

**IEEE Distribution Subcommittee  
Meeting Minutes  
January 12 2011  
Atlanta, GA**

The meeting convened at 1:00 p.m. with 25 members and 3 guests present.

**ADMINISTRATIVE**

Vice Chair John McDaniel called the IEEE Distribution Subcommittee meeting to order. The notes from our July 2010 meeting were approved.

**CHAIR REPORT – Cheri Warren, *Distribution Subcommittee***

No Chair Report was available.

**VICE CHAIR REPORT – John McDaniel, *Distribution Subcommittee***

Between July 2010 and January 2011, the subcommittee has been assigned a total of 17 transactions grade papers and 1 PES Letter to review. Of these, 10 were new papers and 7 were revisions. This is down significantly over the same period last year. The web site for the process is located at: <http://mc.manuscriptcentral.com/tpwr-d-pes> .

Next week there is the ISGT Conference. This Smart Grid conference is being held in Anaheim, CA. Cheri and I have tried to get the JTCM and the ISGT to meet concurrently, but without any success. As some of our groups are involved with Smart Grid, it makes sense that they should meet in the same location.

**WORKING GROUP REPORTS**

***DISTRIBUTION RELIABILITY – Cheri Warren, Chair***

John McDaniel, vice-chair, called the working group meeting to order at 8:00 a.m. Chair and Secretary both could not attend due to the snow event in Atlanta. There were 38 attendees. The draft minutes from the 2010 General Meeting were approved.

**TF on Reliability Indices P1366 – Vice-Chair John McDaniel, National Grid**

The TF has received several proposed changes to IEEE 1366-2003 definitions. The TF decided that the definitions had been discussed thoroughly at past meetings and there was no need to revisit them.

John McDaniel made a short presentation on the definitions for CELID (customers experiencing long interruption durations). Two different CELID's were presented: one for a single interruption and one for total interruption duration. During the meeting, two separate ways of presenting the expressions were shown (after the meeting, a third way was sent via Val Werner. This presents the indices as CELID-T and CELID-S). These two definitions will appear in the next draft of 1366.

**TF on Catastrophic Days** – Chair Heide Caswell, Pacific Power

The Catastrophic Days TF presented their final analysis and recommendations. Three approaches for catastrophic event determination were considered - the Robust analysis, the Bouford (4.15  $\beta$ ) approach and the Box & Whiskers method. Only the Bouford and Box & Whiskers were analyzed, in part the TF wanted to keep the method reasonably simple, in part so that it could be explained to regulators.

Results for several utilities were shown that compared the Bouford (4.15  $\beta$ ) method, the Box & Whiskers Method and just utilizing MED's. From the comparisons, neither method consistently identified what would be considered catastrophic events. They either predicted too many events or no events at all. In the end, the difference in normalized SAIDI was not too different. With that, the TF did not recommend adding Catastrophic Events to 1366.

U47 stated that they were first in favor of adding Catastrophic Events. But they never considered that they had one, even with one event where 60% of their customers were interrupted. They had almost all of the customers restored within 2 days. They did state if the group ever added a definition for Catastrophic Events, then SAIFI/SAIDI should be reported with an "\*" (One "\*" for each event).

Additionally, it was recommended that the methodology for evaluating Catastrophic Events be captured in a white paper, which could be subsequently presented at an appropriate meeting.

**2010 Benchmarking** – Heide Caswell, Pacific Power

Heide Caswell presented an overview of the Benchmarking process. Starting in 2009, utilities filled in a workbook that was set-up for the process. In addition to filling in the data, the companies can run macros which display their results. This helps facilitate and speed up the benchmarking process. The macros that Heide and her staff have created automatically deal with the 'zero days' and update the regional color coding in the results charts.

For 2010, the proposed schedule is as follows: Request will be sent out in late January/early February. Data is due back to Heide by April 1 (no fooling). A Sub-team will analyze the preliminary results in May and make recommendations. The final results are to be presented at the 2011 GM in Detroit.

Alex Hofmann stated that APPA runs a similar study to the IEEE Benchmarking. APPA is looking at incorporating 1366 into this study and creating an operational tool from it. APPA may be willing to work with our benchmarking.

**Value of Service Calculator** – Heide Caswell

Heide gave a short summary of Joe Eto's "Value of Service Calculator". A formal presentation was made to the WG at the 2010 GM.

John Goodfellow suggested that if the Value of Service Calculator becomes a tool that the WG might want to write a rebuttal or position paper on it. A chief concern amongst the membership is how the benefit of reliability projects becomes characterized and the extent to which it becomes the metric of choice for making improvement decisions.

