from that meetings' host.

Also, in reference to Mr. Koenig's group reviewing C57.12.91 to C57.12.90, the Chairman suggested that it might be useful to also review the test code with the performance standards C57.12.5... .

- 1.4 After the presentation by Mr. Mutschler, the Chairman emphasized the need to obtain the data on time constants and hot spot allowances being requested in the working group. He pointed out that this data will be vital in resolving issues that will arise during the revision of the loading guide in about five years.
- 1.5 The Chairman reported that Mr. George Bowers is resigning from the Dry-Type Subcommittee but will remain active in IEEE. We shall miss him here as he has made significant contributions to our group.

The Chairman noted that Mr. Dick Provost has graciously agreed to take over for Mr. Bowers in his Dry-Type Subcommittee activities.

- 1.6 The Chairman, substituting for Mr. Kline, presented the minutes of the Working Group on Dielectric Problems.
- 1.7 The Chairman then reported on the status of the Through Fault Current Duration Guide. It had to follow the Loading Guide. Having gotten the impression that the Loading Guide has passed the Standards Board, the Through Fault Current Duration Guide should now be in process. It was noted that the Chairman has not yet seen anything to substantiate this and he will check into it further.
- 1.8 The Chairman then requested comments on the acceptability of UL 1561 as an ANSI Standard, having previously sent copies to all members of the Subcommittee for review.

The Chairman, having read the scope of the standard, noted that it was out of the description of power transformers and seemed to have more relevance to NEMA ST20. However, as Mr. Olin Compton needed a formal response, considerable discussion ensued.

It was point out by several members that the document was lacking considerable in being a "consensus" standard, having been generated primarily from UL's point of view. Also noted was the fact that the standard does not follow ANSI guidelines with respect to referencing standards by date of publication. Also, UL's method of changing their standards without review by the consensus committees was felt to be contrary to ANSI procedures. The Chairman read letters from Mr. Dutton and Mr. Gabel which expressed similar concerns.

In summary, a motion was made "to direct the Chairman to advise Mr. Compton that the Subcommittee disapproves accepting UL 1561 as an ANSI Standard because in addition to a number of discrepancies, we fail to see that it serves the consensus function that is normally attributed to ANSI process". Specific reference was made to ANSI Procedures for the Development and Coordination of American National Standards Sec.1.1, 1.2, 1.2.1, & 1.2.2. In recommending we do not accept it, we propose that they join with us or any other group appropriate to it to develop the consensus necessary to it in-line with the ANSI procedures. The motion was unanimously approved.

- 1.9 The Chairman distributed a few copies of a Symbols Chart received at the AdCom meeting the previous night. He indicated that it will be attached as a supplement to the IEEE Standards Manual.
- 1.10 The Chairman stated that Mr. Timothy Darr would be included in the roster of the Dry-Type Subcommittee and would function as our liaison to the NEMA Insulation Materials Division.
- 1.11 The Chairman inquired as to the possibility of in routine impulse tests. Work is currently being done in this area in PC57.12.90-D6 for liquid-filled distribution transformers as a quality control test.
- 1.12 The Chairman transmitted a request by Mr. Tor Orbeck to have a liaison relationship with this group; i.e. a liaison with the Dielectrics Insulating Materials Society of IEEE and in particular with respect to fire safety.
- 1.13 The final topic covered by the Chairman was PAR's (Project Authorization Requests). The Chairman noted that even if a group were reaffirming an existing standard, a PAR was required. As our records in this area appear to be sketchy, the Chairman requested the working group/task force chairmen submit copies of their PAR's to either himself or the Secretary (Mr. Patterson).
- 1.14 The Chairman announced, and encouraged attendance of, the NEMA Technical Meeting to be held the following day. There being no further business, the meeting adjourned.

REPORTS FROM WORKING GROUPS and TASK FORCES

2. Dry-Type Reactor Task Force

Chairman: Mr. Richard Dudley

Ref: C57.21 - "Requirements for Shunt Reactors"

- 2.1 The task force met 8:00 AM on 10/31/88 with 3 members and 4 guests present. Following the introductions of those present, the minutes of the 04/11/88 meeting were approved as written.
- 2.2 Discussions then took place on the 07/88 draft of C57.21 and focussed on issues arising from the inputs of the Dry-Type Reactor Task Force to the revision. The following are the key points that were discussed.
- 2.2.1 Tables 4A and 4B should be kept as separate tables. Although dry-type shunt reactors perform the same function as oil-immersed iron-core units, they are substantially different in design and construction. Therefore testing must reflect this.
- 2.2.2 It was accepted to add a note to Sec.10.4.1 to wit:
- "Note: In the case of loss evaluated dry-type shunt reactors the reference temperature to which losses are calculated should be the average winding rise, as determined by heat run, plus 20°C"
- 2.2.3 Sec.9.1.3 was originally titled "Low Frequency Tests". In an attempt to maintain a consistency of terminology, ex. in the turn-to-turn test you are applying a decaying, sinusoidal voltage in the frequency range of 100 khz which is not low frequency, the standard should be modified as follows:
- Sec.9.1.3 - Overvoltage Tests
- Sec.9.1.3.1 - Low Frequency Overvoltage Test for Oil-Immersed Shunt Reactors
- Sec.9.1.3.2 - Overvoltage Tests for Dry-Type Shunt Reactors
- Sec.9.1.3.2.1 - Applied Voltage Test
- The applied voltage test is a hipot test on the support insulation only.
- Sec.9.1.3.2.2 - Turn-to-Turn Overvoltage Test
- The turn-to-turn overvoltage test for dry-type shunt reactors shall be made by applying between the terminals a train of high frequency, exponentially decaying, sinusoidal voltages with a first peak voltage as specified in Table 6, columns 3 or 4.

2.2.4 The heading of Sec.10.3.3.2 should be modified to:

"Turn-to-Turn Overvoltage Test for Dry-Type Shunt Reactors"

Note that this is an example of being consistent and/or using commonly accepted terminology. In this case the word "overvoltage" better describes the test than the word "potential".

2.2.5 In Table 4B the Applied Voltage Test should be classified as "Other". In the case of dry-type reactors, this is a test on the support insulators which is regularly performed by the insulator manufacturer.

The wording of this section should also be changed to:

"Applied Voltage Test.....The applied voltage test...."

in order to maintain consistency of terminology.

2.2.6 Fig.3 should still show a capacitive voltage divider but should be labeled "Typical Voltage Divider".

2.2.7 In Sec.10.5.9.1 the descriptive "alcohol" should be eliminated and only the word thermometer be used.

2.2.8 Add a descriptive statement to the turn-to-turn test in Table 4B. To wit:

"This test is performed for normal supply voltage of 34.5 kV and below."

2.2.9 The titles for Tables 5 and 6 should be consistent:

"Insulation Test Levels for Oil-Immersed Shunt Reactors"

"Insulation Test Levels for Dry-Type Shunt Reactors".

The question was raised if Tables 5 and 6 should be relabeled Tables 5A and 5B to be consistent with Tables 4A and 4B. There was also a recommendation that they be located on adjacent pages. They are currently separated by about six pages of text.

2.2.10 There was a recommendation to modify Sec.10.3.5 as follows:

"10.3.5 Lightning Impulse Test Procedures.

Lightning impulse....nominal system voltage 34.5 kV and higher.....

Shunt reactors rated 34.5 kV and lower shall be tested with the turn-to-turn overvoltage test."

2.2.11 The following editorial changes were discussed.

2.2.11.1 In Sec.10.3.4.4. the references are not included in the reference list.

2.2.11.2 It was suggested that the last sentence in the second paragraph of Sec.12.4 be eliminated. The paragraph now states:

"By using cable....."

2.3 The revision of C57.16 was discussed. The following are the key points.

2.3.1 C57.16 should be revised before the loading guide.

2.3.2 The scope of C57.16 should be broadened to cover all reactors that limit or control current; ex. distribution and high voltage current limiting reactors, bus tie reactors, load balancing reactors, neutral grounding reactors, capacitor reactors, etc.

2.3.3 Filter reactors, VAR reactors, and smoothing reactors should be excluded as they are too specialized and differ widely from reactors whose basic function is to limit current. Inclusion of these reactor types would result in a weak and/or confusing standard. These reactors should be covered in their own standard.

2.3.4 A policy decision of the Performance Characteristics Subcommittee is needed on the scope of C57.16.

Between the conclusion of the Task Force meeting and the Dry-Type Subcommittee meeting, Mr. Uptegraff and Mr. Dudley have discussed this with Mr. McGill and Mr. Borst and they are at the point of getting a PAR raised. There is to be a main working group chaired by Mr. McGill responsible for putting together both the oil and dry requirements into a common document. The dry-type reactor task force shall address the dry-type portion. As to whether there will be a dielectric task force as there was for the shunt standard, it is too early to tell.

