MINUTES OF THE IEEE/PES

TRANSFORMER COMMITTEE

NOVEMBER 9, 1983

DETROIT, MICHIGAN

MINUTES OF THE IEEE/PES
TRANSFORMERS COMMITTEE
NOVEMBER 9, 1983
DETROIT, MICHIGAN

Members or Representatives Present - 75

L. J. Savio, Chairman
O. R. Compton, Secretary

Allen, B. F.
Allustiarti, R.
Arjeski, E. H.
Arnold, J. C.
Bancroft, R.
Bennon, S.
Bergeron, J. J.
Bonucchi, J. V.
Borst, J. D.
Cash, D. J.
Chitwood, E.
Cook, Jr., F. W.
Corkran, J.
Crofts, D. W.
Douglas, D. H.
Ebert, J. A.
Edwards, E. C.
Evans, C. G.
Farber, W. R.
Fischer, H. G.
Foster, S. L.
Frydman, M.
Gabel, Jr., H. E.
Goldman, A. W.
Grubb, R. L.
Gunnels, G.
Harlow, J. H.
Highton, K. R.
Hoefler, P. J.
Honey, C. C.
Huber, E. J.
Huber, Jr., F.
Hurty, C.
Iliff, G. W.
Jacobsen, R. G.
Kappler, C. P. rep. by
Miller, L. D.
Keller, O.
Kelly, J. J.
Lampe, W.
Liebich, R. E.
Light, H. F.
Little, R.
Long, L. W.
Manning, M. L.
Matthews, J. W.
McCormick, L. S.
McGill, J. W.
McMillen, C. J.
McNutt, W. J.
McCraw G. G.
Mehta, S. P. rep. by
Thenappen, V.
Melton, N. J.
Millian, C.
Minkwitz, Sr., R. E.
Mitchell, C. E.
Motschler, W. H.
Olsson, R. A.
Perco, D. D. rep by
Birke, P.V.
Pearce, H. A.
Roach, D. A.
Smith, L. R.
Stensland, L. R.
Takach, D.
Tanton, A. L.
Thomas, R. C.
Thomason, F. W.
Thompson, J. A.
Traub, T. P.
Truax, D. E.
Uptegraff, Jr., R. E.
Veitch, R. A.
Wagenaar, L. B.
Wrenn, W. E.

Members Absent - 54

Aicher, L. C.
Allacchi, J.
Allan, D. J.
Alton, R. J.
Antalis, S. J.
Bell, G. M.
Bellaschi, P. L.
Bowers, G. H.
Brutt, F. J.
Buchanan, D. F.
Chartier, E. E.
Daniels, M. G.
Degeneff, R. C.
Douglass, J. D.
Duckett, D. A.
Dutton, J. C.
Easley, J. K.
Ensign, R. L.
Falkowski, P. P.
Forster, J. A.
Gardam, C. M.
Gillies, D. A.
Griffard, W. F.
Hall, G.
Hawkins, T. K.
Heinrichs, F. W.
Herrera, J. J.
Jauch, E. T.
Johnson, D. C.
Kieren, R. C.
Kline, A. D.
Lauber, T. S.
Lipscomb, T. G.
Lowe, R. I.
Margolis, H. B.
Miller, C. K.
Moore, H. R.
Musil, R. J.
Norton, E. T.
Ottevangers, J. H.
Patel, B. K.
Schmid, R. L.
Smith, B. E.
Stein, W. W.
Stetson, R. B.
Stockum, F. R.
Vargo, S. G.
Vora, J. P.
Walton, J. W.
Wiencek, S. A.
Whearty, R. J.
Wilks, A.
Wurdock, A. C.
Yannucci, D. A.

Guests - 31

Barnard, D. A.
Binder, Jr., W. B.
Boettger, W. E.
Brown, C. V.
Bryant, G.
Delbsdo, A.
DeLeon, J.
Fallon, D. J.
Germain, J. P.
Guild, A. L.
Henning, W. R.
Jakowenko, B. A.
Kalkstein, E. W.
Kaschalk, T. L.
Kennedy, W.
Koenig, E.
Lackey, J. G.
Lee, G.
Lee, R. E.
McGill, J.
Miller, L. D.
Mills, K. D.
Morrison, E.
Niebrzydowski, L. M.
Pollitt, J. M.
Rickley, A. L.
Simpson, Jr., R. W.
Shenoy, V.
Sperry, M. M.
Yung, C. S. B.
Zguris, J. M.

MINUTES OF MEETING
IEEE/PES TRANSFORMERS COMMITTEE
DETROIT, MICHIGAN NOVEMBER 9, 1983

1.0 Chairman's Remarks and Announcements

Chairman Savio convened the meeting at 8:00 a.m. with 75 members or representatives and 31 guests present. Appreciation was expressed to Donald Cash and Detroit Edison for the super hosting job well done. The total registration was 165.

George McCrae invited all present to the 1984 Spring Meeting in Vancouver, B.C.

2.0 Approval of Minutes of the Atlanta, Georgia Meeting of April 13, 1983

The minutes were approved as mailed.

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

3.1 Future Meetings

	Date	Hotel
Vancouver	April 1-4, 1984	Holiday Inn Harbourside
Boston	October 15-17, 1984	Park Plaza
St. Louis	April 14-17, 1985	Stouffer's Riverfront Towers
Toronto	October 27-30, 1985	Delta Chelsea Inn
Little Rock	Spring 1986	
Pittsburgh	Fall 1986	
Fort Lauderdale	Spring 1987	
New Orleans	Fall 1987	

4.0 Report of PES Standards Co-ordinating Committee - D. A. Yannucci

-Appendix 1B

5.0 Subcommittee Reports

			Appendix
5.1	Audible Sound and Vibration -	R. E. Liebich -	
5.2	Bushings -	L. B. Wagenaar -	1D
5.3	Dielectric Tests -	L. S. McCormick -	1E
5.4	Dry-Type Transformers -	B. F. Allen -	1F
5.5	Instrument Transformers -	R. C. Thomas -	1G
6.6	Insulation Life -	C. J. McMillen -	1H
6.7	Insulating Fluids -	H. A. Pearce -	1I
6.8	Performance Characteristics -	J. D. Borst -	1J
6.9	Recognition and Awards -	L. W. Long -	
6.10	Transformer Standards -	L. R. Smith -	1K
6.11	West Coast -	R. Little -	1L
6.12	Liaison Representatives -		1M

6.0 Technical Papers for Future Meetings - D. A. Yannucci - Appendix 1C

7.0 Membership

Present membershiop stands at 112.

Four new members were recognized. They were:
Dan W. Crofts - Texas Power and Light
Jack W. McGill - Siemens-Allis, Inc.
Chris A. Robbins - EHV Weidmann
Dan D. Perce - Westinghouse - Canada

8.0 New Business

None

Respectfully submitted,

Olin R. Compton
Secretary to the Committee

3.0 Administrative Subcommittee

The Administrative Subcommittee met at 7:00 PM on Monday, November 7, 1983. The following summarizes the activities of that meeting:

A. Technical Council Activity

The Technical Council (T.C.) met in Los Angeles, California on July 18, 1983. Mr. Yannucci attended the meeting in the absence of Leo Savio. The following highlights the items of interest to the committee:

1. T.C. requested each technical committee survey their membership as to their willingness to buy bound volumes of PA&S Transactions at a suggested cost of $150.00 per set. See attached.

2. T.C. requested that a member from each technical committee be assigned to a Tutorial Subcommittee. Half day tutorials were suggested.

3. The Chapter Council (Mr. Fiedler) requested a closer cooperation between the Chapters and Technical Committees such as notification of time and location of meetings. See attached.

4. Student participation is being encouraged by the T.C. It has been suggested that students be given projects to work on with their professors which would result in the generation of a technical paper. See attached.

5. T.C. reorganization is on hold until Publication Committee makes their recommendation.

6. T.C. needs liaison to the Public Affairs Council.

7. New Delhi, India has requested to become involved without attending meetings as a corresponding member.

B. PES Standard Coordinating Committee

The PES Coordinating Committee met on Monday July 18 at the 1983 Summer Power Meeting.

There was a suggestion that C-76 Appartus Bushings become a part of C-29 Insulators for Electric Power Lines. This was discussed and it was concluded that the work of C-76 is presently being done in the Transformer Committee and that C-76 can be terminated.

Bert Stanleigh of IEEE Standards reported the organizational changes due to ANSI Accreditation process is proceeding. An interim report was in the May issue of the PES Review. A status report will be issued shortly to IEEE ANSI Committee Chairman and Technical Committee Chairman on the latest developments on ASNI committees. It is also planned to submit this information to the PES Review for PES membership information. At the present time, it is likely that N41 and C-40 will be terminated.

Operating procedures for ANSI accredited committees will be required. Negotiations are going on at the present time with NEMA on this matter. Actually, there will be little difference in operations of ASNI accredited committees from previous procedures.

The IEEE Standards Staff will review the PES liaison representatives to other organizations including ASNI and advise which committees will remain operational. For example, ASME has decided to turn ANSI Committees into ASME Committees. ASME has requested that IEEE liaison representatives sign ASME Code of Ethics forms. IEEE Staff has advised ASME that IEEE representatives will adhere to the ASME Code of Ethics insofar as they are in agreement with the IEEE Code of Ethics. ASME advised that in effect the IEEE representatives are no longer liaison representatives to the ASME committees. This problem is still being addressed.

IEEE legal fees in definding the recent cable lawsuit were approximately $250,000.

Any standards that involve electromagnetic effects should have C-63 coordination.

The new issue of the IEEE Dictionary is scheduled for the end of 1983.

John Bauer of NPEC has sent out a questionnaire on electrical noise to all the committees. It is urged that the information be returned expeditiously.

Subject to PES approval, the officers for the PES-SCC for 1984 will be J. V. Bonnuchi, Chairman and P. G. Cummings, Vice Chairman.

Since April 1983, I have reviewed thirteen requests for coordination and have accepted two for coordination. They are:

1. Guide for Specification of HVAC System Steady State Performance - Substation Committee

2. Recommended Performance for Distribution Type Polymeric Insulators - Transmission and Distribution.

C. Review of Standards Activity

Report is attached to minutes.

D. Liaison Representation

The following liaison representative vacancies exist and volunteers to fill these are solicited from the membership. All Subcommittee Chairmen were requested to solicit participation :

- o ANSI C76
- o ANSI C84
- o ASNI C92

E. Technical Paper Reports

A total of fifteen papers were submitted for the Winter IEEE Meeting in Dallas. Of the fifteen papers, six were accepted. However, one of the papers was withdrawn by the author who elected to submit it to the 1984 T&D Conference. Three papers were rejected outright and the remainder were rejected by revision would be reconsidered.

There will be two transformer sessions on January 20, 1984; one at 9:00 AM and one at 2:00 PM.

Special thanks is to be given to all the reviewers. The reviewers did an outstanding job in returning their review sheets and 100 word summaries.

The T&D Conference will be held in Kansas City on April 29-May 4, 1984. Two papers have been received for review to date.

D. Future Meetings

April 1-4, 1984	Holiday Inn, Harborside City Center, Vancouver, B.C. Host: George McCrae
October 14-15, 1984	Park Plaza Hotel Boston, Mass. Host: R. Minkwitz
April 14-17, 1985	Stouffer's Riverfront Towers St. Louis, MO Host: Charles Mitchell
October 27-30, 1985	Delta Chelsea Inn Toronto, Canada Host: C. Vietch
Spring 1986	Little Rock, AR Host: C. Kappler
Fall 1986	Pittsburgh, PA Host: Dave Truax
Spring 1987	Florida Host: C. C. honey
Fall 1987	New Orleans, LA Host: J. Bergeron

E. Membership

The following have resigned committee membership and I wish to acknowledge their contribution and wish them luck:

- J. C. Harbell
- Colin Lindsay
- J. C. Goru[illegible]

The membership list is under review in addition to attendance records. Those members who have missed two meetings or more will be notified by letter and their future participation will be reviewed.

