

**Distribution Subcommittee
IEEE Winter Power Meeting Minutes
January 29, 2003**

ADMINISTRATIVE

Chair Dan Ward called the IEEE Distribution Subcommittee meeting to order.

CHAIR REPORT – Dan Ward, *Distribution Subcommittee*

The distribution subcommittee has gone through a dramatic series of changes in the last year or so – some because of our own doing and some because of forces beyond our control. Nonetheless, I believe we've emerged as a stronger, more focused group providing greater value to distribution engineers.

I'm encouraged by the new groups that we've introduced. They reflect some of the new directions the industry is taking or they represent core issues that we failed to address in the past. No organization is perfect and we need more input from members along the lines of what you see as important needs for our groups to be working on.

I'd like to target organizations like EEI and regional groups to send people to our meetings. If you have some contacts with outside organizations, let me know and we'll try sending flyers or emails that highlight our groups and their current activities.

VICE CHAIR REPORT – John McDaniel, *Distribution Subcommittee*

John McDaniel has replaced Dan Sabin as Vice Chair of the Distribution Subcommittee. We thank Dan for all the good work he did while Vice Chair, and we welcome John.

T&D ADCOM Meeting

Following are some of the highlights from the January 30, 2003 T&D ADCOM meeting. For a copy of the minutes, contact the Administrative Committee via e-mail.

- **Las Vegas Meeting** - There were approximately 380 people registered for the conference. There were also approximately 75 companions present. The cost of the conference was \$80,000. IEEE paid \$15,000 for the reception. It appears the registration fees covered the cost of the conference. Final figures were not available at the time of the ADCOM meeting.

The floor was open to a general discussion of the Las Vegas Winter Technical Meeting. The overall opinion of the meeting was excellent. All supported making it an annual conference sponsored by the T&D committee. It was also suggested the Substation Committee be invited to co-sponsor the meeting and keeping it a technical meeting without paper or panel sessions, but allowing technical presentations to be made in the subcommittees and Working Group meetings. This would allow the membership to concentrate on the Working Groups.

As previously stated, everyone was supportive of continuing the Winter Technical Meeting. The IEEE Meeting Planner (Vita Feuerstein) will be hired to plan future meetings. It was decided to plan both the 2004 and the 2005 meeting. Las Vegas was a great conference city and would be fine for a second conference. However, it may be better to skip a year to allow Vita more negotiating time for better facilities. Since so many delegates were unhappy with the sleeping rooms, it was decided to allow Vita to raise the room cost to the \$120 to \$150/night range. A discussion followed to select some cities for the Technical Meeting. They must be in a warm area, easily accessible from both coasts, and cost effective (i.e. cheap). A short list was developed: San Antonio, TX; Las Vegas, NV (but not the Riviera); New Orleans, LA; San Diego, CA; Orlando, FL.

- **Awards** - Dick Piwko reported on the awards luncheon held on January 29, 2003. The following were presented: Distinguished Service Award; Working Group Recognition Award; Prize Paper Award; T&D Committee Service Awards and Certificates of Appreciation. Dick has agreed to continue as the Chairman of the Awards Luncheon.
- **T&D Committee Operations and Procedures:** Every technical committee has to have a manual. One has been put together for the T&D Committee and it is in committee for voting. Once it is approved it will be e-mailed to ADCOM members.

WORKING GROUP REPORTS

SYSTEM DESIGN – Cheri Warren, Chair

53 members and guest attended the meeting that began at 8 AM. John McDaniel (mcdanielj@dteenergy.com) who is serving as secretary for the group recorded the minutes. Note: A copy of the presentations will be placed on the groups' web site: <http://grouper.ieee.org/groups/td/dist/sd/> Excerpts from the meeting notes follow. For the complete text, see the web site.

Task Force on Reliability Indices

The meeting started out with Jim Bouford updating the group on how the Major Event Definition came into existence. Charlie Williams, Jim Bouford, Rich Christie, Dave Schepers, John McDaniel, Joe Viglietta, Dan Kowalewski Rodney Robinson, and Cheri Warren worked diligently to analyze member data and develop the methodology. Other WG members tested data and helped to resolve issues.