2.4 When work starts on the revision of the loading guide the consensus seemed to be that it would at best be a tutorial due to the wide variety of construction and insulation types available today in dry-type reactors.

2.5 The meeting was adjourned at 10:00 AM.

One guest requested membership. Later another individual requested membership. A problem is arising due to the timing of the meeting. It was noted that at least four individuals have expressed interest in membership in the task force but cannot due to conflicts with other meetings at the 8:00 AM time slot. If the meeting were made at 10:00 AM at least these four individuals would be able to attend. Mr. Dudley stated that he will work with Mr. Uptegraff of this problem.

There was also a request to change the title of this group to "Dry-Type Reactor Task Force" from "Task Force for Revision of the Loading Guide". See Sec.1.2.

3. Insulation Requirements for Specialty Transformers - P259

Chairman: Mr. Al Iverson

- 3.1 The working group met at 8:00 AM on 10/31/88 with 6 members and 2 guests present. Following the introductions of those present, the minutes of the 04/11/88 meeting were approved as written.
- 3.2 The Power Conversion Products Council International (PCPCI) held a round table discussion on 05/12/88 in St. Louis reviewing IEEE 259, IEEE 266, and UL 1446. The round table was well received and PCPCI indicated it's support of this working groups efforts. The group formally commented on Draft #3 of P259. Comments related to coordination with relevant IEC and CSA standards and IEEE 266. An additional temperature class was proposed and a change in the cold shock temperature was suggested - neither of which were adopted by the working group.
- 3.3 Draft #3 of P259 was further reviewed. Discussion centered on temperature classes and test procedures. Several editorial changes were made to Draft #3.
- 3.4 The working group chairman requested final comments for Draft #3 no later than 12/03/88.
- 3.5 It now appears that a "final" Draft #4 can be prepared and balloted in the working group before the Chicago, 04/49, meeting.
- 3.6 The meeting was adjourned at 10:00 AM.

4. General Requirements for Dry-Type Transformers Including Those
With Solid Cast and/or Resin Encapsulated Windings - C57.12.01

Chairman: Mr. Egon Koenig

- 4.1 The working group met at 10:10 AM on 10/31/88 with 17 members and 7 guests present. Mr. T. Singh of the Port Authority of New York and New Jersey requested to become a member and was accepted. Following the introductions of those present, the minutes of the 04/11/88 meeting were approved as written.
- 4.2 The chairman reviewed the status of the latest ballot presented to the Main Transformer Committee on C57.12.01.

Ballots Sent Out: 109
Ballots Returned: 101 --- 93% returned
 Affirmative: 87
 Negative: 0 --- 86% voted
 Not Voting: 14

An editorial correction was pointed out by Mr. Iverson. The word "Rises" in the heading of Table 4A should be singular "Rise". The chairman will have the Draft so corrected.

There were no comments received from the coordination contacts. Because of this, Draft #6A was sent to the Review Committee for their review and approval.

- 4.3 The chairman proceeded to create six 'task forces' within this working group to review C57.12.91, by paragraph, with the following two purposes in mind.
 - A. To incorporate cast coil transformers into the test code.
 - B. To simultaneously update the test code for all dry-type transformers, comparing it to the recent issue of C57.12.90-1987 - the liquid-filled test code.

The chairman agreed to sent all members a copy of C57.12.90-1987.

Member assignments and responsibilities were established as follows in the following sections.

4.3.1 Section Covered: Sec.11 - Temperature

Chairman: L. Pearce	Members: R. Bancroft
	H. Windisch
	D. Barnard

4.3.2 Section Covered: Sec.12 - Short Circuit

Chairman: W. Mutschler	Members: T. Singh
	J. Nay

4.3.3 Section Covered: Sec.10 - Dielectric Tests

Chairman: J. Rodden

Members: T. Massouda
J. Thenappen
J. Antweiler (Guest)
R. Gearhard

4.3.4 Section Covered: Sec.5, 6, 7, 8, & 9

Chairmen: R. Hollister

Members: B. Allen
W. Patterson
R. Marek

4.3.5 Section Covered: Sec.13, 14, & 15

Chairman: A. Iverson

Members: L. Pearce (Guest)
W. Simpson

4.3.6 Section Covered: Sec. 1, 2, 3, & 4

Chairman: R. Uptegraff

Members: E. Koenig

4.4 A request will be made for two meeting rooms at the 10:00 AM time period for meetings of the 'task forces' - 3 in each room - at the Chicago, 04/89, meeting. In addition, a request will accompany the above request asking for a 1:00 PM meeting room for the complete working group.

If two time periods are not possible, the secondary proposal would be for two meeting rooms at the 10:00 AM time period. A portion of the period would have to be used for a complete working group meeting.

4.5 Each 'task force' should be prepared to report to the working group a summary of its' activity at the 04/89 meetings.

4.6 The meeting was adjourned at 11:30 AM.

Following the presentation of these minutes, a discussion of meeting conflicts developed. See Sec.1.3.

5. Task Force on Dry-Type Thermal Problems

Chairman: Mr. Bill Mutschler

- 5.1 The task force met at 3:05 PM on 10/31/88 with 18 members and 8 guests present.
- 5.2 The chairman reported that the Loading Guide C57.96 Draft 10.4 dated 05/88 has been approved by IEEE RevCom as well as all liaison members. Copies will be distributed to all members of the task force. The Guide is being balloted by ANSI C57 and publication is anticipated during 1989.
- 5.3 The tabulation of average winding temperature ratings, ambient temperature ratings, and hot spot allowances prepared by Mr. Gearhard was distributed.

It was clear from this data that U.S. standards use a fixed number for hot spot allowance while IEC use a variable number depending on the average temperature rating.

- 5.4 The matrix on time constant and hot spot allowances sent out by the chairman was discussed. The consensus was that data to be collected would not be helpful unless concerned parameters were more clearly defined. The following definitions were agreed upon:

A. Time Constant

The time required to accomplish 63% of the ultimate temperature change.

B. Duct Temperature (Top and Bottom)

The temperature measured at a point in a duct even with the top or bottom of the coil.

C. Start Point

The point at which constant load is applied with windings at ambient temperature.

A list of parameters to be collected by manufacturers during temperature tests was developed for reporting to Mr. Egon Koenig prior to the next meeting. The chairman agreed to send out data collection forms to be used. Data is to be sent to Mr. Koenig by 02/28/89 and the tabulated results will be sent to the task force by 03/10/89 for study prior to the 04/89 meeting in Chicago.

- 5.5 The hot spot allowance matrix was discussed and it was agreed that the format sent out was satisfactory and manufacturers were encouraged to submit data as requested.

6. Standard Test Procedures for Thermal Evaluation of Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers - C57.12.60

Chairman: Mr. Dick Provost

- 6.1 The working group met at 11:15 AM on 11/01/88 with 11 members and 7 guests present. Following the introductions of those present, the minutes of the 04/12/88 meeting were approved with the following modification:

A. Sec.6.5

Change standard referenced from C57.12.58 to C57.12.56.

- 6.2 The Chairman reported on the status of the subject document. Written withdrawal of the two negative votes from the Transformer Committee have been received. A letter was circulated to those who reviewed the ballot noting that the title of the document would be modified to include the term "Trial Use". There was no objection to this change and the title of Draft #8 now reads:

"Trial Use Standard Test Procedure for Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers"

Editorial changes have also been incorporated into Draft #8.

- 6.3 The Chairman noted that Draft #8 will now be sent to the Liaison Coordinating Committee for review, after which the document will be sent to the Standards Board. It was noted that the IEEE Standards Manual requires that "Trial Use Standards" be effective for not more than two years from the date of publication.
- 6.4 There being no further questions or comments, this portion of the W.G. discussion was closed, and the members and guests present continued discussions related to the "Task Force on Flammability".

7. Task Force on Flammability

Chairman: Mr. Dick Provost

- 7.1 This Task Force is an extension of the Working Group on Standard Test Procedures for Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers which met at 11:15 AM on 11/01/88 with 11 members and 7 guests present.
- 7.2 The Chairman provided a report on the IEC/ACOS Workshop on "Fire Hazard Assessment of Electrical Equipment" held in Northbrook, IL on 04/11/88 to 04/12/88. A copy of the workshop proceedings was made available for review.
- 7.3 A statement from the NEMA Board of Governors concerning "Voting Guidelines on Codes and Other Technical Matters Involving Combustion Toxicity" was also read.
- 7.4 A suggestion was made to change the title and broaden the scope of the working group to combine the thermal evaluation and flammability task forces.