The Subcommittee voted to accept the following as members of the Transformer Committee:

o	Jack McGill	-	Siemens-Allis
o	C. A. Robbins	-	H. V. Weidman
o	Dan Perco	-	Canadian Westinghouse
o	Dan Crofts	-	Texas Power and Light

F. PES Awards

For the record, the recipients of the Committee's Outstanding Service Award were:

1983	-	J. Easley
	-	P. Belachi (Special)
1982	-	C. Honey
1981	-	(none)
1980	-	(none)
1979	-	L. Long
1978	-	J. Dutton

Mr. Long will report at the Committee meeting on the other awards. Mr. W. McNutt will relieve Mr. Long as this Committee's representative to the PES Awards Committee.

F. Other Business

IEEE is seeking nominations for Congressional Fellows of IEEE to serve four one year (1984-1985). See attached.

Working Group schedule conflicts were addressed at the meeting. Olin Compton and the Subcommittee Chairmen will review scheduling. Olin will use a computer to arrange the schedule to obtain minimum conflict.

ATTACHMENT III

IEEE POWER ENGINEERING SOCIETY

Please address reply to:

Publications

The PA&S Transactions and the Review have been running reasonably within budget considering that the authors have been gradually increasing the length of the one page summaries,which has increased the number of pages in the Review. The Review is now running about 700 pages per year and the 1983 budget was prepared on the basis of 600 pages.

We should hold the page budgets constant for the 1984 year at the same level we have had in the past, 4500 pages for the PA&S transactions and 700 pages for the Review. This page allotment will allow the following number of papers to be presented at the various meetings in 1984:

1984 Winter	220
1984 Summer	200
1984 JPGC	25
1984 T&D	140

The costs of 1982 Bound volumes, based on 400 copies, follow:

Binding,all other associated costs	$14,918
Solicitation	4,120
Wrapping/shipping(Set) $2.00	
Mailing Cost— destination dependent.($12 avg)	
Original production cost set,incremental $12.00	

Based on the above costs the 1982 bound volume cost to the PES is $74.00. Suggest a member price of $150.00 per set and a non-member price of $300.00 (agreement with HQ required)

The inventory of bound volumes from past years,available for sale,is:

1974 - 233 sets	1977 - 211 sets	1980 - 315 sets
1975 - 233	1978 - 300	1981 - 31
1976 - 91	1979 - 410	

The publications department has received requests to add the 1st and last page numbers to the one page summaries and also indicated the discussors of the Transactions paper by listing the names in the Review. We plan to implement these suggestions.

C. J. Essel, Editor, Transactions and Review
July 15, 1983

Power and Life

CHAPTERS COUNCIL

IEEE PES 1983 SUMMER MEETING
LOS ANGELES, CALIFORNIA
JULY 18, 1983

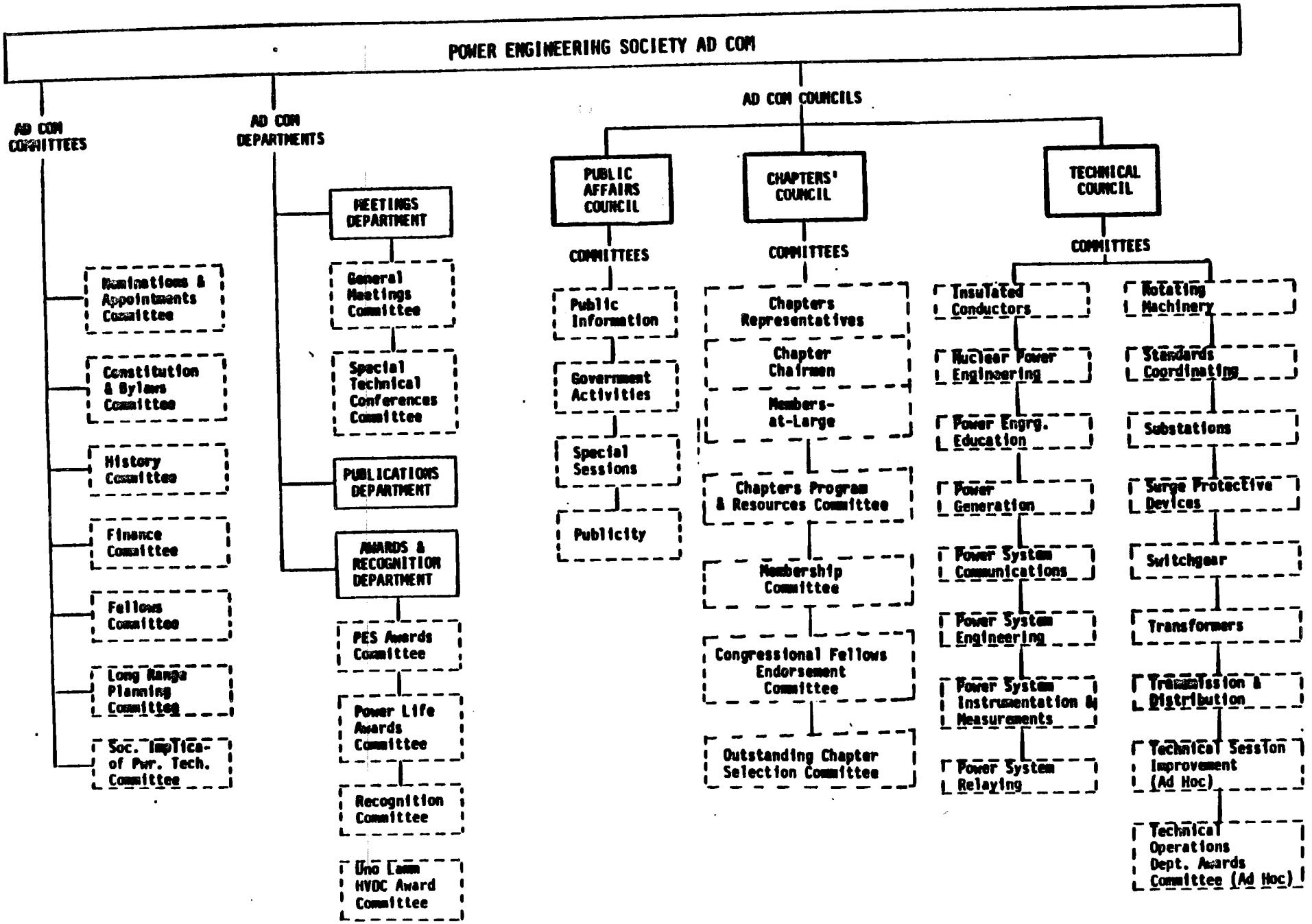
HAROLD J. FIEDLER
PAST CHAIRMAN
GENERAL ELECTRIC COMPANY
BLDG. 2, ROOM 512
1 RIVER ROAD
SCHENECTADY, NY 12345
(518) 385-4840

- OBJECTIVES
  - DEVELOP PROGRAMS/ACTIVITIES
    - LOCAL CHAPTERS
    - CHAPTERS COUNCIL
    - TECHNICAL COUNCIL
  - CHAPTER PARTICIPATION IN TECHNICAL COUNCIL ACTIVITIES
  - PROVIDE TECHNICAL COUNCIL RESOURCES/TECHNICAL INFORMATION TO LOCAL CHAPTERS
  - SERVE THE NEEDS OF CHAPTERS/MEMBERS

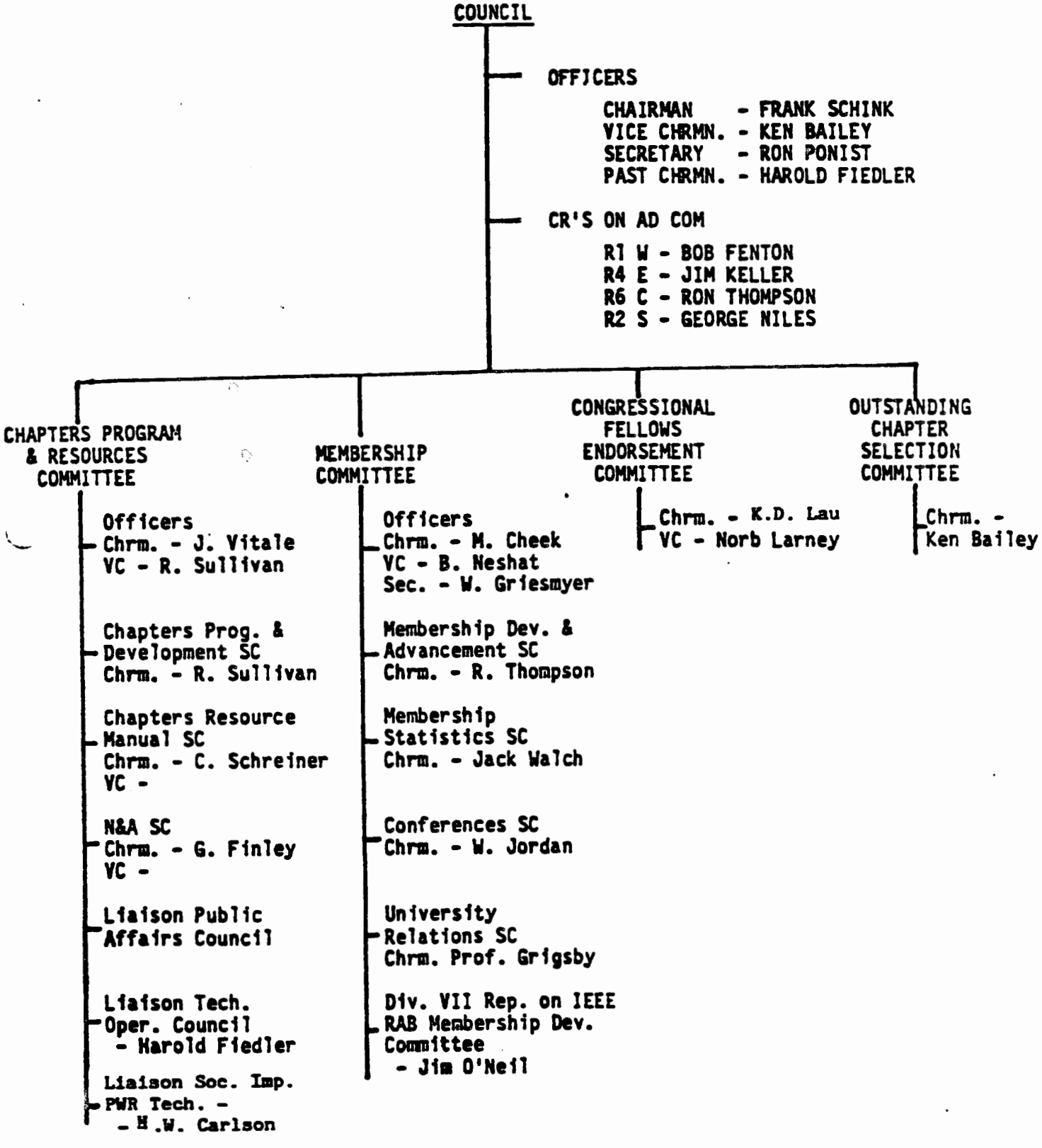
- DISCUSSION OUTLINE
  - CHAPTERS COUNCIL
    - ROLE & ORGANIZATION
    - ORGANIZATION & APPOINTMENTS
  - EXPLORE PROGRAM IDEAS -- TECHNICAL/CHAPTERS COUNCILS
    - IDENTIFY NEEDS OF CHAPTERS
    - ROLE OF TECHNICAL COUNCIL
    - COMMENTS & SUGGESTIONS
  - IMPLEMENT A TECHNICAL/CHAPTERS COUNCIL PROGRAM
    - SERVING CHAPTER NEEDS

CHAPTERS COUNCIL

- ROLE & OBJECTIVES
  - PROMOTE ORGANIZATION & EFFECTIVENESS OF SOCIETY CHAPTERS
  - REPRESENT INDIVIDUAL CHAPTER (AND MEMBER) INTERESTS
    - SOCIETY POLICIES & DECISIONS
    - TECHNICAL PROGRAM ACTIVITIES
  - PROMOTE SOCIETY MEMBERSHIP
  - ENCOURAGE MEMBERSHIP ADVANCEMENTS TO HIGHER GRADES
  - ENHANCE COMMUNICATIONS BETWEEN PES CHAPTERS AND AD COM COUNCILS. DEPARTMENTS & COMMITTEES
  - DEVELOP PROGRAMS FOR LOCAL CHAPTER USE