The whole issue started out as a “Major Storm” definition. There was a need to develop a better definition. A method was presented that used Customer Minutes Interrupted (CMI)/Day to evaluate major storms and this approach appeared to be useful, but differing size utilities posed a problem. To mitigate the size issue and to consider mergers that change the total customers served, the group moved to using SAIDI per day as the metric. Rich Christie performed a significant amount of work to provide the statistical basis for the definition. In the process, we reaffirmed that outages are not distributed on a bell-shaped curve (do not follow a Gaussian

distribution), but they appear to be best represented by the Log-normal distribution. Their distribution does not exactly match the log-normal distribution, but it closely approximates reality. Hence that approach was used to further the major event definition. There was also a need to move away from identifying major storms (as the events of 9/11 showed). The group then settled upon the use of Major Event Days (MED) to segment the reliability data of utilities. A good indication of baseline reliability can be seen when MED's are removed from the data set. One of the main goals is to reduce variability caused by Major Events to allow for trending and goal setting based on utility performance.

When an MED occurs, the utility's design and/or the operational limits are exceeded. The group believes that these events should be separately analyzed and reported. MED's are for classifying or segmenting data, **not excluding** (i.e., how did you respond to the MED – not is the design or operation adequate because we don't design or staff for major events – it would be cost prohibitive to do so). As the outage data is not Gaussian, but more closely approximates the lognormal distribution, α and β were used in the definition as opposed to μ (μ) and σ (σ). We have developed a heuristic model, formulated from a theoretical basis, modified to provide real world results. We are using a lognormal ESTIMATION of the data, since that seems to provide the best chance of reasonable results (the data is not lognormal).

From a strictly theoretical perspective, the Lognormal of SAIDI can cause a problem when the daily SAIDI is zero. When SAIDI is zero, the Ln is $-\infty$, which cannot be evaluated. Based upon theoretical concepts for handling zeros in the data, the minimum value for SAIDI/Day was substituted for zero values. This has caused “non-rational” results for at least one utility.

Cheri informed the group that the document had received a favorable review from IEEE Standards Association. After the minor edits are made, the Guide will go out for ballot.

The Working Group paper, “*Classification of Major Event Days*” was submitted and accepted for presentation at the IEEE/PES 2003 General Meeting in Toronto.

The recent email survey on momentaries (fuse blow or fuse saving practices) received a huge response. Over eight (8) pages of responses were received and sent back out to the group. The group should put together a paper on the results. Some members suggested that we further explore the affects that different fuse saving (or fuse blow) practices have on reliability indices. It was suggested that this group could send out survey questions every so often (about every 6 months) and publish findings. The next step would be to collect a list of questions. Rodney Robinson brought up that EEI is always willing to send out surveys, which may be one possible route.

There were then several presentations made.

Major Event Classification of Catastrophic Events

The first was: “*Major Event Classification – Adjustment to the 2.5 Beta Method*” by Majella Lafontaine of Hydro Quebec. Please see the web site for a copy of the presentation. It dealt with

the 1998 Ice Storm (which was at least a 1 in 100 year event) and its impacts on the 2.5 β Method. Their proposed adjustment would be to segment any daily SAIDI days that were over 4 β when determining the major event day threshold (TMED). A comparison of MED's was shown with and without this proposed adjustment.

Adjustment to the Major Event Day Definition to Address Storms that Span Multiple Days

The next presentation was by Dennis Hansen and Heidi Caswell of PacifiCorp. Their presentation was on multiple days within a Major Event. The old methodology allowed for multiple days within an event. With the new 2.5 β method, only those days above the threshold are MED's. They showed data from several storms, in particular the Thanksgiving 2001 Utah storm (they called it the "broken tooth" storm due to the daily SAIDI plot). During this storm, the first, third and fourth days were above the threshold, but the second day was not. Even though the second day was not classified as a MED, the system is still undergoing exceptional stress and the utility is still in an emergency mode.

The group pointed out that this situation was one Major Event with 3 MED's. The commission will still be looking at all of the days within the event. But, the reliability statistics will be adjusted for the MED's. Reporting for this event to the commission and executives should be for the entire event. Ultimately, it is up to each state's commission as to what is included in the Major Event.

The following proposed language was accepted by the group (30 for, 3 against with some abstentions) for the Major Event definition:

Major Event. Designates an event that exceeds reasonable design and or operational limits of the electric power system. A Major Event includes at least one Major Event Day (MED).