After further discussion, a motion was made and unanimously approved to change the title of the working group to:

"Working Group on Thermal Evaluation of Insulation Systems of Dry-Type Transformers Above 600 Volts"

The reference to 600 volts was to distinguish this group from the Specialty Transformer group chaired by Mr. Al Iverson.

- 7.5 It was further agreed that the Chairman will prepare a statement on the change in scope to more broadly reflect the monitoring of flammability issues. This will be presented at the next meeting for review and approval. This would then have to be forwarded to the Administrative Subcommittee to request a change.
- 7.6 Two articles on flammability were offered for inclusion in the literature file.
- 7.7 The meeting was adjourned at 12:20 PM.

Following the meeting, two guests requested membership in the task force:

Linden Pierce
Vince Dahinden

G.E. Co.
H. Waidmann Ltd.

Rome, GA
Rapperswil, Switz.

8. Working Group on Dielectric Problems - C57.12.58 & C57.124

Chairman: Mr. Don Kline

The minutes of this working group were presented in Mr. Kline's absence by the Chairman of the Dry-Type Subcommittee, Mr. Uptegraff.

- 8.1 The working group met at 8:00 Am on 11/01/88 with 16 members and 12 guests present. The the introductions of the present, the minutes of the 04/12/88 meeting were approved as written.
- 8.2 The Chairman reported on the status on the Transient Analysis Guide. The coordination with the IAS was reported as complete with a letter from Mr. Lentz. Mr. Uptegraff indicated that it is bogged down somewhere and that he will contact Mr. Huber of IEEE to free it loose as it appears to be lost somewhere in the "maze of New York City".
- 8.3 Mr. Max Cambre reviewed his comments on the Draft #4 of the Partial Discharge Guide concerning the sensitivity of the detection circuit.
- 8.4 The Chairman reviewed the comments and suggestions submitted by Mr. Vaillancourt.
- 8.5 A general discussion on partial discharge test equipment followed and centered on the sensitivity needs for the detection of partial discharges in the cast coils and how they are different than in the liquid-filled units.

A motion was made, and approved, that Draft #5 be rewritten and mailed for voting to the Dry-Type Subcommittee with the following changes.

- 8.5.1 The detector shall be depicted as a box labeled Zm.
- 8.5.2 The detection circuit, Zm, shall be described as a RLC circuit.
- 8.5.3 The design parameters of the RLC circuit be expanded to include those of the 'L'.
- 8.5.4 The narrow band circuit be described as a quality control alternative.
- 8.5.5 Draft #5 will be coordinated with the liquid-filled draft.

9. Attendance Roster

MEMBERS PRESENT

Allen, Ben F.
Bancroft, Roy
Barnard, David A.
Dudley, Richard F.
Hupp, Joe W.
Iverson, A. M.
Kennedy, Sheldon P.
Koenig, Egon
Manning, Mel L.
Marek, Rick P.
Mutschler, William H.
Nay, John J.
Payne, Paulette
Provost, Richard L.
Rodden, Jack
Thenappan, Vis
Windisch, Henry J.

GUESTS PRESENT

Hayes, Roger

Kalkstein, Edward W.

Lackey, John G.

Pregent, Guy

Simpson Jr., R. W.

Singh, T.

MEMBERS ABSENT

Bimbiris, Alfons
Bowers, George H.
+ Darr, Timothy
Dutton, John C.
Frank, Jerry M.
Gabel, Herman E.
++ Gaibrois, G. L.
Gearhart, R. E.
Jonnatti, Anthony J.
Kline, Don A.
Smith, Bynam E.
Weincek, S. A.

+ Liaison - NEMA Insulating Materials
Division
++ Liaison - Surge Protective Devices
Committee

ADDRESS

56 Bramsteele Road
Brampton
Ontario, Canada L6W 3M7

Engr Dept. - L5368
Wilmington, DE 19898

700 University Ave. - H12
Toronto
Ontario, Canada M5G 1X6

P.O. Box 1009
St. Jean Sur Richelieu
Quebec, Canada U3B 7A4

P.O. Box 309
Tilton, NH 03276

1 World Trade Center
New York, NY 10048

Submitted by: Wesley F. Patterson, Jr.
Secretary
Dry-Type Transformer Subcommittee
January 25, 1989

MEETING MINUTES

DIELECTRIC TESTS SUBCOMMITTEE

November 1, 1988

Ramada Renaissance Hotel - Long Beach, CA

1. INTRODUCTION/ATTENDANCE

The Dielectric Tests Subcommittee met at 10:03 A.M. with 33 members and 43 guests in attendance. John Holland and Devki Sharma have been accepted as new members of the Dielectric Tests Subcommittee.

2. APPROVAL OF MINUTES

The minutes of the April 12, 1988 meeting in Washington, D.C. were approved as submitted.

3. CHAIRMAN'S COMMENTS from ADMINISTRATIVE SUBCOMMITTEE

- A. Correspondence dated October 17, 1988 invited Transformers Committee participation in the revision of IEEE Standard #4.

"IEEE Standard Techniques For High Voltage Testing", is being revised by the High Voltage Testing Techniques subcommittee. It is the basic document which defines 60 Hz and impulse test requirements and has remained unchanged since 1978.

Mr. Clayton C. King; AB Chance Co.; Centralia, MO 65240-1395; (314)-682-8554; FAX (314)-682-8475 announced the first meeting to be held at the EPRI High Voltage Transmission Research Facility near Pittsfield, MA on November 11 and 12, 1988. Russ Minkwitz offered to attend the meeting.

- B. Unsolicited commercial displays or hospitality rooms will not be sanctioned at Transformers Committee meetings.
- C. Anyone responsible for balloting the main committee should request mailing labels from the committee secretary. Remember to get the ballots out early to provide enough review time.

4. WORKING GROUP REPORTS

A. Working Group on Revision of Dielectric Tests

H. R. Moore

The Working Group met on October 31, 1988 with 16 members and 6 guests present.

The minutes of the April 11, 1988 meeting in Washington were approved as written.

Task Force on Revision of Dielectric Tests
of Shunt Reactors
W. N. Kennedy

The Task Force met on October 31 at 1:00 P.M.

Draft 7 of "Requirements, Technology, and Test Codes for Shunt Reactors over 500 KVA" was balloted in the Working Group and Dielectric Tests Subcommittee. There were four negative ballots and a number of "Approved with Comments".

Some of the negative ballots involved front of wave impulse testing. Front of wave tests are seldom made on either reactors connected to the tertiaries of transformers or those directly connected to transmission lines. However, there were objections when front of wave tests were eliminated from a previous draft of the shunt reactor test code. It was decided that the front of wave information from the transformer test guide will be used in the shunt reactor code. A paragraph will be added to clarify the fact that front of wave tests are special and must be specified by the users.

The possibility of developing a consistent test code for air and liquid insulated reactors was discussed. One of the main points of disagreement was on partial discharge tests which are not made on air insulated reactors. Although there are some strong opinions that the tests should be the same, it appears that the best approach at this time is to have two separate test codes.

After discussion of other details, it was decided that Draft 8 will be prepared and again balloted in the Working Group and Dielectric Tests Subcommittee. Some explanatory information will be sent along with the ballot on some of the more controversial issues such as front of wave tests.

Task Force on External Phase to Phase Clearances
for Power Transformers
R. A. Veitch

Draft 8 of the proposed addition to ANSI/IEEE Standard C57.12.00 Section 6 "Minimum External Clearances Between Transformer Live Parts of Different Phases of the Same Voltage" was balloted in the Transformers Committee. The results were as follows:

Ballots sent out	116
Ballots - Approved	85
Ballots - Approved with comments	9
Ballots - Not approved	1
Not voting	3
Ballots not returned	18

85% of the ballots were returned.

The negative ballot was resolved. All of the "Approved with comments" were of an editorial nature and changes were made in the draft in line with these comments.

After resolving the negative ballot, there was 83% approval of the ballots sent out.

The Working Group recommends that the corrected draft be accepted and the process initiated to add it to ANSI/IEEE Standard C57.12.00 Section 6.

Task Force on Revision of Impulse Test Guide
R. E. Minkwitz

The Task Force met at 10:05 A.M. on October 31, 1988 with 11 members and 8 guests present. The following items were discussed:

1) Digital recording equipment for impulse tests was on the agenda for study. However, the chairman found that ANSI/IEEE Standard 1122-1987, "IEEE Standard for Digital Recorders for Measurements in High Voltage Impulse Tests", already existed. It had been sponsored by the Power Systems Instrumentation and Measurement Committee of IEEE PES. It appears that there was no liaison with the Transformers Committee. Since this is an important element in the work of this Task Force, this document should be studied to determine if it is suitable for transformer impulse tests.