POWER ENGINEERING SOCIETY AD COM
AD COM COMMITTEES
Nominations & Appointments Committee
Constitution & Bylaws Committee
History Committee
Finance Committee
Fellows Committee
Long Range Planning Committee
Soc. Implica- of Pwr. Tech. Committee
AD COM DEPARTMENTS
MEETINGS DEPARTMENT
General Meetings Committee
Special Technical Conferences Committee
PUBLICATIONS DEPARTMENT
AWARDS & RECOGNITION DEPARTMENT
PES Awards Committee
Power Life Awards Committee
Recognition Committee
Uno Lamm HVDC Award Committee
AD COM COUNCILS
PUBLIC AFFAIRS COUNCIL
COMMITTEES
Public Information
Government Activities
Special Sessions
Publicity
CHAPTERS' COUNCIL
COMMITTEES
Chapters Representatives
Chapter Chairmen
Members-at-Large
Chapters Program & Resources Committee
Membership Committee
Congressional Fellows Endorsement Committee
Outstanding Chapter Selection Committee
TECHNICAL COUNCIL
COMMITTEES
Insulated Conductors
Nuclear Power Engineering
Power Engrg. Education
Power Generation
Power System Communications
Power System Engineering
Power System Instrumentation & Measurements
Power System Relaying
Rotating Machinery
Standards Coordinating
Substations
Surge Protective Devices
Switchgear
Transformers
Transmission & Distribution
Technical Session Improvement (Ad Hoc)
Technical Operations Dept. Awards Committee (Ad Hoc)

CHAPTERS COUNCIL APPOINTMENTS



TECHNICAL/CHAPTERS COUNCILS PROGRAMS

- CHAPTERS NEEDS
  - SPEAKERS BUREAU/TECHNICAL PROGRAMS
  - LIST OF TECHNICAL COMMITTEE, SC AND WG MEMBERS
    - REGION, SECTION & CHAPTER IDENTIFICATION
  - CHAPTER PARTICIPATION IN TECHNICAL COUNCIL ACTIVITIES
    - SCHEDULE OF TECH. COMMITTEE, SC & WG MEETINGS
  - TUTORIALS AND COURSES
  - CATALOGUE OF TECHNICAL COMMITTEES & WORKING GROUPS
  - PROGRAM DEVELOPMENT IDEAS
  - PRIZE PAPER AWARDS AT CHAPTER LEVEL
  - STUDENT PARTICIPATION IN TECHNICAL COUNCIL ACTIVITIES
- ROLE OF TECHNICAL COUNCIL
- ROLE OF CHAPTERS COUNCIL
  - LIAISON TO TECHNICAL COUNCIL
  - LISTING OF CHAPTERS & CHAPTER CHAIRMAN

IMPLEMENTING A TECHNICAL/CHAPTERS COUNCIL PROGRAM

- EXHIBITS (FORMS)
- PRIZE PAPER AWARD
  - RECOGNITION AT CHAPTER LEVEL
- STUDENT PARTICIPATION IN TECHNICAL COUNCIL ACTIVITIES

Exhibit No. 1

PES Speaker List

Technical Program

Technical Committee, SC or Working Group: _____

Topic or Technical Paper	Speaker	Availability	
		Date(s)	Restrictions
1.	Name: Address: Phone:		
2.			
3.			
n.			

PES CHAPTER PROGRAMS

TOPIC TITLE	Speaker	Attendance IEEE	Attendance Guest	Attendance Total	Date	PES Chapter	Comments
Transient Overvoltages on an Integrated AC/DC Transmission System	Dr. Saburo Sasaki of Central Research Inst. of Electric Power Industry (Japan)	23	30	53	11/6/81	Winnipeg	
The Manitoba Alcan Project	Brian Van Snellenberg of Alcan	20	44	64	11/27/81	Winnipeg	Details of the proposed aluminum smelter in Manitoba
Intermountain Power Project	David Fletcher of Teshmont Consultants Inc.	26	30	56	12/6/81	Winnipeg	Brief description of the 3200 MW, 500V DC scheme to transmit power from Utah to Los Angeles in 1986
Fiber Optics - How It Works And What It Can Do	Dr. C. Barron of Canada Wire & Cable				1/13/82	Winnipeg	A review of the background of the technology and applications of interest to the power industry
The Application of Electrical Technology to the Candu Reactor Safety Program	Dr. Bruce McDonald of Atomic Energy of Canada Whiteshell Nuclear Research				1/27/82	Winnipeg	
CAD/CAM-Improved Design Methods	Jacob Reichbart of Manitoba Research Council				2/11/82	Winnipeg	Nature of the tools and the manner in which they are used. New responsibilities for designers and managers.
Reliability Analysis of HVDC Transmission	V. Burtnyk of Teshmont Consultants, Inc.				3/3/82	Winnipeg	Description of techniques used to evaluate the reliability of HVDC systems and examples.
Thyristor Controlled Series Compensators	Dr. R.M. Mathur & Dr. K.A. Krishnamurthy of University of Manitoba				3/25/82	Winnipeg	Technique of controlled voltage

Exhibit 2

PES Technical Committee Member

Chapter Affiliation

Technical Committee, SC or Working Group: _____

	Name	Address & Phone	Region	Section	PES Chapter Affiliation
1.					
2.					
3.					
n.					

Exhibit 3

Schedule of Meetings of PES Technical

Committees, Subcommittees & Working Groups

Technical Committee, SC or Working Group: _____

Contact: Name _____

Address _____

Phone ( ) _____

Date	City	Hotel/Location

Exhibit No. 4

PES Tutorials and Courses

Technical Committee, SC or Working Group: _____

Contact: Name _____

Address _____

Phone ( ) _____

Tutorial, Course or Topic	Resource Material	Remarks

Exhibit No. 5

Technical Committee Working Groups

Technical Committee: _____

Working Group: _____

Contact: Name _____

Address _____

Phone ( ) _____

1. Goals, objectives, activities:

2. "Unsolved" or current problems:

   a. _____

   b. _____

Exhibit No. 5A

PES Chapter Member/Technical Committee WG

Chapter Contact: Name _____

Address _____

Phone ( ) _____

1. Chapter Affiliation? _____

2. Name of PES technical committee working group or interest?

_____

3. Indicate method of participation:

- Corresponding member _____
- Attend scheduled meeting _____

Note: Corresponding member requires significant and useful contribution to maintain membership on WG.

TECHNICAL PROGRAM DEVELOPMENT IDEAS

- NEW PROGRAMS/IDEAS
- PRIZE PAPER AWARDS
- STUDENT PAPERS

STUDENT PARTICIPATION

- INCREASE STUDENT MEMBERSHIP
- TECHNICAL COUNCIL ROLE
  - SUGGEST TECHNICAL PROJECTS (ON-CAMPUS)
  - ADVISOR/COUNSELOR TO STUDENTS/EDUCATORS
  - STUDENT REPORTS AT SUMMER/WINTER MEETINGS
    - PUBLICATION IN PES REVIEW, SPECTRUM, PA&S
    - TECHNICAL COMMITTEES
  - PES AWARDS

SUMMARY

- CHAPTERS COUNCIL -- ROLE & ORGANIZATION
- CHAPTERS NEEDS -- AN APPEAL TO TECHNICAL COUNCIL
- TECHNICAL/CHAPTERS COUNCIL PROGRAM
  - IDEAS & PROGRAM IMPLEMENTATION
- TECHNICAL COUNCIL LIAISON FROM CHAPTERS COUNCIL

COLLEGE OF ENGINEERING

ELECTRIC UTILITY MANAGEMENT PROGRAM
Box 3-O/Las Cruces, New Mexico 88003
Telephone (505) 646-3115

ATTACHMENT V

MEMORANDUM

TO: PES Technical Council

FROM: W. H. Kersting, Chairman
Power Engineering Education Committee

DATE: July 15, 1983

SUBJECT: Student Project Procedure

A suggested procedure is as follows:

a. Technical Committees prepare a one page description, with references, including name and phone number of technical committee advisor. PEEC is to suggest a format.*

b. The descriptions would be forwarded to PEEC. PEEC would send invitations to professors on PEEC and at other universities with a power interest.

c. Academic advisors would contact technical committee advisor with a copy to PEEC.

d. Student starts and completes project with frequent contact with faculty and technical committee advisor. Academic credit for this work would be highly desirable.

e. Papers prepared would be reviewed by the technical committee with presentation at Chapter, Section or National Meeting, and publication in Power Apparatus and Systems or IEEE Student Journal.

f. PEEC would select yearly winner using technical ratings from technical committee.

g. The Technical Council Awards Committee will provide the prize and travel and living expense.

* PEEC will create a "Student Projects Working Group" to perform all PEEC functions proposed in this procedure.

WHK/khs

Appendix 1B

REPORT OF PES STANDARDS CO-ORDINATING COMMITTEE ACTIVITIES

D. A. YANNUCCI

The PES Co-ordinating Committee met on Monday, July 18 at the 1983 Summer Power Meeting.

There was a suggestion that C-76 Appartus Bushings become a part of C-29 Insulators for Electric Power Lines. This was discussed and it was concluded that the work of C-76 is presently being done in the transformer committee and that C-76 can be terminated.

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2. Recommended Performance for Distribution Type Polymeric Insulators - Transmission and Distribution

POWER ENGINEERING SOCIETY

Technical Council
Meeting of July 18, 1983

The Technical Council (T.C.) met in Los Angeles, California on July 18, 1983. Mr. Yannucci attended the meeting in the absence of Leo Savio. The following highlights the items of interest to the committee:

1. T.C. requested each technical committee survey their membership as to their willingness to buy bound volumes of PA&S Transactions at a suggested cost of $150.00 per set. See attached. Discuss.

2. T.C. requested that a member from each technical committee be assigned to a Tutorial Subcommittee. Half day tutorials were suggested. Discuss.

3. The Chapter Council (Mr. Fiedler) requested a closer cooperation between the Chapters and Technical Committees such as notification of time and location of meetings. See attached. Discuss.

4. Student participation is being encouraged by the T.C. It has been suggested that students be given projects to work on with their professors which would result in the generation of a technical paper. See attached. Discuss.

5. T.C. reorganization is on hold until Publication Committee makes their recommendation.

check 6. T.C. needs liaison to the Public Affairs Council. Discuss.

7. New Delhi, India has requested to become involved without attending meetings as a corresponding member. Discuss.

ATTACHMENT III

IEEE

POWER ENGINEERING SOCIETY

Please address reply to:

Publications

The PA&S Transactions and the Review have been running reasonably within budget considering that the authors have been gradually increasing the length of the one page summaries,which has increased the number of pages in the Review. The Review is now running about 700 pages per year and the 1983 budget was prepared on the basis of 600 pages.

We should hold the page budgets constant for the 1984 year at the same level we have had in the past, 4500 pages for the PA&S transactions and 700 pages for the Review. This page allotment will allow the following number of papers to be presented at the various meetings in 1984:

1984 Winter	220
1984 Summer	200
1984 JPGC	25
1984 T&D	140

The costs of 1982 Bound volumes, based on 400 copies, follow:

Binding,all other associated costs	$14,918
Solicitation	4,120
Wrapping/shipping(Set) $2.00	
Mailing Cost-- destination dependent.($12 avg)	
Original production cost set,incremental $12.00	

Based on the above costs the 1982 bound volume cost to the PES is $74.00. Suggest a member price of $150.00 per set and a non-member price of $300.00 (agreement with HQ required)

The inventory of bound volumes from past years,available for sale,is:

1974 - 233 sets	1977 - 211 sets	1980 - 315 sets
1975 - 233	1978 - 300	1981 - 31
1976 - 91	1979 - 410	

The publications department has received requests to add the 1st and last page numbers to the one page summaries and also indicated the discussors of the Transactions paper by listing the names in the Review. We plan to implement these suggestions.

C. J. Essel, Editor, Transactions and Review
July 15, 1983

Power and Life

Appendix 1C

TECHNICAL PAPER FOR POWER GROUP MEETINGS

D. A. YANNUCCI

A total of fifteen papers were submitted for the Winter IEEE Meeting in Dallas. Of the fifteen papers six were accepted. However one of the papers was withdrawn by the author who elected to submit it to the 1984 T&D Conference. Three papers were rejected outright and the remainder were rejected but revision would be reconsidered.

There will be two transformer sessions on January 30, 1984; one at 9:00 A.M. and one at 2:00 P.M.

Special thanks is to be given to all the reviewers. The reviewers did an outstanding job in returning their review sheets and 100 word summaries.