***SWITCHING AND OVERCURRENT PROTECTION – Lee Taylor, Chair***

Lee Taylor started the meeting with a safety discussion including the location of fire exists and defibrillators. The IEEE required slides for working Groups were presented: <http://standards.ieee.org/borad/pat/pat-slideset.pdf> The Minneapolis July 27<sup>th</sup> meeting minutes were circulated among the members for comments and correction. The minutes were approved at end of the meeting.

Lee Taylor discussed the scope of the proposed P-1806 Guide about placement of OH/UG switching and protective equipment and members recommended adding “Medium Voltage (MV)” to the scope. The TF will be looking at available software for protection device placements and expects to have a non commercial software program presentation in future. He also discussed having members actively engaged and interested during the process of writing the Guide. The concept of using Customer and Customer Mile Interruption (CI&CMI) as part of the process for determining equipment placement was discussed.

***SMART DISTRIBUTION – Georges Simard, Chair***

There were about 40 attendess at this meeting.

For the IEEE / PES 2011 General Meeting, Detroit, Michigan, July 24-28, 2011:

1. Three panel sessions will be sponsored by the SDWG
  1. Smart Distribution Grid Applications and Components; Chair: GLClark,
  2. Smart Distribution Demonstration Projects: Chair: Georges Simard, possibility of a combo session with the SDWG meeting
  3. Integration of Distributed Energy Resources (DER): Chair: Avnaesh Jayantilal
2. The Smart Distribution tutorial given at the Minneapolis GM will be offered at Detroit.

The WG has a roundtable discussioin on Smart Distribution projects to exchange and prepare future panel sesions. A summary of these projects will be written down by the SDWG officers. After validation of the content by the members this summary will be posted on the SDWG Website <http://grouper.ieee.org/groups/td/dist/da/>

There is a Smart grid clearing house website <http://www.sgiclearinghouse.org/ProjectMap>.

**Volt/Var Task Force**

The TF met at 10AM following the SDWG meeting and had about 35-40 attendees. This was our third meeting; we previously met at the JTCM in 2010 in Orlando and at the IEEE PEGM in

Minneapolis in 2010. Minutes from the last meeting in Minneapolis were shown and approved by the task force.

The TF revisited the VVTF challenges, vision, scope and rationale for formation of the task force and officers and thoughts on deliverables; past panel session and one coming up for Detroit. Related presentations are posted on the website along with the meeting minutes.

The first deliverable has been a panel session at the Minneapolis 2010 PESGM titled “Volt/Var Control: Present & Future” during at which time we had four presentations. Next deliverable is a panel session for the 2011 PESGM titled “Integration of Smart Grid Technology into Volt/Var Optimization”; we have three presentations lined up for it.

The second hour was spent discussing volt/var control and CVR projects, ideas and thoughts in a roundtable/room discussion. The TF will be putting together possible white paper topics/outline and find volunteers to write more specific outlines and start working on a white paper or papers.

***DISTRIBUTED RESOURCES INTEGRATION – Bob Saint, Chair***

The Working Group met on Monday January 10 at 8 AM, with 26 attendees. We reviewed status of IEEE 1547 Series of standards, discussed Draft 4.0 of IEEE P1547.7 (Planning Studies) and discussed Resource Document version 1 of IEEE 1547.8 (Extension of IEEE 1547).

The next meeting will be a “Combo” Session at PES General Meeting in Detroit. Tom Rizy will present official paper and two others are invited to give unofficial presentations.

***LIGHTNING PERFORMANCE OF DISTRIBUTION LINES – John McDaniel, Chair***

No report is available.

***VOLTAGES IN PRIVATELY AND PUBLICLY ACCESSIBLE LOCATIONS – Chuck DeNardo, Chair***

The Working Group on Voltages at Publicly and Privately Accessible Locations (aka the Stray & Contact Voltage Working Group) met at the 2011 IEEE PES JTCM from 1:00 p.m. to 4:00 p.m. on Monday January 10, 2011 in Room Atlanta 2-3 of the Atlanta Sheraton Hotel. There were approximately 40 people in attendance. Following presentation of the mandatory patent infringement and litigation slides, the chair discussed, and apologized for, recent mailing list difficulties that may have resulted in a limited pre-meeting e-mail notification. The Chair also notified the Working Group that our PAR had been successfully withdrawn, re-submitted, and approved for an additional 4 years. It is now set to expire in December 2014. This discussion was followed by approval of the previous meeting minutes (Minneapolis) and introduction of attendees.

Two presentations:

- Aaron Prazan discussed the recent formation of Ontario, Canada’s Street Light Asset Committee. He provided a description of the reasons for formation of this group, and

highlighted activities to date. The chair indicated that a representative of this committee would be asked to present at the General Meeting in Detroit next July.