2) The chairman formed a committee to review the Switching Surge Test outline prepared by Gary Hall and to prepare a draft. The following persons are on the committee:

- B. K. Patel - Chairman
- P. Krause
- H. Moore
- T. Freyhult
- D. Orten (will obtain a representative from North American Transformer).

The plan is to issue the draft to the Task Force members one month prior to the April 1989 meeting.

3) "Standard ANSI Impulse Tests" were discussed, it was agreed that the ANSI terminology is clear and that the standard tests consist of RW, CW, and FW tests only. Front of wave tests are special and must be specified by the customer when required.

4) The allowance of impulse testing transformer terminals tied together where the windings have low surge impedance was deleted from the last revisions of ANSI C57.12.90 and C57.98. H. Moore

was asked to research the past files to determine if any information exists on the matter. The Task Force should include this item in the next revision of the impulse test guide.

Under the category of Old Business, a survey of instrument transformer protection, BIL levels and testing practices prepared by C. C. Honey and H. R. Moore was presented to the Working Group. This work had been requested by the Dielectric Tests Subcommittee and the Instrument Transformer Subcommittee. After surveying the various aspects of the subject, recommendations for instrument transformer dielectric tests were prepared. Instrument transformers have in general received only a portion of the dielectric tests performed on power transformers although serious failures can result in much expense and loss of the system for periods of time. It was recommended that instrument transformers receive impulse tests and 60 Hertz tests with partial discharge measurements. Design tests were also recommended.

Under the category of New Business, the Working Group discussed the desirability of reducing the time for the enhancement voltage during the transformer induced voltage test from 7200 cycles to 5 seconds. The purpose of the enhancement voltage is to stress the insulation at a high level for a short time prior to the one hour test at 1.5 times maximum system operating voltage. It is a representation of overvoltage conditions such as switching surges which are applied with 60 Hertz voltage on the windings. When the current test guide was written, the time was extended to 7200 cycles. Persons at the Working Group meeting expressed the opinion that the 7200 cycle time serves no useful purpose and that it might result in deterioration of a good transformer insulation system. It was recommended that the Working Group establish a project to determine if the enhancement time should be reduced to a more reasonable value such as 5 seconds.

The meeting was adjourned at 4:10 P.M.

B. Working Group for Revision of Dielectric Testing of Distribution Transformers - C. V. Brown

The Working Group on Revision of Dielectric Tests of Distribution transformers met at 1:05 P.M. on October 31, 1988 with 16 members and 13 guests present.

Following self-introduction of the attendees, the minutes of the April 12, 1988 meeting in Washington, D.C. were approved as written.

Bill Henning handed out Draft 6 of the proposed addition to C57.12.90-1985 Section 10.4, Routine Impulse Test for Distribution Transformers. Last week Bill mailed this draft to all members of the Working Group and all members of the Dielectric Tests Subcommittee. The concurrent ballot on Draft 6 is due back by December 15, 1988. Bill explained the method used to detect a failure.

Task Force on Low Side Surge Requirements for
Distribution Transformers

R. E. Lee

The Task Force met at 8:00 A.M. on October 31, 1988 with 17 members and 10 guests present and at 2:10 P.M. on November 1, 1988 with 16 members and 4 guests present in Long Beach, CA.

We welcome Philip J. Hopkinson, Georg K. Kraus, Larry Lowdermilk, Mahash P. Sampat and Bruce Uhl as new members.

The minutes of the April 11, 1988 meeting in Washington, D.C. were approved as submitted.

The chairman commented that, with the October 31, 1988 Panel Discussion, most of the available information will have been presented and discussed during the course of the several Round Table and the April 11, 1988 meetings. He suggested that we must then consider three questions:

- 1) What is our course of action?
- 2) Who will do what?
- 3) Do we need a test?

The remainder of the October 31, 1988 meeting was devoted to the Panel Discussion - *GROUNDING & SURGES*

"Impact of Ground Resistance on Surge Current Distribution",
Dave Smith, PTI

"Testing to Determine the Magnetic Inrush Characteristics of
Distribution Transformers",
Art Westrom, Kearney

"Experimental Determination of the Effects of Steep Front
Short Duration Surges on 25 KVA Pole Mounted Distribution
Transformers", Chuck Eichler, Westinghouse - AST

The meeting adjourned at 10:13 A.M.

On November 1, 1988, we re-convened at 2:10 P.M.

Bob Beckwith described lightning stroke and plasma phenomena.

General discussion of the subject and the desired outcome of our effort followed. Subjects discussed included: a testing standard for transformers; an application guide; cores; interlacing; secondary arresters; consideration of the home circuitry, its protection; and, protection at the transformer and home.

Mahash Sampat commented that a utility can afford to pay \$10.00 additional purchase price for each 0.1% improvement in failure rate.

Charles Brown summarized the discussions with the recommendation that we should pursue two activities concurrently. They are:

- 1) Develop a document which will contain the information that we have gathered.
- 2) Survey the industry to determine the extent of the problem and if it is localized.

The Working Group meeting was adjourned at 1:30 P.M.

C. Working Group on Partial Discharge Tests for Transformers
G. H. Vaillancourt

The Working Group met in Long Beach, CA on November 1, 1988 at 8:00 A.M. with 19 members and 15 guests present.

The first item of the agenda was membership, two new members asked to join the Working Group. Total membership is now 35.

The Task Force reports were presented next.

Task Force for Measurement of Apparent Charge
W. J. Carter

The Task Force met in Long Beach, CA on October 31, 1988 at 8:00 A.M. with 12 members and 17 guests present. Mr. Carter was unable to attend the meeting and Mr. George Vaillancourt acted as substitute chairman.

The first item on the agenda was membership. Two new members, Mr. Ramon Garcia and Mr. Louis Nicholas were welcomed in the Task Force that now has a total of 14 members.

Next the minutes of the Washington meeting that had been distributed were read and approved as written.

Following this, revision 3.0 of the test sheet that had been previously sent out to every member of the Task Force and the Working Group on Partial Discharge Tests for Transformers was discussed and members requested that further changes be made to it before it is sent out to members of the Transformers Committee for the purpose of data collection.

A discussion on future revision of C57.113 "Trial Use Guide for Partial Discharge Measurement in Liquid-Filled Power Transformers and Shunt Reactors" was conducted next. The substitute chairman then presented some suggested changes to Section 5. These were agreed upon by the membership and will eventually be included in a new draft. Next, Mr. Dean Yannucci of Westinghouse proposed to modify Section 9.1 (Test Procedure) as to shorten the enhancement time at the 1.7 level from 7200 cycles

down to 5 seconds which would be in line with the IEC standard. It was remarked that this should be addressed by the Working Group on Revision of Dielectric Tests.

Mr. Vaillancourt suggested that at the next meeting he will prepare a complete revision of Section 9.1 that will be submitted to the membership of the Task Force for discussion, this was agreed upon by the members.

After this, a list of some partial discharge test voltage levels and acceptance levels, both in micro-volts and pico-curries, currently in use or planned by a few companies or countries was commented briefly. That list had been distributed at the beginning of the meeting and is meant to keep the membership well informed and it will be revised periodically.

There being no new business, the meeting adjourned at 9:30 A.M.

Task Force for Acoustic Detection of Partial Discharge
E. Howells

The Task Force met at 10:15 A.M. on October 31, 1988 with 6 members and 7 guests present. The chairman reported on the results of the Working Group and Subcommittee ballot of the "Trial Use Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers" PC57.127. Of the 57 ballots sent out, 5 were canceled through members retiring or having left the organization. Of the 53 remaining ballots, 42 (or 80%) were returned. 35 were approved, 3 approved with comments, 1 not voting and 3 not approved. The 3 negative votes were Messrs. Matthews, Kennedy and Yannucci and all addressed the same topic. That was the difference in the treatment of factory and field tests in the area of safety precautions. The other comments with the approved votes were all editorial and concerned some inconsistencies in some of the terminology used.

After much discussion it was decided to recommend to the Working Group that the negative votes be resolved by modifying the 1st paragraph in the Scope (1.) as follows: - end the 2nd sentence at the word "discharge" then add a sentence reading "Although primarily intended for field use, it can also be used in the factory environment if required."

Maintain only paragraph 1 and 2 as the Scope and move the remainder to either Foreword (Para. 3) or to the Introduction of the Test Procedure (Section 4.1).

The last 3 sentences in paragraph 4 being deleted.

It was further recommended that the 2nd paragraph of Scope be slightly modified to make it clear that although the procedure was not intended to provide a precise method for determining the geometric location of a partial discharge source it could sometimes provide a rough approximation of that location.

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p 8 of 8

None of the negative vote responders were present at the meeting so the chairman was instructed to attempt to contact them to determine if these actions will be satisfactory.