The 1984 T&D Conference will be held in Kansas City on April 29 - May 4, 1984. Two papers have been received for reivew to date.

Appendix ID

Bushing Subcommittee - L.B. Wagenaar

The bushing subcommittee met at 8:00 A.M. on November 8 with 9 members and 4 guests present.

The minutes of the Atlanta meeting were approved as written.

Reports were received from both of the working groups:

1. The Working Group on Bushing Loading met on Monday to discuss methods for obtaining thermal constants for bushings within the scope of the bushing loading guide developed in P757. Two general approaches were discussed. Either the "worst case" constants can be developed and used or somewhat more accurate constants can be obtained from bushing manufacturers. It was decided to try the latter option. Some users have already requested these constants for bushings listed in C76.2.

2. The Working Group on Bushings to Operate in Gas Insulated Substations also met on Monday. As indicated at the last meeting, the group is attempting to locate knowledgeable people in the GIS field to advise on several aspects of a document which will cover bushings to interface between transformers and GIS. To this end, the working group will contact individuals from Working Group 70.1 of the Substations Committee as well as transformer manufacturers who have applied these bushings. Specific problems being addressed by the working group at this time are dielectric tests, pressure tests and thermal coordination between the GIS bus and bushing.

The subcommittee covered several additional items in its meeting:

1. Our attempt to have the Bushing Load Guide (P757) included in the Bushing Application Guide has apparently been successful. Work is underway within C76 to write the foreward of the Bushing Application Guide, which will now include a scope and purpose and sections on allowable top end line pull and loading above nameplate rating of bushings applied to transformers. The table of contents of the document will indicate additional topics which are planned for inclusion but not yet complete.

2. In a related matter, the subcommittee reviewed this list of unfinished items. We decided that the most important items at this time were the interrelated applications of bushings to contaminated environments and high altitudes. Attention also needs to be given to GSU applications using 105°C isolated phase bus.

3. As reported at the last meeting, the results of the subcommittee ballot of P800.1/d1 - Application of Bushings in Conservator Type Transformers - were 10 approvals, 4 approvals with comment and 1 abstaining vote. Comments were reviewed yesterday and pending resolution of one comment, P800.1/d2 will be sent out for ballot in the Transformers Committee.

4. Work continued on resolving comments to the subcommittee ballot of P21/d3 (Revision of C76.1-1976). It was suggested at the Transformers Committee meeting on November 9 that the revision also include minimum size requirements for liquid level gages.

Appendix 1E

Meeting Minutes
of the
DIELECTRIC TEST SUBCOMMITTEE

November 8, 1983
Dearborn, Michigan

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

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

The membership now stands at 62.

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

Working Group on Revision of Dielectric Tests

Chaired by G. W. Iliff

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix 1F

DRY TYPE TRANSFORMER SUBCOMMITTEE REPORT TO THE TRANSFORMERS COMMITTEE

The Dry Type Transformer Subcommittee met at 1:15 p.m. on November 8, 1983, with 10 members and 13 guests present. The W.G.'s reported as follows:

W.G. on Standards for Dry-Type Transformers Incorporating Solid Resin Encapsulated Coils chaired by Mr. Ed Huber met on Monday with 21 members and 7 guests present. Most of the time period was devoted to Task Group meetings. Task Group II has completed approximately one half of their review of paragraphs 3.1 through 5.10, 5.12, and 6.5.2 of C57.12.01. Task Group III has considered and recommended to the W.G. that the three temperature rise categories presently in C57.12.01 be retained. It is also studying the subject of flammability. Task Group IV is studying test requirements and procedures. It has made an initial recommendation regarding partial discharge tests. Mr. Huber plans to retire and resign this W.G. chairmanship prior to our next meeting. At this time I would like to thank him for his diligent effort in organizing and leading this W.G. Mr. Egon Koenig has agreed to chair this W.G.

Dielectric Problems W.G. chaired by Mr. Jerry Corkran met on Monday with 9 members and 11 guests present. Draft 4 of P745 "Guide For Conducting a Transient Voltage Analysis of a Dry Type Transformer Coil" now has been approved by a valid Subcommittee ballot. A ballot in the Transformers Committee prior to the next meeting is planned.

W.G. To Revise Loading Guide C57.96 chaired by Mr. Bill Mutschler met on Monday with 11 members and 6 guests present. A complete draft based on the section work assignments made at the last meeting was distributed. There was considerable discussion of Table 96.01.250 titled "Daily Loads Above Rating to Give Normal Life Expectancy". The discussion concerned the values and the basis for their calculation. A Task Force was appointed to resolve these questions. Mr. Manning presented a curve showing ageing data obtained from an earlier survey.

Dry Type Transformer Fault Duration Guide W.G. chaired by Mr. Roy Uptegraff met on Tuesday with 9 members and 8 guests present. An initial proposal based on the liquid filled transformer fault duration guide was discussed from several points of view. The portion from 25 times to 6 times normal base current was felt to be generally applicable at this time; there are differences of opinion regarding the remainder.

Thermal Evaluation W.G. chaired by Dr. George Bowers met on Monday with 11 members and 10 guests present. The objective of this W.G. is development of a thermal evaluation procedure applicable to solid cast and resin encapsulated winding insulation systems. A document prepared by the chairman for discussion purposes was reviewed and a number of suggestions were made by those present. A new project authorization request is being made; the proposed title is "Thermal Evaluation of Insulation Systems for Solid Cast and Resin Encapsulated Power and Distribution Transformers".

Mr. Jonnatti and Mr. Rodden have been added to the Subcommittee membership.

B. F. Allen

Appendix 1 G

GENERAL ELECTRIC

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

Copies:

November 21, 1983

C. F. Burke
C. C. Crichton
D. L. Hillhouse
H. R. Lucas
Singson Lee
J. E. Lyles
O. Petersons
J. M. Carr
W. R. Ossman
L. S. Corey
O. R. Compton

MINUTES OF IEEE INSTRUMENT TRANSFORMER SUB-COMMITTEE MEETING AT HYATT REGENCY DEARBORN, MICHIGAN, 11/7/83 AND 11/8/83

PRESENT:

MEMBERS	ALTERNATES	GUESTS
L.R. Smith	J.L. Puri(1)	R. Jacobsen
J.N. Davis	M.Y. Ryadhyaksha(2)	J. Morrison
R.A. Magill	J. Gotal(3)	S.W. Arnold
E. Basso		W. Hennong
R.C. Thomas	(1) for E. Conner	R.W. Simpson, Jr.
R.B. Stetson	(2) for P. Falkouski	
	(3) for W. Morehart	

The meeting opened at 1:13 P.M., 11/7/83, Chairman Thomas presiding.

Mr. Basso, Chairman of the Task Force on Thermal Capability of Current Transformers, distributed a summary of responses to his questionnaire. The questionnaire had been sent to metering personnel, at 100 investor-owned utilities and 20 public agencies. Mr. Basso received 42 responses, of which 36 expressed a desire for in coverage of current transformer overloading capabilities, and 6 were not interested.

Mr. Basso had the following conclusions after reviewing responses to the questionnaire.

1) Users desire the addition of material on overload capability of current transformers to C57.13.

2) Users desire that such material cover all voltage ranges.

3) Most users would accept some loss of accuracy during the overload period.

4) Users will not accept residual loss of accuracy after the overload has been removed.

MINUTES OF IEEE INSTRUMENT TRANSFORMER
SUB-COMMITTEEMEETING AT HYATT REGENCY,
DEARBORN, MICHIGAN, 11/7/83 and 11/8/83

Mr. Basso commented that overloading has at times been a factor in intertie metering.

Discussion brought out that an appropriate quantitative document would require thermal-time-constant determination on a wide variety of designs and determination of an appropriate relationship between temperatures and thermal degradation rate for a wide variety of insulating materals. This extensive investigation would lead, at best, to quantitative coverage adequately conservative for general application. It was agreed that in view of the variety of designs and materials involved, and in recognition that instances of current transformer failure attributed to thermal overloading are infrequent, the need for such quantitative coverage does not justify the program required to provide the background.

Mr. Basso will draft material proposing coverage with application recommendations, including the information that certain designs will show significant accuracy changes when operated beyond the rating factor, whereas other designs wll show very small accuracy changes. Mr. Basso will also consider material based on the assumption that average winding rise is proportional to current squared, assisting the user to assess the advantage obtained from a low initial loading, and also permitting estimation of the ultimate temperature rise for a given current.

The minutes of 6/21/83 and 6/22/83 meeting of the Sub-Committee were approved, with the correction that symbol "θ_x" should be added in 2 places and "θ" in one (ref. items 28 & 29 on page 4 of the minutes.

Mr. Stetson distributed a 11/7/83 summary of activities of the American National Standards Committee on Power line Carrier Equipment and Capacitor Voltage Transformers, C93 (attachment A).

The remainder of the meeting was deviated to the revision of C57.13, working on 6/22/83 material through Section 6 previously distributed by Mr. Stetson and on a draft of Section 7 Voltage Transformers distributed by Mr. Gotal. Changes made on this material included:

MINUTES OF IEEE INSTRUMENT TRANSFORMER
SUB-COMMITTEE MEETING AT HYATT REGENCY,
DEARBORN, MICHIGAN, 11/7/83 AND 11/8/83

1) Addition of one comma in definition of bushing-type current transformer.

2) In 4.1.3 (3), change 65°C back to 55°C.

3) In 4.4.1 change parenthetical material to "(or below rated times continuous-thermal-current rating factor)".

4) In Fig. 1, hyphenate "continuous-thermal-current", show "(RF)" after "....RATING FACTORS".

5) In Table 3, restore values in "wet" column (not in "dry" column).

6) In 4.7.1, delete superfluous "tests".

7) In 4.7.3.2 f), change to read "Switching impulse test if applicable (see Table 3)".

8) In 4.7.4 d) add "RIV".

9) Under "X" for voltage transformers (in Table 5) change "multiple" to "parallel".

10) Use space in thousandths position if more than 9999. (no change, continuation of previous practice)

11) 7.1 (4), delete "according".

The meeting adjourned at 4:45 P.M.

Ralph B. Stetson
Secretary

/fd

1072E

MEETING OF 11/8/83

PRESENT:

Members	Alternates	Guests
L. R. Smith	T.L. Kashalk (1)	R. Jacobsen
J. N. Davis	J.L. Puri (2)	S.W. Arnold
R. A. Magill	M.Y. Rajadhyaksha (3)	J. Nelson
E. Basso	J. Gotal (4)	
R. C. Thomas		
R. B. Stetson	(1) for J. Walton	
	(2) for E. Conner	
	(3) for P. Falkowski	
	(4) for W. Morehart	

The meeting opened at 8:04 A.M., Chairman Thomas presiding.

Review of the section 7 material provided by Mr. Gotal on 11/7/83 continued with agreements including:

1) After considerable discussion, 7.2.1 was shortened to read: "Standard burdens for voltage transformers are shown in Table 17", 7.2.2 was eliminated, Table 17 was clarified by incorporating vertical divisions, and the following note was added to Table 17:

   "The standard burden volt-amperes and power factor apply at rated secondary voltages of 120 or 69.3 volts. For rated secondary voltages from 108 to 132 volts or from 62.4 to 77.2 volts, the above impedances apply. For other secondary voltages the above volt-amperes and power factor apply at the rated secondary voltage, requiring recalculation of the impedances." Refer to Attachment B for additional comments:

2) 7.3.1 change "designed" to "rated".

3) 7.3.2 eliminate "desired".

4) 7.5, 3rd line, add "(see Table 5)".

5) 7.5, remove (8).

6) 7.7 at end, to read: "The limiting temperature shall be 250°C for copper conductors..." and continue with remainder per 6.6.2.

7) Tables 12-16

"Grd" instead of "Gnd"
Spell out "WYE" in text

Groups 1 and 4a, govern the 125% requirement by "without exceeding 105°C average winding rise".

Group 1, WYE application, " effectively grounded"
Group 1, add "These capabilities do not preclude the possibility of ferroresonance"

Group 2 and 4B add: "The thermal volt-ampere capability at this voltage will be less than the thermal burden rating at rated voltage"

Group 3, describe as "outdoor"
Group 5 "...175°C temperature rise for copper conductor or 125°C rise for EC aluminum conductor"
Misc. editorial changes

The Sub-Committee then reviewed the draft material for Section 8, using draft previously provided by Mr. Hillhouse. Many previous changes were confirmed. Additional agreements were:

8.4.1, delete " and the same ratio"
8.4.2, delete " same ratio and"
8.4.2.1 (3) last sentence: If the ammeter reads the difference of the currents in the high-turn windings, the polarity of the unknown transformer is as marked."