Zero SAIDI Days

There was then a discussion on what to do with days that have no interruptions (0 SAIDI). One smaller utility had 110 days of 0 SAIDI over the past 5 years. By replacing the 0 SAIDI days with the smallest non-zero value skewed their results (MED's). This seems to impact smaller utilities more than larger ones (it would also impact regional analysis within larger utilities). With most utilities, there is little or no difference in the SAIFI or CAIDI using the 2.5 β method when either the zero SAIDI's are ignored or replaced with the lowest non-zero SAIDI.

After this discussion, the groups decided to change the wording on item 2 under Section 4.4 to:

Only those days that record a SAIDI/Day value will be used to calculate the Tmed.

The group will continue its research on this issue, but allow the guide to be balloted in its present format. A comment will be added to the introduction.

Possible new Task Force on Reliability Regulation

Larry Conrad (Cinergy Corp.) inquired about the regulatory use of the Guide (1366). An e-mail inquiry was sent out on Friday, January 24, 2003. Some points were:

- Summarize/track regulatory use of 1366

- Exchange information, with a possible survey
- Better understanding of future needs
- Help improve Guide (1366) for users
- Promote a better understanding within the state commissions

There is a lot of regulatory interest in the Guide. In at least one state, each feeder (or circuit) has to meet reliability targets. There is a need to satisfy commissions, but the need is to ultimately improve the customer's reliability. Overall, there are a lot of different users of 1366. With all of this interest, the question was raised does the group wants to form another Task Force to follow this.

The National Regulatory Research Institute (NRRI), the research arm of NARUC, has an online survey which can be found at: (<http://www.nrri.ohio-state.edu/programs/reliability.html>)

CEA (Canadian Electric Association) is starting their annual survey, which has been in existence for over 40 years. They are looking for participants. The cost per utility is around \$1,000. This is an open survey, so everyone knows what everyone else's responses were. CEA's contact is Peter Gelineau [gelineau@canelect.ca]

At this point, the Task Force on Reliability Indices meeting was adjourned.

Task Force on Reporting Practices

This meeting was co-chaired by Ken Lau (PG&E)(substituting for Dan Pearson) and Don Hall (CES). Ken made a presentation: "*Outage Reporting Guide*". This was an update to Dan Pearson's "*Outage Reporting Hierarchy*" which was presented at the 2002 Summer Meeting. Emails should be sent to Don Hall (don.hall@ces.com) or Ken Lau (kcl4@pge.com) if anyone is interested. From this presentation the group was asked, "do we want to create a new Guide or include this in the next version of 1366?" This will help with benchmarking. CEA's survey has 10 or 11 broad categories were each participant is to place all of their outages. This Guide could help develop a standard OMS product.

It was decide a scope document should be developed. Clay Doyle had volunteered to help out with this at the last meeting. It was decided that the Task Force's recent IEEE paper would be another good starting point. It was also pointed out that EEI is willing to work with IEEE on this matter.

Task Force on Reliable Design

Jim Bouford reported on two (2) other meetings that he had attended. The first was on the 1159 meeting. Jim got that group to place a footnote in 1159 that the definitions for momentary and sustained outages in 1159 referred to Power Quality and that Reliability had their own definitions. The second meeting was from the Lightning and Insulator Subcommittee's Task Force on Bird Related outages. Jim related to this group that there is a group that deals with reliability and these two groups should coordinate efforts. This Task Force has been meeting for some time and they are close to some form of document.

This group has planned on sponsoring a panel session at the IEEE/PES T&D Conference in Dallas. None of the volunteers from the previous meeting were present. If this panel does go forward, panel papers are due (upload electronically) by March 3, 2003 to IEEE.

Other Business

There are 2 other Reliability Panels that are planned for the T&D Conference. They are: Distribution Reliability Standards and their Basis, chaired by Mani Venkata; experiences in Comparing Reliability Indices Collected before and after OMS Implementations, chaired by Hahn Tran

SWITCHING AND OVERCURRENT PROTECTION – Betty Tobin - Chair

The Working Group on Switching and Overcurrent met on Tuesday, January 28, 2003 from 8AM to 11:30AM. Minutes from the last meeting were read and approved.