A brief discussion ensued relative to the proposed "partial Discharge Source Location Guide". Ed Howells reported that no response had been received to his request for information about methods (other than the EPRI method) currently in use and he again asked for help in this regard. George McCrae had forwarded a paper describing a different approach to the problem. Consequently it became obvious that as such information becomes available the Task Force would have to make a determination regarding which to include in the body of the guide and which to place in the bibliography.

No further business was brought to the floor so the meeting was terminated at 11:30 A.M.

This concluded Task Force reports.

After presentation of Task Force reports, the chairman of the Working Group consulted the membership on the course of action that should be taken next concerning the "Trial Use Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers" - PC57.127. The chairman suggested that permission for balloting through the Main Committee conditional to the resolution of the 3 negative votes be requested at the Subcommittee level since the return had been 80%. A vote was taken on this which resulted in 16 in favor and 0 against. The chairman of the Task Force, Mr. Ed Howells, will prepare a revised draft that will be discussed with the three people who cast negative votes. If they agree to the new wording a ballot through the Main Committee will be conducted before the next meeting.

There being no new business the meeting was adjourned.

5. OLD BUSINESS
None

6. NEW BUSINESS
None

7. ADJOURNMENT

The meeting adjourned at 10:40 A.M.

Robert E. Lee
Chairman

REL/rel

Minutes of the HVDC Converter Transformer
and Smoothing Reactor Subcommittee

October 31, 1988
Long Beach, California

The meeting was called to order at 8:00 am with six members and four guests present. It was noted that our PAR for our proposed HVDC standard has been accepted as C57.129. Liaisons have been requested by the Rotating Machinery, Transmission and Distribution, and Power Systems Instrumentation Committees.

We had a lengthy discussion on work that is being performed in a CIGRE working group concerning individual ac and dc one hour tests vs a combined ac + dc test. Briefly, this study analyzes several basic insulation geometries and examines the stresses for each geometry for typical operating and test conditions over a range of resistivity ratios. It was agreed at our Subcommittee meeting that the voltage division under dc conditions is an extremely complex subject, and it is expected that this analysis will identify the geometries for which the present separate tests provide adequate margin.

The remainder of the meeting was devoted to a discussion on an outline for the test standard. The outline was accepted and work will commence on individual sections. It was agreed to change the title to "IEEE Standard General Transformers and Smoothing Reactors for DC Power Transmission". This title change will be consistent with the scope and will serve to make C57.129 distinct from the work performed on rectifier transformer standards under C57.18.

Respectfully submitted,

W. N. Kennedy
Task Force for the Revision of Dielectric
Tests Requirements for Shunt Reactors

ajm:1038R

BUSHING SUBCOMMITTEE

Report to the Transformers Committee

November 2, 1988

The Bushing Subcommittee met on Tuesday, November 1, 1988 with seven members and nine guests present. Chairman Fred Elliott reported that the Working Group on the Bushing Application Guide met on Tuesday morning with six members and seven guests present. It was reported that the P757 Loading Guide, which was reaffirmed by the Transformers Committee at the Washington, D.C. meeting, had been sent to the IEEE Standards Board and the Review Committee was to have considered it on October 18. The outcome of this is not known at this time, but a notice is expected soon.

The Working Group's main task was to review the numerous comments generated by the Working Group ballots of the second draft of P800, Bushing Application Guide. Many of the comments dealt with the section on maintenance of bushings. Not all of the comments were discussed due to lack of time. If the Chairman is able to resolve the remaining comments by the next meeting, Draft 3 will be balloted by the Working Group.

Acting Chairman Wagenaar reported on the initial meeting of the Working Group on Bushings for DC Application which met on Monday morning. Seven people indicated an interest in becoming members of this new working group. The group first discussed the problem areas for DC bushings as opposed to AC bushings. It was then decided that the scope of the working group's activities should include condenser type dc bushings for converter transformers and smoothing reactors and if possible, dc wall bushings. It was pointed out that wall bushings use the same technology as the apparatus bushings and it seems logical that all of these bushings be covered by the same standard. To this

end, the appropriate ANSI Committee will be contacted to determine if it is acceptable for us to include condenser type wall bushings in our scope. Sections on service conditions, general requirements and test requirements will also be written before the next meeting.

There has been no activity within the Task Force on Bushings for Distribution Transformers.

The Bushing Subcommittee reviewed comments which have been generated so far by the Subcommittee ballots of Draft 8 of P21, General Requirements and Test Procedures for Outdoor Apparatus Bushings, and revisions of Tables 9 and 10 of IEEE 24-1984, Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings. All ballots are due by November 14. The most controversial topic involved inclusion of a thermal stability test as a design test for bushings 550kV and above. IEC 137 specifies this test for bushings rated 300kV and above and the decision to include it in Draft 8 of P21 resulted from a comment of the Draft 7 ballot of the Main Transformer Committee. A negative vote was received on Draft 8 from a manufacturer on the basis that it is a very laborious and expensive test to make. A vote was taken in the Subcommittee, inclusion of the test was favored by one vote and the test will be included in Draft 9 unless a compromise solution can be found.

The Chairman will attempt to resolve a few other unresolved comments plus any additional comments received on ballots not yet received so that Draft 9 can be balloted in the Subcommittee before the next meeting.

The Subcommittee also briefly reviewed a report from Stan Osborn on cases where deluge systems had misoperated and caused flashovers of bushings. There have been eight such cases reported to Doble Engineering in the past 15 years. The Subcommittee has requested further information from the utility

which originally brought up this problem so that we can determine if this is an industry problem which we should address.

L.B. Wagenaar

11/03/88

ATTACH.
11/88-M

Meeting Minutes
Audible Sound and Vibration Subcommittee
Long Beach, CA Meeting
November 1, 1988

The subcommittee met at 10:00 A.M. on Nov. 1, 1988 with 13 members and 11 guests. The meeting was chaired by L.A. Swenson, Secretary.

1. The minutes of the April 12, 1988 Washington D.C. meeting were approved.
2. The subcommittee's ballot on Draft 5 of the transformer noise standard (C57.12.90-198X) resulted in 75% votes returned with three negative ballots. Two negative ballots have been resolved and the third is expected to be resolved shortly.
3. The remainder of the meeting was spent resolving subcommittee members' comments and discussing various aspects of the proposed revision. Microphone distance from energized cooling equipment and distance to reflecting surfaces of the test room received considerable comment. Application of these requirements could cause problems for manufactures of small transformers (1MVA). The present standard applies to all power transformers.
4. It was pointed out that all dimensions are in English units and should be metric. The next draft will be metric.
5. It is hoped that the proposed transformer noise standard will be ready for full committee vote by the April, 1989 Transformer Committee meeting.

The meeting adjourned at 11:30 A.M.



Lennart A. Swenson
Secretary, Audible Sound
& Vibration Subcommittee

EPRI

Electric Power
Research Institute

Memorandum

October 26, 1988

TO: Mr. J.J. Bergeron
Secretary, IEEE Transformer Committee
Louisiana Power & Light Company
P.O. Box #60340
1010 Common Street
New Orleans, LA 70160

FROM: Stan Lindgren, Project Manager *SL*

SUBJECT: EPRI LIAISON REPORT

The following is a revised report for inclusion in your minutes for the November 2, 1988 meeting.

1. EHV Converter Transformer:

- Test results confirmed 25% or greater major insulation size reduction can be attained with some further work.
- Final report is being drafted.

2. Amorphous Steel For Distribution Transformers:

- GE reports they have shipped "many thousands" of commercial amorphous core transformers.

15000 Allied → 60,000 T_W net

3. Amorphous Steel For Power Transformers:

capacity

- Improved through-put in the lamination consolidation process has been accomplished.
- A pilot facility automated cutting line has been ordered.
- No problems have been reported with 500 kVA unit installed and placed in service June 1987.

Mr. J.J. Bergeron
Louisiana Power & Light Co.
EPRI LIAISON REPORT
Page 2

4. Advanced Power Transformer:

- Reduced load loss feasibility has been demonstrated.
- Detailed analytical studies exploring individual design aspects are near completion.
- Phase II involves building a number of physical models to verify the design studies.

5. Static Electrification in Power Transformers:

- Suspected failure mechanism in over 12 core form and shell form FOA transformers worldwide.
- Four basic physical mechanisms and more than ten variable parameters have been identified.
- Work is now focused on monitoring instruments and quantification of parameters for mathematical models.
- A project has been initiated to monitor a large FOA transformer in the field.

6. Bubble Evolution in Overloaded Transformers:

- Very rapid load changes can cause bubble formulation under some conditions and reduce 60 Hz and impulse dielectric strength. Demonstrated in models with rapid/high O.L.
- GE report is published EL5384. Westinghouse report is published EL5999.
- Supplemental project has been initiated with Westinghouse to better identify moisture conditions associated with bubbles and verify GE mathematical model.