Fig. 26, delete "same ratio and".

Ed. note: Altho not discussed, Grps 1, 3, and 5 should use same values in 12000/20780Y or 14400/24940Y coverage

8.5 (1) replaced old text with: "(1) For calculation of relay accuracy of "C" or "K" type current transformers".

8.6.2, 3rd par. "The calculated maximum temperature..."
Wherever used, the 225°C "T" for aluminum must be restricted to EC aluminum

On several pages, text and formulas related to short-time thermal considerations must be redone to correlate with changes in 6.6.2 and 7.7. The Secretary will propose new coverage as required.

8.6.3, last paragraph, change "normally will" to "may'.

Several places, use metric in place of English dimensions or as first alternate.

8.7.8 7th par., " For 55°C or 65°C rise..."
8.7.9, 3rd par, delete
8.8.2, reword several places to cover "by the user" instead of "in the field" etc. Add "initial" aganst 75% test level. Use "dc" instead of "direct"
8.8.3, "potential" becomes "voltage"
8.8.4, " " "
Table 18, " " "
8.8.5.6, 2nd par, 2nd sentence, "One terminal.."
Next sentence "...for its BIL rating."
Fig. 30, several changes to clarify identify of oscilloscope depiction.

In 6.4.1 (3), proposed coverage of "K" classification, reduced "80 percent" to "70 percent". (Mr. Walton, who had been a primary advocate of this new requirement, wrote to the Secretary on 11/3/83 to recommend this less restrictive value).

Mr. Basso offered to compile a formal draft. Mr. Gotal will forward to Mr. Basso latest coverage for Section 6, and the Secretary will forward the remainder, with a target date of January 28, 1984. The draft will have the -1978 material in one column (the present column) and new material on the other column. Only changed new material will be shown. New draft will use both sides. As Mr. Basso has the "present" material set-up, he is basically requesting the new material, with size reduced (if necessary) ala Mr. Hillhouse's copy. Mr. Basso will distribute the new draft to Sub-Committee members.

Mr. Thomas will request a one-year extension of the revision period.

The next meeting was left to call of the Chairman.

The meeting adjourned at 2:56 P.M., having recessed for lunch from 11:50 to 1:15.

Respectfully Submitted,

Ralph B. Stetson
Chairman

/fd
1072E

11/7/83

ATTACHMENT "A"

SUMMARY OF C93 ACTIVITIES

The last meeting of American National Standards Committee on Power Line Carrier Equipment and Capacitor Voltage Transformers, C93, was held on the RMS Queen Mary, Long Beach, California on July 13, 14 and 15, 1983. The next meeting will be in the Yankee Trader Hotel, Fort Lauderdale, Florida on December 1 and 2, 1983.

Based on minutes of the last meeting:

1) C93.1-1981 Coupling Capacitors and C93.2-1976 Requirements for Power-Line Capacitor Voltage Transformers-a combination of these two documents into C93.2 will be prepared for discussion at the next meeting.

2) C93.3-1981 Requirements for Power-Line Carrier Line Traps-no specific discussion.

3) C93.4-198X Requirements for Power Line Carrier Line Tuning Equipment - proposed material was reviewed. C93.4-198X will be prepared for balloting in the C93 Committee prior to 11/30/83.

4) C93.5-198X Requirements for Power-Line Carrier Transmitter Receiver Equipment - this was apparently discussed at some length, with considerable further work planned for the future.

The minutes of the last meeting were issued by John D. Hopkins of NEMA staff.

Ralph B. Stetson

/fd

1029E

ATTACHMENT B

TO MEMBERS OF IEEE IT SUB-COMMITTEE

Subsequent to our 11/8/83 discussions, I have had the opportunity to consider Table 17 and the proposed notes. The combination of the -1978 note and the note we developed 11/8/83 seems to me more awkward than either note alone, altho we are apparently in agreement as to the intent of each note.

The note will establish that the standard burdens are defined at rated secondary voltage (the -1978 note is based on the approach that when a transformer rated at 120 (or 115) secondary volts is tested at 58% of rated voltage the standard burden would be defined by VA and PF at the test voltage.) The -1978 note eliminated different interpretations which had occurred at some earlier time, and has been used as the basis for published accuracy.

We arrive at a conflict between the two notes. The ideal solution, I believe, would be elimination of the -1978 note, leaving the standard burden defined entirely by rated voltage, regardless of test voltage. Unfortunately, there were and may be objections to holding burden impedances (once properly established at rated voltage) constant down to 58% of rated voltage. Also, some published accuracy ratings would be obsoleted. In my opinion, this approach is not the most practical one.

I suggest that our 11/8/83 note, slightly modified, permits simplification and coordination of the -1978 note, and that the combined coverage might read:

"NOTE 1. If rated secondary voltage is 120 or 69.3 volts, the standard burdens are defined by the characteristic volt-amperes and power factor. For rated secondary voltages from 108 to 132 volts or from 62.4 to 76.2 volts, the standard burdens are defined by the characteristic impedances on 120 or 69.3 volts basis respectively. For other rated secondary voltages the standard burdens are defined by the characteristic volt-amperes and power factor; the characteristic volt-amperes apply at rated secondary voltage and appropriate impedances required.

ATTACHMENT B
MEMBERS OF IEEE SUB-COMMITTEE

NOTE 2: The standard burdens established at rated secondary voltage in accordance with note #1 shall apply at all test voltages, except:

a. When transformers with 120 or 115 rated secondary volts are to be tested at secondary voltages from 51.9 to 63.5% of rated secondary voltage, the standard burdens are defined by the characteristic impedances on 69.3 volt basis.

b. When transformers with other than 120 or 115 rated secondary volts are to be tested at secondary voltages from 51.9 to 63.5% of rated secondary voltage, the standard burdens are defined by the characteristic volt-amperes and power factor; the characteristic volt-amperes apply at 57.7% of rated secondary voltage and appropriate impedances are required."

Although we had hoped to stabilize this material in our meetings, I suggest we address the question before it arises in comments. Possibly Mr. Gotal can incorporate some elements of these suggestions in his draft for Section 7.

Ralph B. Stetson

Ralph B. Stetson

/fd

1055E

Appendix 1H

REPORT OF THE INSULATION LIFE SUBCOMMITTEE
TO THE TRANSFORMERS COMMITTEE
November 9, 1983
Hyatt Regency Hotel, Dearborn, MI

The Insulation Life Subcommittee met yesterday, November 8, 1983, with a total attendance of 53, composed of 22 members and 31 non-members.

It was announced that Joe Gorub of Baltimore Gas & Electric, and Colin Lindsay, of Ontario Hydro, have retired from their companies. Joe Pollit has replaced Joe Gorub for Baltimore Gas & Electric, and Vic Shenoy has replaced Colin Lindsay for Ontario Hydro. We also welcomed Thomas Traub of Commonwealth Edison to membership.

Ron Olsson, Chairman of the Loading Guides Working Group, reported that his group met Monday with an attendance of 29, of which 22 were members and 7 were guests. Ron reported on the status of the Trial Use Loading Guide for Transformers Above 100 mVA. Charles Mitchell has been shepherding the galley proofs through proofreading. They have been proofread and returned to IEEE Publications. He expects to have the them reviewed and ready for publication in December and final publication soon after. Chuck, as usual, has learned some lessons on how to expedite this process, and he is willing to share this knowledge with others who are about to undertake this task. Some of his suggestions for expediting the editing process are:

- Contact the editor, find out what you can do to aid him.
- Do most of the art work yourself if possible. This could save up to six months in time.
- Develop a timetable for who does what and when.
- Be aware that the publication editors may change some wording and they may unintentionally change the intent of a statement, so carefully check their work.

I am sure Chuck has more nuggets that he will be glad to share with you if you are about to enter a similar task.

Bill Wrenn reported on the results of the Transformers Committee ballot of the Step Voltage Regulator Loading Guide, C57.95/Draft 5. The ballot achieved approval with successful resolution of only one negative ballot. Bill will now forward the document to the IEEE Standards Board along with necessary documentation of the balloting.

The Working Group still has not been able to contact the volunteer chairman for the Task Force on the Current Limiting Reactor Loading Guide revision. We have given up on him and are now trying to obtain someone else with the help of Russ Minkwitz. This has been a very frustrating project. If this next prospect does not work out, we will have to either abandon the project or obtain a volunteer chairman from a utility that feels strongly about the need for such a guide. We just have not been able to secure a volunteer chairman from the manufacturers of this apparatus.

We had no report from our liaison member on the progress of the revision of the IEC Loading Guide, but we have unconfirmed reports that the first draft will probably be rejected and will need extensive revision because of its length and complexity.

We still need volunteers for task forces to start on any proposed revisions of C57.91 and .92 Loading Guides when they come up for revision in 1986. Olin Compton is heading the C57.91 Distribution Transformer Guide, and Jan Ottevangers is heading the C57.92 Power Transformer Guide Guide, 100 mVA and below. Bill McNutt has suggested that since the Trial Use Guide for ratings above 100 mVA will be up for reaffirmation or revision as a permanent guide in 1984, we should consider combining the above 100 mVA with the C57.92 guide.

Our next Working Group, the Thermal Evaluation of Power and Distribution Transformers, also met Monday, but the Chairman, Al Wurdack, had to leave early, so I did not have an attendance count, or written report. However, the work load was light, and I was able to report for him.

The reaffirmation of the Procedure for Thermal Evaluation of Distribution Transformers that has been approved by the Transformers Committee is still apparently in limbo at headquarters, due to some questionable responses from some coordinating committees. There is a question as to whether changes in dates of referenced standards constitute a requirement for reballoting in the Transformers Committee. We have not been able to obtain a ruling from headquarters on this point. Hopefully we will get a favorable ruling from them so that this roadblock can be overcome before the next meeting.

In other business Bob Grubb has volunteered to prepare a statement for the next revisions of this procedure to deal with the desirability of obtaining gas analysis and water content in the oil during or after the test procedure with the intent of gathering data on the correlation of aging and content of these aging by-products.

Bob Veitch, Chairman of our Thermal Tests Working Group, reported that they met Monday and had 15 members and 10 guests. Discussion was concerned only with the preparation of the "Recommended Procedures for Performing Temperature Rise Tests of Oil Immersed Power Transformers at Loads Greater than Nameplate Rating." Draft #7 of this new document has been mailed to task forces and the working group. The closing date for the ballot is December 24, 1983. I am sure Bob Grubb, chairman of this task force, will have a very Merry Christmas if you shower him with approved ballots on Christmas Eve. Or, if not approved, at least helpful suggestions for improvement of the procedure. Bob led a discussion of changes made in this latest draft. In an attempt to resolve what has turned out to be the most controversial issue, the task force has suggested a method of determining the incremental current required to account for the contribution of core losses during Part B, the Transient Loading Test. Dr. Lampe of ASEEA made a proposal at this meeting that may further simplify determination of the incremental current.

In the area of new business, it has been proposed that the Thermal Evaluation Working Group initiate a project to prepare a thermal evaluation procedure for power transformers similar to the one for distribution transformers.

We have not as yet appointed a chairman for this task force, but we hope to have one by the next meeting. The completion of the two recent EPRI projects on this subject have generated enough information to give us an excellent start on such a procedure.

Al Goldman suggested that this subcommittee should give consideration to a short duration quality control type heat run test for power transformers. This is based on his experience with detection of some quality defects that were revealed in conventional heat run tests on duplicate designs. There was considerable discussion of the merits and demerits of such a test, but there was no clear consensus. However, the Thermal Tests Working Group was requested to study the proposal and make recommendations at a future meeting of the Subcommittee.

This concluded the Subcommittee meeting.