The Working Group decided investigate the issue of fusing guidelines for distribution transformers. John Banting will look for information already available on this topic. We reviewed the notes from the ICC Fault Indicator Meeting. There may be a private site for drafts of the Application Guide, and we should be able to access that site.

The Task Force on Distribution Networks reviewed portions of the Network Tutorial. We decided that Chapter 13 still needed revisions. Bill Feero had no further comments for Chapter 11. We agreed that photo credits should be acknowledged in the Tutorial. We also decided that we should state in the Introduction that this Tutorial is not covering the issues of Distributed Generation in networks, and also reference that fact in the calculation section of Chapter 13. We will complete all changes and get them to Ray Capra for final review and for references. Betty Tobin will have Appendices 1 and 2 put into the IEEE format and will try to find Figures for the cable appendices. We will determine how long it will take to publish the Tutorial and then when it should be scheduled.

Bill Feero reported that P1547, the Standard for Interconnecting Distributed Resources (DR) to the Electrical Power System, is close to being approved. The State of Massachusetts is preparing interconnection guidelines for DR to the distribution system, including secondary networks, grid and spot.

Reigh Walling's Working Group on Distribution Generation Integration will be taking out a PAR for IEEE work on the grid impact of DR.

Distribution Automation – Anil Pahwa - Chair

The Working Group on Distribution Automation did not meet.

Distribution International Practices – Antone Bonner - Chair

The Working Group on Distribution International Practices discussed distribution practices in Russia. They also are considering future panel sessions.

Distribution Maintenance Planning – Dave Gilmer - Chair

A roundtable discussion of the Working Group's possible activities was held. There was continued general agreement that the topic is timely.

Developing a Guide or Recommended Practice for maintenance of all or part of the distribution system will be difficult. The subject is highly political in that, unlike capital expenditures which can be recovered in rates, maintenance expenditures flow directly to a utility's financial bottom line. They always must be justified to management, usually must be explained to regulators, and may have to be explained to customers. It is entirely possible that none of these three groups will possess any significant knowledge of distribution systems.

The breadth of the subject suggests confining initial WG activities to a subset of the distribution system, and initial concentration on overhead distribution was reaffirmed. Others within the T&D Committee family have already done work on some topics, such as wood pole inspection and tree trimming. Duplications and conflicts must be avoided, so perhaps the first emphasis should be on "things that hang on poles".

The suggestion was made that a panel session or a tutorial might be a more appropriate initial activity for the WG. Some type of panel session is being considered. A tutorial oriented toward utility managers lacking any distribution experience was also discussed. Tentative planning has begun for presentation of a tutorial at a PES Annual Meeting or T&D Conference and Exposition in 2004 or later. Such a tutorial would attempt to cover both overhead and underground systems.

Just to get something down on paper, Lee Welch of Georgia Power volunteered to draft a scope for a possible Recommended Practice for Maintenance of Overhead Distribution Systems. Dave Gilmer will rework some existing material and will also finish a section on fuse cutouts. Greg Ardrey of Alliant Energy volunteered to do a similar draft on oil circuit reclosers. These drafts will follow the driver, component, activity, benefit format established in earlier meetings. The deadline for these drafts to be submitted to the Chair is March 1, 2003.

Distributed Resources Integration – Reigh Walling - Chair

Reigh Walling provided an update on IEEE P1547. He attended the meeting Jan. 23 and 24. P1547 is now in ballot resolution. It will be re-circulated for re-ballot with negative comments included with the re-circulation. The following additional standards will be developed: 1547.1 test standard, how to perform testing; 1547.2 application guide for 1547, 1547.3 develop communication protocol/standard. Also 1547 will in future have docs for secondary networks and requirements for system impact studies.

Reigh Walling provided an update on *T&D General Systems*, Working Group on Distributed Resources – Modeling and Analysis. This group developed a scope for the application of modeling task. Originally there was some overlap with DRI, but that has been addressed.

Request for WG meeting presentations: Interested parties are to contact Reigh Walling by email. Bill Feero suggested having a joint WG session with Secondary Networks Task Force to present some information on a DG on a secondary network.

Start planning panel session for Summer 2004 PES. Before Toronto meeting interested parties should get information to Reigh about ideas for topics/papers. Larry Morgan suggested a panel on the cost of impacts on distribution equipment. The group pointed out that we need to include some discussion of benefits (real \$) as well. The ultimate goal is to get the resulting information published, perhaps in Spectrum and other trade magazines. Bill Feero suggested that panel papers be circulated to panel members so that they may comment on the papers (at the end of each paper).