7. Power Transformer With Two-Phase Cooling:

- 75% perchlorethylene, 25% oil.
- 65 mva unit went into full service October 31, 1986.
- Unit is carrying normal load without incident including temporary 15% above nameplate.
- Unit has a direct reading winding hotspot temperature monitor

(application developed through EPRI).

- Final Report is being published.

8. Active Transformer Noise Cancellation System:

- Two-year project started March 1987.
- Noise reduction in one direction is being pursued first.
- Expect initial evaluation on a substation transformer in late 1988.

9. Feasibility For Improved LTC:

- One project focused on conventional electromechanical and ways to minimize maintenance and transformer failure. Vibration signature analysis to identify maintenance is being explored.
- One project focused on feasibility of total solid state LTC and static phase shifters. An intertie simulation with fast response phase shifter was included. Final report is being published.

SRL:sf:BERGERON

cc: Stig Nilsson
Olin Compton

*Computer
10 dB reduction*

EZ 6079

LIAISON REPORT

Dr. M.L. Manning

For IEEE/PES Transformers Committee
Long Beach CA, October 30-November 2, 1988

A. STANDARDS COORDINATING COMMITTEE SCC 4.0

This Committee has not met recently; but, the following Standards by the Committee may be useful. All are obtained from:

IEEE Service Center, 445 Hoes Lane
P.O. Box 331, Piscataway, NJ 08855-1331

- 1) IEEE No. 1 (1986) Statistical Analysis of Thermal life Test Data, Guide, Standard 101-1987 (SH 12161) \$25.50
- 2) IEEE-96 (1969) General Principles for Rating Electric Apparatus for Short-Term Intermittent or Varying Duty (SH 00414) \$8.00
- 3) ANSI/IEEE Standard General Principles for Temperature Limits in the Rating of Electric Equipment and for the Evaluation of Electric Insulation (SH 10637) \$10.50
- 4) IEEE 97 (1969) Recommended Practice for Specifying Service Conditions in Electrical Standards (SH 00422) \$8.00
- 5) IEEE 98 (1984) Standard for the Preparation of Test Procedures for the Thermal Evaluation of Solid Electrical Insulating Materials (SH 077823) \$8.00
- 6) IEEE 99 (1980) Recommended Practice for the Test Procedures for the Thermal Evaluation of Insulation Systems for Electric Equipment (SH 07823) \$8.00
- 7) ANSI/IEEE 943 (1986) Guide for Aging Mechanisms and Diagnostic Procedures in Evaluating Electrical Insulation Systems (SH 10629) \$ 9.00

B. STANDARDS COORDINATING COMMITTEE SCC 4.1

This Committee has not met since January 1988; but, is active in developing IEC Standards.

The wisdom is Mel's; any typing or other errors are mine. orc

LIAISON REPORT
CIGRE SC-12 (TRANSFORMERS)

by
W. J. McNutt, U.S. Representative to SC-12

The 1988 CIGRE General Session was held in Paris from August 29 to September 3, with Transformer discussion taking place on September 1, and the Study Committee meeting on September 2. The two preferential subjects for papers and discussion were:

1. Loss Evaluation and its Influence on Design and Selection of Materials.
 2. Environmental Considerations of Transformers and Reactors.
- In addition, a subject of current interest, namely Static Electrification, was discussed on the floor for about one hour.

Emphasis in the first preferential subject centered around new materials and design features which have improved both no load and load loss performance, whose introduction was stimulated by loss evaluation. Surprisingly, evaluations in many European countries are even higher than ours.

The principal environmental concern for power transformers is the audible noise they produce. Various means of noise reduction were discussed, including new attempts at noise cancellation (Germany). There was some discussion of electromagnetically generated noise from the windings, but the most troublesome example of electromagnetically generated noise involved a single phase core with winding entrance and exit leads on opposite sides of the core. This caused an additional turn around part of the core, with load current driving that part of the core into saturation. Such a condition should be detected in factory load tests.

Another area of interaction of the transformer with the environment was the recovery of transformer losses as heat. Several installations in Europe were described. I understood the representative from East Germany to say that almost all transformers over 125 MVA in his country now have heat recovery devices.

Examples of recent problems from static electrification in the United States, Brazil, and South Africa were described, in addition to other problems which were suspected to have static electrification as a contributor. Japan spoke of their past experiences and the corrective measures they have adopted. In addition to the investigations in the U.S. sponsored by EPRI, research on this subject is also being conducted in Austria.

CIGRE Liaison Report

The Study Committee meeting was occupied with Working Group reports and plans for the next subjects to be discussed at a Colloquium in Brazil in 1989 and at the 1990 General Session.

WG-12/09 Thermal Effects in Transformers

Five Task Forces are preparing state-of-the-art reports on the following subjects:

1. Direct Measurement of Hot Spot Temperature
2. Heat Run Test Procedures
3. Maximum Permissible Hot Spot Temperature
4. Thermal Life Expectancy
5. Utility Loading Practices (Based on Survey)

These reports will ultimately be published in Electra, the CIGRE magazine.

WG-12-14/10 HVDC Converter Transformers

This group is concerned about determining the most suitable dielectric tests for converter transformers, with the probable output being recommendations for a Test Guide or Standard. There is also some utility interest in investigating reasons for unsatisfactory service performance. This work is a parallel to work within our Committee, and Bill Kennedy will provide liaison.

WG-12/11 Fast Front Transients

This new working group is investigating the phenomenon of very fast transients which occur in gas-insulated equipment as the result of flashovers or switching. These transients are characterized by nanosecond fronts and initial 1-2 MHz oscillations, followed by medium frequency oscillations. While the transients have been measured in the gas-insulated equipment, they have not been measured at the transformer terminals.

WG-12/12 Sound Measurement

This is another new working group which will be studying new sound measurement methods (sound intensity) and the nature and effects of winding noise.

There is also interest in establishing new working groups on Static Electrification and Reliability. Any IEEE members who are interested in having association with any of these working groups should contact myself or Bill Kennedy, who will take over for me as the U.S. Representative to SC-12 at the beginning of 1989.

Discussion subjects for the 1989 Transformer Colloquium in Brazil will be Thermal Aspects of Transformers (along the lines of WG-12/09) and Problems Related to Large GSU Transformers.

A-11188-0
PH



FERRANTI-PACKARD TRANSFORMERS LTD.

P.O. BOX 548, ST. CATHARINES, ONTARIO, CANADA L2R 6W9

(416) 685-6551

Telex: 061-5335

October 28, 1988

Mr. O.R. Compton
Virginia Power
Box 26666
RICHMOND, Virginia
U.S.A. 23261

RE: Liason Report: ANSI C93 Power Line Carrier

Dear Mr. Compton:

The last meeting of this group met in Washington from May 24 to May 26, 1988.

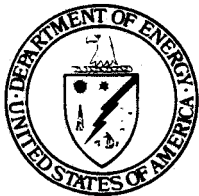
C93.5 has been changed to C93.6 and a new document for C93.5 will be issued. Both documents are currently planned to be issued by late 1989.

The next meeting is scheduled for January 10 to January 12, 1989 at El Paso, Texas.

Sincerely,

K.T. Massouda
Manager of Engineering

KTM:sd



Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208 - 3621

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P5

In reply refer to: EOH

Mr. J. J. Borgeron
Louisiana Power and Light
P.O. Box 60340, Unit L319
New Orleans, LA 70160

Dear John:

Our Mr. F. Elliott, after attending the recent Transformers Committee meeting in Long Beach, reminded me to send my Liaison report to you. Normally, my report is submitted prior to the meeting. My apology.

Due to my recent resignation from the IEEE Surge Protective Devices Committee (SPDC), the attached Liaison Report will be my last as the Transformers Committee Liaison to the Surge Protective Devices Committee. By a copy of this letter to Mr. R. Veitch, a new liaison to SPDC needs to be appointed.

Sincerely,

A handwritten signature in cursive script that reads "Edward J. Yasuda".

Edward J. Yasuda

Enclosure

cc:
R. A. Veitch, NEI-Ferranti-Packard

LIAISON REPORT
ON
PES SURGE PROTECTIVE DEVICES COMMITTEE (SPDC) AND ASC C62

by
E. J. Yasuda

Following the Washington, D.C., Transformers Committee meeting, the Surge Protective Devices Committee met in Mesa, Arizona, during April 26-29, 1988, and Boston, Massachusetts, during October 19-21, 1988. ASC C62 met concurrently with SPDC meeting in Mesa and IEC TC37 on Surge Arresters met in Gaithersburg, Maryland, during June 6-10, 1988.

The pertinent activities of interest to the Transformers Committee are briefly summarized below.