C. J. McMillen

November 9, 1983

APPENDIX II

November 14, 1983

TO: IEEE TRANSFORMER COMMITTEE
Insulating Fluids Subcommittee Members

FROM: Henry A Pearce, Chairman

SUBJECT: Minutes of Meeting held November 7 & 8, 1983 in Dearborn, Michigan

MEMBERS PRESENT

L. Baranowski
D. Crofts
M. Frydman
P. Hoeffler
O. Keller
J. Kelley
G. McRae
E. Morrison
S. Northrup
T. Rouse
L. Savio
J. Thompson
R. Vincent

GUESTS PRESENT

Jesus DeLeon	Texas Power & Light
L. Wagenaar	American Electric Power
M. M. Sperry	Analytical Associates
K. D. Mills	Texas Power & Light
A. L. Rickley	Doble Engineering
S. N. Lovelace	Kaiser Aluminum & Chemical Corp.
George Bryant	Dow Chemical
Juergen Gerth	Brown Boveri
J. P. Germain	Hydro-Quebec
Charles Brown	Florida Power & Light
W. Boettger	Federal Pacific

The Insulating Fluids Subcommittee met on Monday and Tuesday, November 7 and 8, 1983, with fifteen (15) members and fourteen (14) guests present.

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

2. Membership changes include: the addition of Mr. J. P. Germain of Hydro-Quebec to replace Mr. J. E. Dind who is deceased and Mr. Tor Orbeck of Dow Corning to replace Mr. Lou Gifford.

3. The chairman reported that IEEE Headquarters has stated that the "Guide For Reclamation Of Insulating Oil And The Criteria For Its Use" is currently at the printer and should be issued before the end of 1983.

4. Project P799, PCBs - The results of a subcommittee letter ballot on Draft 3 of Project 799, "Guide For Handling And Disposal Of Transformer Grade Insulating Liquids Containing PCBs" were reviewed and discussed. There were two negatives and several comments. The subcommitee made several changes and corrections in an effort to resolve the negative votes. It was then voted to prepare Draft 4 and again submit for Subcommittee Ballot.

5. Project C57.111, Silicone - Draft 3 of the "Guide For Acceptance And Maintenance Of Silicone Liquid In Equipment". Project C57.111 had also been sent out for Subcommittee ballot. There were 6 negative ballots and many editorial comments. Considerable time was spent reviewing the objectives and comments. This resulted in extensive revisions and changes and it was voted to request the Working Group to prepare a Draft 4 and resubmit for Subcommittee Letter Ballot.

6. Project P954, High Temperature Hydrocarbons - The Task Force on the "Guide For Acceptance And Maintenance Of High Temperature Hydrocarbon Liquid In Equipment" presented a preliminary draft of this guide for the Subcommittee members to review and submit comments.

7. Project C57.104, Gas Guide - The Working Group to initiate a revision of Project C57.104, Gas Guide, met on Monday afternoon, then discussed the project with the subcommittee on Tuesday. It was agreed to prepare and conduct a survey to determine uses and needs of the Gas Guide users and to determine limits and guidelines presently being used.

   We again invite all members of the Transformers Committee to give us their comments on the Gas Guide. These may be submitted to me or to Earl Morrison of Los Angeles Department of Water & Power who is the Working Group Chairman.

8. Adjournment

9. Next meeting - April 1-4, 1984, Harborside City Center, Vancouver B.C.

H. A. Pearce, Chairman
Insulating Fluids Subcommittee

IEEE TRANSFORMER COMMITTEE

INSULATING FLUIDS SUBCOMMITTEE

Membership - November, 1983

CHAIRMAN	H. A. Pearce	Westinghouse Electric Corp. 469 Sharpsville Ave. Sharon, PA 16146 (412) 983-4295

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SAVIO, L. J.	Consolidated Edison Co. of New York, Inc.	4 Irving Place, RM 1320 New York, New York 10003
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GERTH, Juergen	Brown Boveri & Cie	Postback 351 6800 Mannheim West Germany
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Appendix I J

PERFORMANCE CHARACTERISTICS SUBCOMMITTEE
DETROIT, MICHIGAN - NOVEMBER 8, 1983
MEETING MINUTES

I. INTRODUCTION/ATTENDANCE

The Performance Characteristics Subcommittee (PCS) met at 8A on Tuesday, November 8, with 31 members and 42 guests in attendance.

II. APPROVAL OF MINUTES

The minutes of the April 12, 1983, PCS Meeting were approved as mailed.

III. CHAIRMAN'S REMARKS

John Lackey of Ontario Hydro has been accepted as a new member of the PCS.

Ed Troy has retired and has resigned as Chairman of the W.G. on Harmonic Load Current Heating. Bill McNutt has assumed the Chairman's position.

George Bryant has filled the open position as Chairman of the Semi-conductor Rectifier Transformer Task Force.

Transformer Committee Liaisons to C84 and C92 are open; interested persons should contact Leo Savio.

IV. AGENDA

The agenda was accepted as proposed.

V. WORKING GROUP REPORTS

1. W.G. Loss Tolerance and Measurement - D. S. Takach, Chairman

The W.G. met at 8A, Monday, November 7, 1983, with 14 members and 14 guests attending.
Four ballot proposals were discussed.

The Transformer Committee ballot on Draft 5 of Corrections to Load Loss and Impedance Voltage Measurements (P262E/D5) had 9 negatives. Changes to address these were made and will be circulated in the W.G. Pending satisfactory reaction, the Transformers Committee will be re-balloted.

The PCS ballot on Draft 5 of Voltmeter Connections for No-Load Loss Measurement (P262E.2/D5) received only editorial comments. After these are addressed, Draft 6 will be balloted by the Transformers Committee.

The WG continues to discuss the temperature correction for no-load loss measurement. Some data was presented that supports the theoretical method proposed. Issues concerning the application of this method are 1) availability of loss separation data; 2) impact of transformer design on loss separation data, and 3) measurement of core temperature. There was sentiment expressed that consistency may be more important than absolute accuracy. At the PCS meeting, the concern for consistency was again raised. Several members indicated support for restricting measurement to ambient for power transformers; Bill McNutt indicated that this is the CIGRE recommendation.

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

The WG met on Monday, November 7, 1983, with 14 members and 14 guests present. The joint WG and PCS ballot on Draft 2 of Recommended Practice for Establishing Transformer Capability When Supplying Nonsinusoidal Load Currents had 5 negatives. The Chairman produced a third draft for discussion purposes; as a result, Draft 4 will be submitted for joint WG and PCS ballot.

The Task Force on Semiconductor Rectifier Transformers also met twice on Monday. An initial draft was discussed.

3. WG Transformer Reliability - H.F. Light, Chairman

The WG met at 1P on Monday, November 7, 1983, with 16 members and 13 guests present.
The Transformer Committee ballot on Draft 5 of the Reliability Guide received 9 negative ballots and numerous other comments. This feedback was discussed at a Task Force meeting on Sunday afternoon. It is felt that most of the objections can be resolved through editorial changes and discussions with those involved. One issue concerning litigation issues remains unresolved; Mr. Light is seeking additional legal opinions from EEI and IEEE law departments. A sixth draft will be prepared for Transformer Committee ballot after the legal opinions are obtained.

4. W.G. Qualification of Transformers for Class 1E Application in Nuclear Power Stations - L.R. Stensland, Chairman

The W.G. met on Monday, November 7, 1983, with 4 members and 3 guests present. Comments received on the Draft 12 (P638/D12) ballot of the NPEC SC-2 Committee were discussed. Draft 13 will be prepared, again for NPEC SC-2 ballot only.

5. W.G. Transformers Connected to Generators - D. A. Yannucci, Chairman

The W.G. met at 1P on Monday, November 8, 1983, with 10 members and 3 guests present.
Mr. Patel chaired the meeting in Mr. Yannucci's absence. Draft 3 of the Guide continues under review.

6. Short Circuit Duration - W. F. Griffard

No meeting; the Guide has been approved by the IEEE Standards Board.

7. Ratio Tolerance - C. M. Gardam

Draft 3 of the Wording for Ratio Tolerance in C57.12.00 was successfully balloted in the PCS with editorial comment. Draft 4 will be prepared and balloted by the Transformer Committee.

8. C57.12.80, 4.1.6.1 - J. C. Dutton

No report.

NOTE: Transformers Committee Secretary, Olin Compton, requested that for full committee ballots, he be provided a list of those members <u>not</u> returning their ballots.

VI. OLD BUSINESS

1. Failure Analysis Guide

A Working Group to develop a guide for failure investigation and analysis has been established and will begin meeting next spring. Mr. Light has developed a scope outline which will be submitted with the Project Authorization Request. D. J. Cash has agreed to chair the new W.G. (subject to approval) and approximately 20 members have indicated an interest in participating.

VII. NEW BUSINESS

1. Telephone Influence Factor (TIF) Test

Mr. Arnold, REA, has requested inclusion of reference to a TIF test in C57.12.00. A Project Authorization Request will be filed; C. P. Kappeler will coordinate this action.

VIII. NEXT MEETING

The next meeting will be held on April 3, 1984, in Vancouver. The meeting was adjourned at 8:50A.

John D. Borst
Chairman

2270e

Appendix 1K

REPORT
OF
THE STANDARDS SUBCOMMITTEE
IEEE TRANSFORMER COMMITTEE MEETING
DETROIT, MICHIGAN
NOVEMBER 7-9, 1983

All subcommittees reported up-to-date status of their projects.

My records have the subcommittee chairmen as listed below:

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

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

Project Status

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

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

C57.12.00, Section 5, and C57.12.90, Section 10 - Dielectric Tests for Transformers. Draft 3 is being balloted in the Working Group and in the Subcommittee.

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

Specific changes related to solid resin-encapsulated coils are being developed.

PC57.18.10 - Semi-Conductor Rectifier Transformer

Work in progress. New Task Force chairman appointed.

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

The new chairman, Jack McGill, of the Working Group has been appointed. He is forming a membership roster for first meeting in Detroit.

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

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

PC57.95 - Loading Guide for Regulators

Draft #5 being balloted in Transformer Committee. Ballots due back July 29, 1983.

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

Some sections of the document have been completed: work continues on the remaining sections.

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

PAR sent back for revision. This project has been renumbered. Was P76

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

Revisions being discussed.

PC57.110 - Harmonic Load Current Heating of Transformers

Ballots due in July 1983 from Performance Characteristics Subcommittee, the Dry-Type Transformer Subcommittee, and the Working Group.

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

Draft #3 ballots being returned now.

P21 - Revision of ANSI C76.1

Comments on Draft #3 being reviewed in Subcommittee.

P24 - Revision of ANSI C76.2

Approved by Standards Board according to November 1, 1982 Standards Board Status Report.

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

C57 approved this for submission to ANSI BSR, but it is not clear where it stands. J. C. Dutton is checking. Now out for public review according to November 1, 1983 Standards Board Status Report.

P76 - This project was renumbered to C57.102.

P93 - Transformer Impulse Tests (C57.98)

Still being balloted in ANSI C57.

P262E - Revision of C57.12.90 Loss Tolerance and Measurement

X P262E/D5 - Proposed addition to C57.12.90, Section 9.2.4.2. Corrections to Load Loss Measurements. Being balloted in Transformer Committee. Ballots due in 10/07/83. Ballot is on section 9.2.4.2.

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

X P262E.2/D5 - Proposed addition to C57.12.90, Section 8.3.2.1 and deletion of Section 8.3.3. Voltmeter connection for no-load loss measurement. Being balloted in the Performance Characteristics Subcommittee with returns due 10/31/83.

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

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

Submitted to Standards Board. Conducting coordination with other committees - may need reballoting of transformers committee.

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

Draft #3 on hold pending resolution of correction method under P262E.1/D3.

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

Draft #3 being balloted in the Performance Characteristics Subcommittee with returns due 10/18/83.

P513 - Seismic Guide for Power Transformers and Reactors

Balloting completed. Working group chairman still working on transmittal to IEEE Standards Board. New help assigned and progress expected.

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

Still being discussed in working group.

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

Interim meeting of subcommittee in June 1983. Hope to finish revision in Detroit and ballot before the end of the year.

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

In Editorial Staff. Should be out by December 1983.

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

Revision D12 issued to the NPEC/SC-2 Subcommittee in June 1983.

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

No activity reported (see end of report).

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

No activity reported.

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

No activity reported.

P740 - Dielectric Test Requirements for Power Transformers for Operating at System Voltage from 69 through 230 kV (C57.XX)

Published for trial use.

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

Still under discussion in the working group.

P756 - Guide for Loading Transformers Above 100 MVA

Approved by the Standards Board for trial use.