The following people volunteered: Larry Morgan volunteered for relay re-coordination; John Bazura, National Grid; Roger Dugan on rate impacts; Manuel Gonzales for operations costs/operating practices.

Larry will present an overview of the FERC and OPER requirements for DG at the next WG meeting.

Take on making a Trial Use Guide, Reigh will check with the Standards Coordinating Committee to find out if it can move from Trial Use to Recommended Practice. Target to get scope ready at Toronto and have PAR ready for winter 2004 meeting.

Working group report. Bill Feero will write a section on low voltage breakers. Ken Lau will write a paragraph on faulted circuit indicators. Manuel Gonzalez will write a few paragraphs on operations. Charles Perry will send something on PQ (flicker, harmonics, etc). Tom Short will add some input on impacts on reliability for the paper.

Paper will use the term “DG” throughout. Betty Tobin suggested that everyone look at their sections and keep in mind that the “grid” can include the secondary of the transformer if the transformer serves more than one customer. It was noted that C37.108, a standard on network transformers, mentions DG.

Electrical Testing of Wildlife Protectors– Mike Lynch - Chair

This Group is expecting to receive a PAR soon.

Distribution System Performance – Scott Peele – Chair

The Group is working on a white paper on distribution circuit performance analysis techniques. The PAR is expected in March 2003.

NEW IEEE POWER QUALITY SUBCOMMITTEE AND WORKING GROUPS

The new Power Quality Subcommittee is chaired by Tom Gentile. The Vice Chair is Mark Halpin and Dan Sabin is the Secretary and Webmaster (<http://grouper.ieee.org/groups/td/pq/>)– Russ Ehrlich is the Secretary. For meeting notes, see the website.

The PQ Subcommittee includes the following working groups

- Working Group on Harmonics (IEEE Std 519)
- Working Group on Voltage Quality (IEEE Std 1250)
- Working Group on Monitoring Electric Power Quality (IEEE Std 1159)
- Working Group on Recommended Practice for Evaluating Electric Power System
- Compatibility with Electronic Process Equipment (IEEE Std 1346)
- Working Group on International Conference on Harmonics and Quality of Power (ICHQP)

The Custom Power task Force, presently part of the Working Group on Voltage Quality, has proposed that the task force become a working group under the Power Quality Subcommittee. This would then become a Power Quality Solutions Working Group. This working group would try and encompass solution for voltage sags, momentary interruptions, and harmonics. The new Working Group would have Task forces of Medium Voltage, Low Voltage, and P1346 (economics) update. We should also inform IAS of the proposals of the tasks forces and request possible joint sponsor in this working group. The chair and Dan called attention to the nomination of Neil Woodley for the Custom Power Award. Ambra, Mark, Ram, and Dan agreed to write letters for Neil's nomination of this award.

LIAISON REPORTS

Insulated Conductors

The ICC is writing a document on the detection and mitigation of neutral corrosion on power cable.

Power System Relaying

No Report

Surge Protective Devices

C62-11 is being revised, with balloting expected in one year. The PAR for C62-22 is being extended. The section on T&D line protection is being separated out.

Switchgear

There are major changes in relationships among NEMA, IEEE and ANSI. NEMA has released its copyrights to IEEE/ANSI and they will assume the work NEMA has done not only for switchgear, but also for transformers and other electrical equipment.

Transformers

No Report

SCC 21

No Report

STANDARDS ACTIVITIES

ANSI C84.1

No Report.

NESC

The recent edition of NESC will be in effect until February 2007. Proposals for changes to the next edition must be in by July 2003.

Presentations

IEEE Standards – Naeem Ahmad

The process and policies for Standards development are pretty much the same, but there are some changes in how you provide the documents. Carl Mortenson is the sponsor for T&D ballots (not the Working Group Chairs). Balloting groups must have representatives from manufacturers, and users. Any one group can not exceed 50% of the total members voting on a standard. There is now a generic balloting letter, but specific information can be inserted.

DSTAR Cable Ampacity Testing – Reigh Walling, General Electric

Results of cable ampacity testing done at a test site were presented. Factors taken into consideration included duct configuration and soil conditions.