IEEE SPDC

- A new W.G. was established to develop a standard for HVDC surge arresters.
- Draft #5 on Metal-Oxide Surge Arrester Application Guide will be balloted within the W.G. and Subcommittee in early 1989.
- A controversial area was raised on the protective margin presently in C62.2 and Draft #5 of the MOSA Application Guide. Both documents call for a 15 percent margin between the equipment chopped-wave withstand (CCW) voltage and the lightning transient voltage at the equipment when separation affects are considered. When the equipment CCW is not known, the same 15 percent margin is applied between the BIL and the transient voltage at the equipment.

This subject was referred to the W.G. responsible for dielectric coordination. I expect the subject will be discussed with the appropriate W.G. in the Transformers Committee next year.

ASC C62

Much of ASC C62 in the last year was spent preparing for the IEC TC37 meeting held in Gaithersburg, Maryland, on June 6-10, 1988. Of major concern was the proposed standard on Gapless Surge Arresters differing in a few major areas with the ANSI C62.11 standard. The ANSI C62.11 duty-cycle rating is the adopted US "arrester rating" which is not recognized by IEC. IEC refers to the maximum continuous operating voltage as the "arrester rating." This issue is not resolved. Most of the draft IEC Standard have now been revised to either be consistent with ANIS C62 or closely approaching ANSI C62.11

The IEC draft standard on arresters is scheduled for a ballot under the six-month rule in late 1989.

Status of Standards Activities

See Attachment.

STATUS OF ACTIVE STANDARD PROJECTS
SURGE PROTECTIVE DEVICES COMMITTEE

DATE: 4/10/88
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ANSI I.D.	IEEE PROJECT NUMBER	NEW / REV. / REAF.	SPAR DATE	TITLE	ASSIGNED TO	*NEW INFORMATION SINCE LAST REPORT	
						COORDINATION	STATUS
C62.1	P818	REV.	--	SILICON CARBIDE SURGE ARRESTER FOR AC POWER SYSTEMS	W.G. 3.3.12 J. POSEY	T&DC, SWGR, RMC	PES TC COORDINATION IN PROGRESS
C62.2	PC62.2	REV.	3/86	GUIDE FOR APPLICATION OF GAPPED SILICON-CARBIDE SURGE ARRESTERS FOR AC SYSTEMS	W.W. 3.4.14 S. KERSHAW	TC, T&DC, SC, ICC, SWC, SCC10, IEC/TC14, IEC/TC37	IEEE APPV'D 3/87 ASC C62 REVIEWING
C62.2.01	P1041 (PC62.2A)	NEW	6/84	APPLICATION GUIDE FOR SURGE PROTECTION OF ELECTRIC GENERATION PLANTS	W.G. 3.4.13 E. STUMP	SC, TC, IEC, TC17 PGC, T&DC, RMC	IN PROGRESS (W.G.)
C62.11	PC62.11	REV.	--	STANDARD FOR METAL OXIDE SURGE ARRESTERS FOR AC POWER CIRCUITS (CONTINUOUS REV.)	W.G. 3.3.11 R. SIMPSON	DS, PSOC, T&DC, SWGR	IEEE STD. BD. APPV'D 3/10/86 WITH CONDITIONS
C62.21	P887	NEW	9/77	APPLICATION GUIDE FOR SURGE VOLTAGE PROTECTIVE EQUIPMENT ON AC ROTATING MACHINERY	W.G. 3.4.9 D. JACKSON	RMC, PSRC, PGC	IN PROGRESS. SURVEY ISSUED.
C62.22	PC62.22	NEW	3/86	GUIDE FOR THE APPLICATION OF METAL OXIDE SURGE ARRESTERS FOR AC SYSTEMS	W.G. 3.4.14 S. KERSHAW	TC, T&DC, SC, SCC10, PSPC/1A, IEC/TC14, IEC/TC37	IN PROGRESS (WG).
C62.31 -1984	PC62.31	REV.	3/87	STANDARD TEST SPECIFICATIONS FOR GAS-TUBE SURGE PROTECTIVE DEVICES	W.G. 3.6.1 C. HANSELL	IAS/PSPC, CBEMA/ESCC SCC10, COM.SOC, COMP.SOC, UL, ESCA, E1A	APPV'D 12/87 IEEE STD. BD. - SENT TO ANSI C62.
C62.32	---	REAF.	--	STANDARD TEST SPECIFICATIONS FOR LOW VOLTAGE AIR GAP SURGE PROTECTIVE DEVICES	W.G. 3.6.1 C. HANSELL	---	IEEE STD. BD. APPV'D 8/10/87
C62.33	--	REAF.	--	TEST SPECIFICATION FOR VARISTOR SURGE PROTECTIVE DEVICES	W.G. 3.6.2 R. ODENBERG	---	IEEE STD. BD. APPV'D 3/10/88
C62.35	P485.4	NEW	9/86	TEST SPECIFICATIONS FOR AVALANCHE JUNCTION SEMI CONDUCTOR SURGE PROTECTIVE DEVICES	W.G. 3.6.2 R. ODENBERG	COM SOC/TRANS SYS. COMM. PSCC, SCC10	IEEE STD. BD. APPV'D 8/10/87 ANSI HOLD E1A COORD.?
C62.36	P1039	NEW	3/84	STANDARD TEST METHODS FOR SURGE PROTECTORS USED IN LOW VOLTAGE DATA, COMMUNICATIONS, AND SIGNALING CIRCUITS	W.G. 3.6.7 M. PARENTE	PSI&MC, SWC, SC, IEC TC83, I&O TC87, ANSI X3	IN PROGRESS (W.G.)
C62.37	PC62.37	NEW	3/87	STANDARD TEST SPECIFICATION FOR THYRISTOR DIODE SURGE PROTECTIVE DEVICES	W.G. 3.6.2 R. ODENBERG	T&DC, ASC C62, SCC10	SPAR APPV'D 3/87
C62.41	PC62.41	REV.	6/86	RECOMMENDED PRACTICES FOR SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS	W.G. 3.6.4 F. HARTZLOFF	TRAN.SYS.COM/COMM SOC, IAS/COLOR BOOK, IAS/1+CPS UL, NEMA, IEC, SC, SCC10	SPAR APPV'D 6/86
C62.43	P950	NEW	6/82	GUIDE FOR SURGE VOLTAGES IN DATA, INDUSTRIAL CONTROL AND COMMUNICATION CIRCUITS	W.G. 3.6.4 F. HARTZLOFF	ANSI C-19, IEC SC28A IEC SC17B, NEMA, SAHA PEG-1, PSRC, SC	IN PROGRESS (W.G.)

STATUS OF ACTIVE STANDARD PROJECTS
SURGE PROTECTIVE DEVICES COMMITTEE

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ANSI L.D.	IEEE PROJECT NUMBER	NEW / REV. / RELE.	SPAR DATE	TITLE	ASSIGNED TO	COORDINATION	STATUS
C62.47	P1083	NEW	6/85	GUIDE ON ELECTROSTATIC DISCHARGE CHARACTERIZATION AND TESTING FOR WITHSTAND	W.G. 3.6.6 P. RICHMAN	ASC C63 EIA, NEMA, COMP.SOC., COMM.SOC., ANSI TI, T&DC, IPR&C, IAS GND SC, IAS ESDC	IN PROGRESS (W.G.)
C62.62	P1038	NEW	3/84	PERFORMANCE CHARACTERISTICS FOR SURGE PROTECTIVE DEVICES CONNECTED TO LOW VOLTAGE AC POWER CIRCUITS	W.G. 3.6.6 P. SPERANZA	SWC, IEC SC17B, IAS	IN PROGRESS (W.G.)
C62.91	PC62.01	REV.	12/85	REQUIREMENTS, TERMINOLOGY AND TEST PROCEDURES FOR NEUTRAL GROUNDING DEVICES	G.G. 3.5 E. TAYLOR	TC, PSG/SVBC, PSQC/IAS, T&DC, SCC10, IEC/TCI	IN PROGRESS (S.C.)
C62.92	143	REV.	9/77	IEEE GUIDE FOR NEUTRAL GROUNDING IN ELECTRIC UTILITY SYSTEMS	SC 3.5 E. TAYLOR	FGC, PSRC, T&DC SC, TC, IAS	DEVELOPMENT IN PARTS .1, .2, .3, .4, & .5
C62.92.2	143	REV.	9/77	APPLICATION GUIDE FOR NEUTRAL GROUNDING OF SYNCHRONOUS GENERATOR SYSTEMS	W.G. 3.5.2 S. WHISPANANT	(PROPOSED RMC, POC, PSRC)	IEEE STD. BD. APPV'D * 3/10/88 WITH CONDITIONS
C62.92.3	143	REV.	9/77	APPLICATION GUIDE FOR NEUTRAL GROUNDING OF GENERATOR AUXILIARY SYSTEMS	W.G. 3.5.3 D. JACKSON	RMC, POC, PSRC	IEEE STD. BD. APPV'D * 3/10/88 WITH CONDITIONS
C62.92.4	143	REV.	9/77	APPLICATION GUIDE FOR NEUTRAL GROUNDING OF DISTRIBUTION SYSTEMS	W.G. 3.5.4 J. BURKE	PSRC, T&DC, SC, TC	IEEE STD. BD. APPV'D * 3/10/88 WITH CONDITIONS
C62.92.5	143	REV.	9/77	APPLICATION GUIDE FOR NEUTRAL GROUNDING OF TRANSMISSION & SUBTRANSMISSION SYSTEMS	W.G. 3.5.5 E. TAYLOR	PSRC, T&DC, SC, TC RMC, PSQC	IEEE STD. BD. APPV'D * 3/10/88 WITH CONDITIONS