P757 - IEEE Guide for Loading Power Apparatus Bushings

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

P784 - Transformer Through Fault Current Duration Guide

Through Fault Duration Guide considered by the Standards Board on June 23, 1983 and approved as submitted. Now at Standards Editor.

P785 - Transformers Connected to Generators

Under deliberation by Working Group.

P786 - Transformer Failure Reporting and Reliability Analysis

Subcommittee is being balloted (D5). Returns due by 10/07/83. A proposed scope for a failure Analysis Guide has been developed.

P799 - Guide for Handling and Disposing of Askarels

Draft #3 ballots being returned.

P800 - Bushing Application Guide

Comments on Draft #1, ballots on P800.1 (Application of Bushings in Conservator Type Transformers) being reviewed in Subcommittee.

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

Draft #7 ballots returned from full Transformer Committee and will be discussed in Detroit. Responses at this point: Total 81, Approved 51, Approved W/C 13, Not Voting 16, Not Approved 1.

P832 - Detection and Measurement of Partial Discharge (Corona) in Instrument Transformers

Moved to P546.

P838 - Guide for Performing Overload Heat Runs

Now preparing Draft #6 for working group ballot.

P842 - Loss Evaluation Guide

Draft #8 was reviewed at 7/21/83 meeting of West Coast Subcommittee. Some progress was made on simplification and definitions.

P852 - Bushings to Operate in Gas-Insulated Substation

Draft #1 in progress in Working Group.

P954 - Task Force is preparing writeup.

There are a few projects which are sort of in limbo.

P670 - Instrument Transformers for High-Voltage Circuit Breakers

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

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

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

Last report was in March 1980 when D. A. Duckett resigned and a new chairman was being sought.

P832 - Partial Discharge in Instrument Transformers

The committee was to investigate to see if this work should be incorporated into C57.13.

Richard Liebich, Chairman of the Sound and Vibration Subcommittee, reports that six Working Groups have been formed and that five of the Working Groups have chairmen and are at work on Project Authorizaton Requests. He has a tentative chairman for the other Working Group.

The Task Force has been formed to review dielectric test requirements for Shunt Reactors, C57.21. W. N. Kennedy will act as chairman.

West Coast Transformer Subcommittee is reviewing work of two other subcommittees in relation to fire protection (P979 an P980).

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

Ray Smith

Ray Smith, Chairman
Standards Subcommittee

Appendix 1M

IEEE/PES TRANSFORMER COMMITTEE

MEETING

NOVEMBER 9,1983

LIAISON REPORTS

STATUS OF IEEE AND ANSI C57 BALLOTS, AND PRINTING

10/4/8

by J.C. DUTTON

ANSI C57 BALLOT NO. OR IEEE PROJ. NO.	BRIEF DESCRIPTION	IEEE SID ED SUBM.	ANSI C57 CCMM SUBM.	ANSI BSR SUBM.	EDIT, TYPESET	PRINTING
353	HVACC, C57.12.55, Dry Type	N/A	#Rebltg. (Neg. Vote)			
356	HVACC, C57.13.2, Inst. Tr.	N/A	C	To Be Subm.		Bltg.
	ANSI/IEEE C57.12.56-198X Dry-Type Insul. Testing (Models) (Formerly known as IEEE 65)	C	C	Subm. (Under Investigation)		
	ANSI/IEEE C57.98-1982 Impulse Test Guide	C	C	To Be Subm.		
	ANSI/IEEE C57.109 Short-Circuit Duration	C	To Be Bltd.			
P756	ANSI/IEEE C57.XXX Loading Guide 100+ MVA	C	~~To Be Bltd.~~			X

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

ANSI C57.12.2 LIAISON REPORT

by C. P. KAPPELER

ANSI C57.12.2 Subcommittee met on April 14 and September 29, 1983. Working groups are busily engaged in reviewing for revision the following standards:

C57.12.20 - First draft has been reviewed, second draft will be circulated to the working group before year end.

C57.12.21 - First draft reviewed, second draft will be circulated to the working group by year end.

C57.12.22 - First draft is in preparation.

C57.12.23 - Final draft approved by the sub-committee; to be processed.

C57.12.25 - Draft V circulated to the subcommittee, with request for comments before November 1, 1983.

C57.12.26 - Final draft approved by sub-committee, awaiting return of galley proofs.

Any proposed changes of C57.12.20 through C57.12.25 should be submitted before 12/31/83 if they are to be included in current revisions.

A proposal to add BIL to nameplate "A" for 19920 voltage on all these new standards is under consideration. It is requested that IEEE Transformer Committee change C57.12.00, Table (7) to indicate this in the general standard, rather than in each specific standard.

ANSI C57.13 LIAISON REPORT
by R.C. THOMAS

There have been no meetings of the ANSI C57.13 Instrument Transformer Sub-committee.

All work on the revision C57.13-1978 is being done by the IEEE Instrument Transformers Sub-Committee. Until the final revision is completed, some time this year, and sent to letter ballot I do not anticipate any meeting of the ANSI C57.13 Sub-Committee.

ANSI C68 LIAISON REPORT
by L.S. McCORMICK

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

ANSI C76 LIAISON REPORT
by N.J. MELTON

ANSI C-76.1 is now being revised in the Bushing Sub-Committee under Project P-21.

Bushing Application Guide (ANSI C-76.3) is now being assembled. The document to be published will contain IEEE 757-1982, "Guide For Loading Power Apparatus Bushings," and a section on cantilever loading.

ANSI C89 LIAISON REPORT
by S. J. ANTALIS

1. No ANSI C89 Meeting was held since the last report.

2. The Technical Committee of NEMA ST-8 Dry Type and Specialty Transformers has requested NEMA members' comment on ANSI C89.1 (NEMA ST-1-1978). This standard is now due for a 5-year interval review.

3. Members of ANSI C89 Committee voted in a letter ballot for adoption of ANSI "Model Procedures for an Accredited Standards Committee." There were no negative votes. This establishes basic Committee operating procedures for the "Development and Coordination of American Material Standards" (Approved by the ANSI Board of Directors, 3/30/83).

Liaison Report

Fall ANSI C62 & IEEE SPD Meetings

by

E. J. Yasuda

The ANSI C62 Committee met on September 15, 1983 in Pittsburgh, PA and the IEEE SPD Committee held its Fall '83 meeting on October 4-7, 1983 in Portland, OR. Brief summaries of these Committees' activities which may be of interest are as follows:

ANSI C62 Committee Meeting

Revisions to ANSI Std. C62.1 was approved by the IEEE Standards Boards. These revisions will be forwarded to ANSI C62 Committee for review and ballot. The major revisions are:

1 - Eliminate all references to expulsion arresters
2 - Created a new section for distribution arresters
3 - Establish a new distribution arrester class (heavy-duty) requiring 100KA 4 X 10 usec. current withstand, 10KA duty cycle test with 2 - 40KA 8 X 20 usec. current at the end and 250A, 2000 usec. long duration current withstand.

Continuing discussions were neld on the new Accredited Standards Committees (ASC). ANSI C62 Committee was recommended by IEEE to become an ASC. The ASC Operating Procedures have not been totally resolved between IEEE and NEMA. The deadline is September 1, 1984.

The U. S. Positions on various IEC documents were formulated in light of the October 17-19, 1983 IEC TC 37 meeting in Tokyo. The metal-oxide standards being developed by IEC TC 37, W. G. 4 still contains requirements not acceptable to the U. S. A new central document will be recommended by the U. S. delegation due to the extensive work within the last two years.

IEEE SPD Committee Meeting

Two new working groups were formed. These are 1) Dispersed Storage and Generation and 2) Separation Effects.

The present W. G. on Surge Protection of Nuclear Power Plants has revised its scope to include all generating power plants at the recommendation of the PES Technical Council. No particular emphasis will be made regarding surge protection of nuclear power plants.

A ballot for the reaffirmation of IEEE Std. 32 on Neutral Grounding Devices will be circulated in SPD before the end of this year. This standard has been reaffirmed in 1979, but due to urgency to complete IEEE Std. 143 on the Application Guide for Neutral Grounding in Electric Utility Systems, revisions to Std. 32 will commence following completion of Std. 143.

10/13/83 EJY

LIAISON REPORT FOR SCC 4.0 AND 4.1 COMMITTEES
IEEE TRANSFORMER COMMITTEE MEETING
NOVEMBER 9, 1983 DEARBORN, MICHIGAN

BY

DR. MELVIN L. MANNING
LIAISON MEMBER

I. STANDARDS COORDINATING COMMITTEE NO. 4

(Insulating Materials and Systems)

E. A. Boulter, Chairman
General Electric Company, Lynn, Massachusetts 01910 (15 members)

Howard Reymers, Secretary
Underwriters Laboratories, 1285 Walt Whitman Road, Melville, New York 11747

The Committee met June 21, 1983, East Board Room, IEEE Headquarters, 345 East 47th Street, New York, New York. By accomplishments of former meetings and this meeting outstanding work has been done for IEEE No. 1, "General Principles for Temperature Limits in the Rating of Electric Equipment and for the Evaluation of Electrical Insulation." This basic standard consists of four parts:

Part I: General Concepts, Scope and Definitions
Part II: Evaluation of the Thermal Capability of Insulating Materials
Part III: Thermal Evaluation of Electrical Insulation Systems
Part IV: Limiting Temperatures and Their Measurement for Electrical Insulation Systems

Principles of this standard are intended to serve as a guide in the preparation of IEEE and other standards that deal with the selection of temperature limits and the measurement of temperature for specific types of electric equipment. Guiding principles are included for the development of test procedures for the thermal evaluation of electrical insulation and insulation systems for use in rating electric equipment.

The companion IEEE standards publications, which complement and extend the concepts outlined in this guide, are:

IEEE No. 96: General Principles for Rating Electric Apparatus for Short-Time, Intermittent, or Varying Duty

IEEE No. 97: Recommended Practice for Specifying Service Conditions in Electrical Standards

IEEE No. 98: Guide for the Preparation of Test Procedures for the Thermal Evaluation of Electrical Insulating Materials

IEEE No. 99: Guide for the Preparation of Test Procedures for the Thermal Evaluation of Insulation Systems for Electric Equipment.

IEEE No. 101: Guide for Statistical Analysis of Test Data Appendix B

IEC publications which relate to this guide are:

Publication 85: Thermal Evaluation and Classification of Electrical Insulation (Presently this guide is at variance with the philosophy of SCC 4.0 Committee for classification by letters instead of temperatures.)

Publication 216: Guide for the Determination of Thermal Endurance Properties of Electrical Insulating Materials.

Publication 493: Guide for the Statistical Analysis of Aging Test Data.

Publication 505: Guide for the Evaluation and Identification of Insulating Systems of Electrical Equipment.

Publication 610: Principal Aspects of Functional Evaluation of Insulation Systems: Aging Mechanisms and Diagnostic Procedures.

Publication 611: Guide for the Preparation of Test Procedures for Evaluating the Thermal Endurance of Electrical Insulation Systems.

Basically, IEEE No. 1 is a most important document in preparation of standards dealing with electrical insulation and functional testing of insulation systems.

II. STANDARDS COORDINATING COMMITTEE NO. 4.1

(U.S. Technical Advisory Group for IEC5-63)

E. A. Boulter, Chairman
General Electric Company, Lynn, Massachusetts 01910 (26 members)

Secretary to be appointed.

This Committee has not met since my April 13, 1983 report to the Transformer Committee.

By correspondence, the Chairman reported to the U. S. National Committee of IEC the approval of Documents 63, 19, and 2011 Draft, "Performance evaluation of insulation systems based on service experience and functional tests." These documents had heavy input from U. S. members.

The next meeting of both Committees will be in Dallas, Texas on January 31, 1984 during the IEEE Winter Power Meeting.

THE INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.

MELVILLE - October 17, 1983

PLEASE REPLY TO

TO: IEEE Transformer Committee

SUBJECT: Disbanding of HVACC

The attached letter, dated May 9, 1983, by Mr. R. W. Seelbach, Chairman of HVACC, summarizes the activity of HVACC and includes his recommendation to the Electrical and Electronics Standards Management Board that HVACC be disbanded since its task was essentially completed.

At its meeting in June of this year, the EESMB voted to accept Mr. Seelbach's recommendation. Any remaining work on HVACC generated documents will be referred to the proper ANSI Standards Committee.

E. J. HUBER
HVACC Liaison

EJH:nr
LL MS13

american national standards institute, inc.