Intelligent Applications for Substation Monitoring – Mark McGranaghan, Electrotek Concepts

The presentation detailed the benefits of using equipment installed at the substation to identify distribution system problems and even detect incipient system faults. Applications included fault location, capacitor operations, transformer evaluations, power factor control and harmonic resonance identification and control. More information can be found at the websites: www.powermonitoring.com/substation.htm; www.signaturesystem.com; and www.pqview.com.

Appendix 1: Attendance List

The following tables list the attendees of the IEEE Distribution Subcommittee meeting on January 29, 2003.

Table 1: IEEE Distribution Subcommittee Members

Name	Company
Greg Ardrey	Alliant Energy
John Banting	Cooper Power Systems
Phillip Barker	EPRI PEAC
Antone Bonner	Cooper Power Systems
Jim Bouford	National Grid
Ray Capra	Consultant
Jim Cheney	Arizona Public Service
Chuck DeNardo	Wisconsin Electric/Gas
John Goodfellow	ECI
Dick Hensel	Consumer Energy M-462
Mike Lynch	
John McDaniel	Detroit Edison Company
Scott Peele	Progress Energy
Daniel Sabin	Electrotek Concepts, Inc.
Tom Short	EPRI PEAC
Elisabeth Tobin	Seattle City Light
Reigh Walling	GE Power Systems
Cheri Warren	National Grid
Charlie Williams	Florida Power

TOTAL 19

Table 2: Guests

Naeem Ahmad	IEEE Standards
John Ainscough	Excel Energy
Fayyaz Akram	Power Tek Global
Ruben Burch	Alabama Power
Keith Frost	Com Ed
Donald Hall	CES International
Dennis Hansen	PacifiCorp
Gene Lindholm	Cilco
Mark McGranahgan	Electrotek Concepts, Inc.
Jerry Murray	Oregon PUC
Bob Saint	NRECA
Joe Viglietta	Exelon PECO
Lee Welch	Georgia Power Company

TOTAL 13

Appendix 2: Panel Session Requests

There were no Panel Session Requests for the Summer Power Meeting.

Appendix 3: Current Membership Roster

Chair: Ward, D., Richmond, VA

Vice Chair: McDaniel, J., Belleville, MI

Secretary: Tobin, E., Seattle, WA

Ardrey, G., Beloit, WI
Banting, J., Pewaukee, WI
Barker, P., Schenectady, NY
Bonner, A., Franksville, WI
Bouford, J., Northborough, MA
Burke, J., Cary, NC
Capra, R., Lafayette, CA
Chebli, R., New York, NY
Clinard, K., Sammamish, WA
Conrad, L., Plainsfield, IN
DeNardo, C., Milwaukee, WI
Ehrlich, R., Kennett SQ, PA
El-Keib, A., Tuscaloosa, AL
Fijnvandraat, C., Andover, MA
Gentile, T., Westborough, MA
Gilmer, D., Craig, CO
Grainger, J., Raleigh, NC
Hensel, D., Jackson, MI
Horman, D., Salt Lake City, UT
Juj, H., Seattle, WA
Landman, B., North Hampton, NH
Lynch, M.,

Makal, J., Pewaukee, WI
Mancao, R., Lusby, MD
McDermott, T., Jefferson Hills, PA
Mejdrich, R., Citrus Heights, CA
Oedemann, R., Philadelphia, PA
Pahwa, A., Manhattan, KS
Pearson, D., San Francisco, CA
Peele, S., Raleigh, NC
Redman, J., West Orange, NJ
Russo, D., Seattle, WA
Sabin, D., Knoxville, TN
Sheehan, M., WA
Short, T., Schenectady, NY
Smith, D., Wilmerding, PA
Stepniak, F., Hackettstown, NJ
Tengdin, J., San Clemente, CA
Vogel, S., New York, NY
Vollkommer, H., Columbus, OH
Walling, R., Schenectady, NY
Warren, C., Albany, NY
Welch, G., Raleigh, NC
Williams, C., Maitland, FL

Appendix 4:

The following are logistical notes from the meeting:

The Task Force on Distribution Networks may become a Working Group chaired by Betty Tobin. A volunteer would then be needed to chair the Working Group on Switching and Overcurrent.

The Working Group on System Design continues to need a room large enough to hold at least 50 people.