*NEW INFORMATION SINCE LAST REPORT

A111/88.0
P80f8

IEEE/PES TRANSFORMERS COMMITTEE
REPORT ON TECHNICAL PAPER ACTIVITIES

(a) 1988 PES Summer Power Meeting (SPM)

The SPM was held in Portland, OR from July 24-29. There were two Transformer Sessions, one on July 26, where four papers were presented and the second on July 27 where three papers were presented. I chaired the Transformers I session and Jim Gillies chaired the Transformers II session.

There was also a very well attended panel session sponsored by the T & D Committee titled, "Amorphous Transformers - Where are we?" Two of our Transformers Committee members were on the panel, our Chairman Olin Compton, presenting his thoughts from the user viewpoint and Larry Loudermilk with the manufacturers viewpoint.

(b) 1989 PES Winter Power Meeting.

Ten papers were submitted for the 1989 WPM. Five have been accepted for presentation, four were rejected and one was withdrawn. Again, I would like to thank all those members who were able to review the papers and return their reviews and comments in a timely manner. As a result of having only five papers accepted, there will be only one Transformers Session at the WPM in New York.

(c) 1989 T & D Conference

The 1989 T & D Conference will be held in New Orleans April 2-7. At this time, I have received 21 Declarations of Intent, thus if all declarations of intent result in a paper, we will have 21 papers to review for this conference. The deadline for receipt of manuscripts in New York was Oct. 7. At this time I have only received eight papers and they have been sent to various members for review. For the papers sent out for review at this time, I have asked that the "yellow" RF-2 form and accompanying comments be returned to me by Nov. 14. This is not much time, however, it has been dictated by PES headquarters asking for my "Green" RF-3 forms by Nov. 14 in New York. I have talked to Nancy Heitman, Manager of Society Special Services about this date but she was not able to change it as it was set by the Technical Paper Co-ordinator of the conference. I told her we would do the best we could but it appears obvious to me that the Nov. 14 date to have all reviews into headquarters is unrealistic.

Technical Council Publications Committee

This committee met at the SPM in Portland on July 25, 1988. The following items from this meeting should be noted:

1. The Publication Guide for Mandatory Review of Visuals and Use of Overhead Transparencies is being revised and new guidelines will be presented. As you know, overhead transparencies have not been permitted at recent meetings but this policy is now being reviewed. In the future, all visuals will have to be approved by the Technical Program Co-ordinator before they can be shown at a technical session.
2. The subject of Conference Record Status Papers was discussed. It was agreed that all papers to be presented at the 1989 T & D Conference will be published as Transactions papers. The "Conference Paper" classification will not be introduced until the 1991 T & D Conference.
3. A training session was held for new Technical Paper Co-ordinators. Each new Vice-Chairman is automatically the Technical Paper Co-ordinator and is very quickly thrust into the job of sending out papers for review, checking the reviews, deciding which papers will be published and which will not and finally setting the program for the Summer and Winter Power Meetings. These training sessions should prove to be very valuable.
4. Review Procedures for IEEE Periodicals (see Item 1). The Publications Board (PUB) had noted, with concern, an IAS policy requiring presentation of a paper at an IAS conference as a prerequisite for Transactions publication. A similar PES policy was also noted. Many PUB members believed that the "conference presentation requirement", appeared to discriminate against non-U.S. authors.

As a result, a new policy was drafted which was presented and approved at the May 20 PUB meeting.

The new policy is shown on Item 1. Item B of this policy states, "The sponsoring Society will be responsible for ensuring an alternate method of presentation or review if an author cannot himself/herself make the presentation at the conference!"

5. Technical Paper Presentations at Technical Committee Meetings (see Item 2). A proposal to allow the presentation of a maximum of three technical papers per year, per committee, at Technical Committee Meetings, which are held at locations and times differing from those of the PES General or Special Meetings, was discussed. The pros and cons of such a policy are given in Item 2. This proposal was discussed but no decision was made at the meeting.



Robert A. Veitch
Vice-Chairman/Publications Co-ordinator
Transformers Committee



Item 1

ATTACH- 11-88-P
P3

IEEE

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
345 EAST 47TH STREET, NEW YORK, N.Y. 10017-2394, U.S.A. TELEX 236411

June 16, 1988

DIRECT NUMBER (212) 705-

TO: Technical Activities Board

FROM: Timothy N. Trick - Vice President, Publication Activities

SUBJECT: New Policy on Review Procedures for IEEE Periodicals -- ACTION

At its February 12 meeting, the Publications Board had noted, with concern, an Industry Applications Society policy requiring presentation of a paper at an IAS conference as a prerequisite for TRANSACTIONS publication. A similar Power Society policy was also discussed. Although both IAS and PES can arrange for alternate presentors for authors not able to attend a conference in person, many PUB members believed that the conference presentation requirement, unlike the traditional journal review process, appeared to discriminate against non-U.S. authors. It was therefore agreed that a new policy explicitly precluding such discrimination should be drafted and presented at the May 20 PUB meeting.

The proposed new Policy, shown overleaf, was approved at the May PUB meeting. Before seeking final approval from the Board of Directors, TAB's comments on the wording and content of the proposed policy are sought.

REASON:

Assure by means of an explicit policy that any review process involving conference presentation does not discriminate against non-U.S. authors.

PROPOSED ACTION:

Provide PUB with comments on the wording and content of the proposed new policy.

PROPOSED NEW POLICY

6.20 - REVIEW PROCEDURES FOR IEEE PERIODICALS

All archival material published in IEEE periodicals must undergo peer review. Conference presentation by an author may be one method of peer review, but it may not be a requirement. Such a requirement discriminates against authors who cannot afford conference travel, unduly restricts the flow of information in a transnational organization, and, thus, is a disservice to the members. If conference presentation is a part of the review process, an alternate review process, which is not dependent on the author's ability to travel, must be offered.

For those few IEEE publications which link conference presentation to later journal publication, the following policies apply:

- A. All conference/journal papers will be selected on merit and appropriateness, not on the ability of the author to present his/her paper in person.
- B. The sponsoring Society will be responsible for ensuring an alternate method of presentation or review if an author cannot himself/herself make the presentation at the conference.
- C. The above policies will be made clear in both formal and informal communications with all prospective authors.

Item 2

Technical Paper Presentations
at Technical Committee Meetings

Proposal

To allow the presentation of a maximum of three Technical papers per year, per Committee, at Technical Committee Meetings which are held at locations and times differing from those of the PES General or Special Meetings. They would be reviewed and judged as are all other papers. The author would be given the right to request which type of meeting he would prefer for his presentation. The Technical Paper Coordinator, in conjunction with the Committee Chairman, would select which approved papers are to be presented at the Committee Meeting. After this presentation only, the paper would receive full Transactions status.

Pros

1. It would provide for the author a larger audience of uniquely informed listeners.
2. It would allow a much longer, more detailed presentation (if desired by the Committee) without interfering with other Committees.
3. It would stimulate more oral and written discussion.
4. It would relieve the meeting room scheduling problem at PES meetings.
5. It would encourage the submittal as IEEE papers of some of the better, more practical papers now being presented to other specialized conferences where the author, in the past, has been seeking the larger audience instead of the archival publication.
6. The Committee would assume the responsibility of providing a projector and screen as well as a meeting room.
7. Greater attendance by local members would be promoted for Committee meetings.

Cons

1. Transferring the presentation of Technical Papers to other locations would tend to weaken the PES General and Special Meetings and may cause some members to stop attending.
2. This procedure may lengthen the Committee Meeting, some of which, with adjunct meetings, are already three or four days long.
3. It would probably cause problems with availability of preprinted papers because of the skewed timing relative to publishing of other preprints (on the other hand, this spreading of the publishing period for preprints may provide some relief to Society Special Services).