HIGH VOLTAGE APPARATUS COORDINATING COMMITTEE (HVACC)

(of the Electrical and Electronics Standards Management Board)

Chairman

Mr. R. W. Seelbach
Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062
(312-272-8800)

Administrative Secretaries

Mr. E. J. Huber
Underwriters Laboratories Inc.
1285 Walt Whitman Road
Melville, L.I., NY 11747
(516-271-6200)

Mr. J. D. Hopkins
National Electrical
Manufacturers Association
2101 L St. N.W.
Washington, DC 20037
(202-457-8400)

Subject 345

MELVILLE - May 9, 1983

TO: Members of HVACC, HVACC Subcommittees, and Working Group Chairmen

Gentlemen:

The High Voltage Apparatus Coordinating Committee of ANSI was established in July of 1973 by the Electric and Electronics Technical Advisory Board whose function has since been taken over by the Electrical and Electronics Standard Management Board.

The scope of HVACC is:

> "To review and evaluate existing ANSI and other related Standards for the purpose of developing a "Draft Standard" for unit substations and developing recommendations for:
>
> 1) Correlating the requirements of these Standards, and
>
> 2) Adding requirements to these Standards appropriate for product evaluation.
>
> The range of nominal primary voltages for unit substations to be considered is 601 V through 38 kV."

Since its formation, the work of HVACC, its subcommittees and its working groups has resulted in the preparation of 19 different documents as indicated in the following:

1 - Completion of "Draft American National Standard for 3-Phase Integral Unit Substations." This document, designated ANSI C37.120-198X, was issued for a one-year trial use period. The document has been forwarded to the newly formed Substation Subcommittee of the ANSI C-37 Switchgear Committee for final action.

2 - A companion document, developed jointly by HVACC and NEMA, "Proposed Requirements for 3-Phase Articulated Unit Substations," ANSI C37.121-198X, has been completed and forwarded to the Substation Subcommittee of the ANSI C37 switchgear committee for final action.

3 - Seven documents, covering transformers, switchgear and surge arresters, have been completed and published as new or revised American National Standards.

4 - Eight documents have been completed by HVACC and have been forwarded to the appropriate ANSI Standards Committees for ballot.

5 - One document on enclosure requirements has been completed and has been used as a source of material for other HVACC documents. It was not intended to be published as a separate Standard.

6 - One document on automatic reclosers received numerous negative votes that are not resolved. At present this document is dormant and is not considered to be essential.

Further details regarding the specifics of the status of the various documents are included in Section 8 of the 1982 HVACC Annual Report that was recently forwarded to you.

In view of the above, it is felt that HVACC has essentially completed its task and that it would be appropriate at this time for any remaining work on the involved documents to be handled within the framework of existing ANSI Standards Committees.

Unless comments are received to the contrary, it is planned to recommend to the EESMB that the High Voltage Apparatus Coordinating Committee be disbanded with the recommendation that any remaining work be referred to the proper ANSI Standards Committees.

The work that has been completed within HVACC is a tribute to all who devoted much time and effort to this work and it is gratefully acknowledged.

Very truly yours,

Robert W Seelbach

R. W. SEELBACH
Chairman - HVACC

RWS:dr
M4 F

THE INSTITUTE OF
ELECTRICAL AND
ELECTRONICS
ENGINEERS, INC.

MELVILLE - October 17, 1983

PLEASE REPLY TO:

TO: IEEE Transformer Committee

SUBJECT: 1984 National Electrical Code Liaison Report

The following material, taken from the "Analysis of the 1984 NEC" relates to changes made to Article 450 of the NEC. This information may be of interest to manufacturers and users of transformers.

Ciopies of this "Analysis" may be obtained from:

International Association of Electrical Inspectors
930 Busse Highway
Park Ridge, Illinois 60068

E. J. HUBER
NEC Liaison

EJH:nr
KK MS13

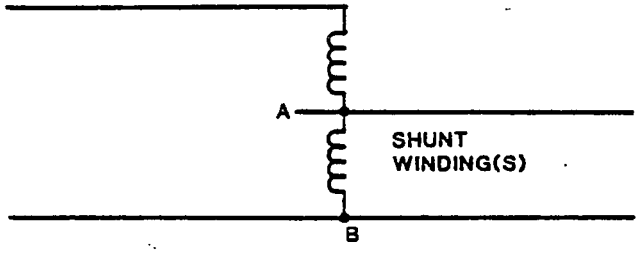
ARTICLE 450—Transformers And Transformer Vaults

450-3(c): Section 450-3(c) for the requirements for overcurrent protection of potential voltage transformers has been revised to accept a fine print note to see Section 384-22, which contains the protection requirements for instrument circuits.

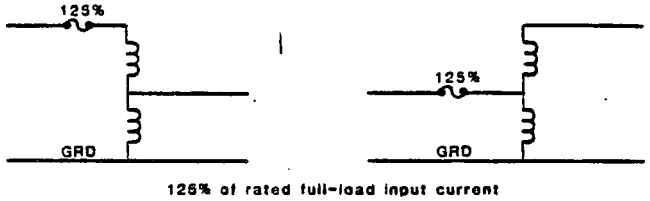
450-4: Section 450-4 is new and has been added to clarify the requirements for overcurrent protection of autotransformers and in particular prohibits the installation of an overcurrent device in series with the shunt winding

(the winding common to both the input and output circuits) of the autotransformer.

Diagram 450-4

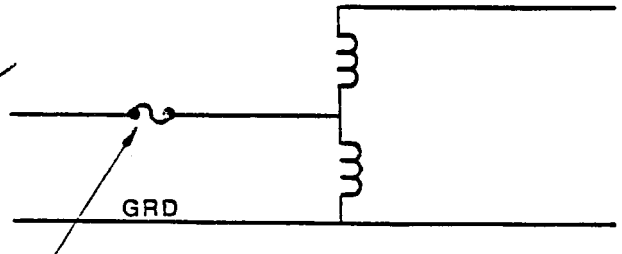


450-4
Autotransformer Overcurrent Protection



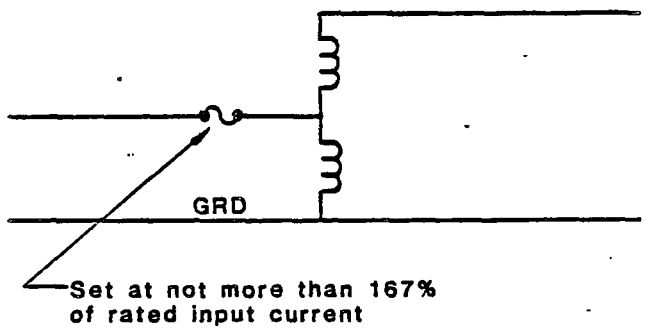
125% of rated full-load input current

450-4, Ex
Rated input current 9A or more



next higher rating where 125% does not correspond to standard rating

450-4, Ex
Rated input current less than 9A



450-23: Section 450-23 has been reidentified as "Less-Flammable Liquid-Insulated Transformers" consistent with the TIA that was issued by the NFPA Board of Directors on November 14, 1980. The existing Factory Mutual Research listing of insulating fluids relates to flammability characteristics such as fire point and heat release rates and to the use environment of transformers in noncombustible buildings and noncombustible occupancies and thereby assesses the total fire risk. These revisions clarify the use of the terminology "noncombustible" as related to building construction and materials, and to make the use of these terms consistent with NFPA 220-1979,—Types of Building Construction.

450-28: Section 450-28—Modification of Transformers is a new requirement in the code that calls for marking on a transformer to identify any field modifications and to assist in obtaining compliance with applicable requirements pertaining to the modified transformer. Most of these modifications involve the removal of Askarel and the installation of mineral oil or a high fire point liquid. The new 450-28 will require that when such modification is performed, the resulting installation will have the same degree of safety as if it were a new installation. As an example, it should prevent the replacement of Askarel with oil in an indoor installation without a vault.

REPORT OF ACTIVITIES IN CIGRE SC-12 TRANSFORMERS

(W. J. McNutt - U.S. Representative to CIGRE SC-12)

A transformer colloquium was held in Aachen, West Germany from September 19 to 23, 1983, including extensive discussion of the following subjects:

Transformer and Reactor Cores
Bushings and Connections
Thermal Aspects of Transformers
Activities of the Working Group on Response of Transformer Windings to System Transients

Some highlight items of interest to this committee are the following:

1. There was discussion of core loss decrease with increasing temperature and the consensus position was that the loss should be measured with the transformer oil at a temperature of 25°C, with no correction. A representative of Nippon Steel Co. showed many curves of loss change with temperature for various grades of steel. Changing from 25°C to 85°C invariably resulted in about a 4% loss decrease.
2. It was pointed out that standard thermal tests for a bushing consider only I^2R losses, but for EHV or UHV bushings the dielectric losses can be as large or larger. These additional losses should be considered in the thermal design.
3. There was considerable discussion of gas-in-oil analysis for bushings. The general consensus was that it is too risky to do on a routine basis (because the removed oil must be replaced), but that it should be done for diagnostic purposes on any suspect bushings.
4. Reports were given on the application of devices for direct measurement of winding hot-spot temperature in production transformers in Great Britain, Sweden, Japan, and the United States. The majority of the applications used fiber optic sensors buried in the windings.
5. Discussion of diagnostics from gas-in-oil analysis following conventional heat runs suggested that overheated cellulose would have to exceed a temperature of 200°C in order to be detected. Hot bare metal in oil would have to exceed a temperature of 300°C to be detected. This is a consequence of the rate of gas evolution and the duration of the heat run test.
6. Four examples of internal transformer dielectric problems following system switching or fault events were detailed from Belgium, Great Britain, West Germany, and Hungary. All transformers had a large tap range and the internal failures were between bare parts in the tap changer. These are very parallel cases to the "Resonant Overvoltage" failures under discussion in our committee for many years.
7. The Working Group on Response of Transformer Windings to System Transients will present a paper summarizing status of their activities at the 1984 CIGRE General Session.
8. A Working Group will be set up within CIGRE SC-12 on determination of winding hot-spot temperature, by both analysis and measurement.

IEEE JOINT COMMITTEE ON NUCLEAR POWER STATIONS

The IEEE/NPEC/SC-2 met on September 21 and 22, 1983.

1. The IEEE Standard 323 has been approved by the Standards Board on May 23, 1983. It was tentatively released in the early part of October. To my knowledge copies have not yet been distributed.

   The new standard has introduced a difinition for "mild environment". If equipment is located in a mild environment, only seismic conditions need to be addressed. Radiation would no longer be applicable.

2. The tentative date for the next NPEC/SC-2 meeting is November 16, 17 and 18, 1983, in Orlando, Florida.

LAISON REPORT
ON
SOCIAL IMPLICATIONS OF TECHNOLOGY SOCIETY

D. A. YANNUCCI

The Social Implications of Technology Society has added a fifth chapter, the latest organized in Pittsburgh, Pennsylvania.

The Social Implications of Power Technology Committee was scheduled to meet on July 18, 1983 at the 1983 Summer Meeting. This meeting was cancelled due to the inability of the chairman, Mr. Underwood of Long Island Lighting, to attend.

The committee has made progress in developing a session for the 1984 Winter Meeting on physiological effects of electrical shocks and electric body impedance, to be moderated by D. Mukhedkar, Ecole Polytechnique, Montreal, with panel members J. E. Bridges, IIT Research Institute, Chicago, A. Sances, Medical College of Wisconsin, Milwaukee, and L. A. Geddes, Purdue University. This session will be co-sponsored by The Power Engineering Society, Power System Instrumentation and Measurements Committee, Substations Committee and Electrical Safety Committee of SSIT. It will be on Monday, January 31 at 9:00 a.m.

A proposed session on Better Lifelong Utilization of Engineers will be delayed pending revision of a proposed questionnaire to be used to survey the PES membership.

The PES Technical Council is also in the process of assessing the IEEE Technical State of the Art. One of the problems that the Technical Council continually faces is trying to decide how to handle the technical discipline when technological concepts crosses several technical committee scopes.

The Social Implications Committee is soliciting any printed papers or articles that could be offered in the IEEE Technology and Society Magazine. The articles may have been printed elsewhere, but would represent the Power Engineering Society on social implication issues.

The next meeting is scheduled for January 30, 1984 at 9:00 A.M. at the Winter Power Meeting.