- Dave Crudele gave an interesting and informative presentation concerning recent research that has taken place at EPRI regarding contact voltages that may exist in the vicinity of energized flooded distribution equipment (i.e. a dead front padmount transformer and a secondary pedestal).

Prior to the meeting a draft of Clause 4, the General Discussion section of the guide being worked on was provided to everyone on the group's mailing list. Comments were solicited, and these comments were discussed during the Atlanta meeting. A revised draft, based on comments received, will be re-circulated when available. It will then be placed on the group's web site as the first draft of Clause 4 (i.e. General Discussion).

Prior to the meeting a draft of the "not to exceed" table discussed at the end of the General Meeting in Minneapolis was provided to all on the mailing list. Comments were solicited, compiled, and distributed to Atlanta attendees. Unfortunately, there was no time for discussion. The meeting was adjourned.

#### ***WILDLIFE PROTECTORS – Caryn Riley, Chair***

The Guide on Electrical Testing of Wildlife Protectors was approved by the IEEE Standards Association. Working Group members will be reviewing the proofs of the Guide.

#### **LIAISON REPORTS**

##### ***Insulated Conductors – John Banting***

The Committee met in October 2010. They will be revising the IEEE 386 Standard for Separable Insulated Connectors for Power Distribution Systems Above 600 V and IEEE-1215 Application guide for Separable Connectors

##### ***Power System Relaying Committee – Fred Friend***

The next PSRC meeting will be at the Renaissance Hotel in Ashville, NC 16-19 May 2011.

Working Group C2 is preparing a report to the PSRC to identify the functions and data available in Protective Relaying Devices used at different functional levels and different applications within a Smart Grid.

Working Group D2 is revising and updating C37.104 – Guide for Automatic Reclosing of Line Circuit Breakers and AC Distribution and Transmission Lines.

Working Group D11 is preparing a report to the PSRC describing the effect of Distribution Automation on Protective Relaying.

Working Group D26 is revising and updating C37.114 – Fault Locating Guide.

Working Group H2 is preparing a report to the PSRC describing protective relay applications that can make use of the communication infrastructure provided by the Smart Grid.

*SCC 21 – Bob Saint*

### IEEE 1547 Interconnection Standards

<b>1547- 2008</b> Standard for Interconnecting Distributed Resources with Electric Power Systems
<b>1547.1 - 2005</b> Conformance Test Procedures for Equipment Interconnecting DR with EPS
<b>1547.2 - 2008</b> Application Guide for IEEE 1547 Standard for Interconnection of DR with EPS
<b>1547.3 - 2007</b> Guide for Monitoring, Information Exchange and Control of DR
<b>P1547.4</b> Guide for Design, Operation, & Integration of Distributed Resource Island Systems with EPS
<b>P1547.5</b> Guidelines for Interconnection of EPS >10 MVA to the Power Transmission Grid
<b>P1547.6</b> Recommended Practice for Interconnecting DR With EPS Distribution Secondary Networks
<b>P1547.7</b> Draft Guide to Conducting Distribution Impact Studies for DR Interconnection

Current 1547 Projects

Microgrids

**P1547.8 (new)**  
**Extension of 1547,**  
e.g. grid support, energy storage, ride-thru, etc.

<http://grouper.ieee.org/groups/scc21/index.html>

#### Status of SCC21 (1547) Working Groups

- 1547 Series Next Meeting – February 8-11, 2011 – Las Vegas  
P1547.7 and the first meeting of 1547.8
- P2030 Series Next Meeting – February 22-24, 2011 – New Orleans  
P2030 – Interoperability  
P2030.1- Electric Transportation Infrastructure  
P2030.2 – Energy Storage Interoperability

Further information can be found at <http://grouper.ieee.org/groups/scc21/>

#### **P1836 and P1837**

Control of harmonic current in power systems has been an ongoing issue for many years. Power systems are sometimes modified to accommodate or mitigate the harmonic currents. This increases the cost of the power systems. Some utilization equipment has been modified to demand less harmonic current. These modifications require a higher purchase price for the equipment. In every case, users ultimately bear the cost of both solutions. The challenge

continues to be striking an appropriate balance between utilization equipment costs and higher supply costs.

Two standards approaches have been taken to find the optimum solution. One approach, such as IEEE 519, builds site specific, engineered solutions at a point of common coupling. This point of common coupling is the interface between utility and customer, but could be elsewhere. Another approach, given in IEC 61000-3-2, places specific limits on specific forms of utilization equipment drawing a current of 16 A or less. A companion document, IEC 61000-3-12, considers larger equipment drawing current up to 75 A. Both the IEEE and the IEC methods offer some benefits.

The IEEE standards have favored the IEEE 519 approach for many years. It works well for large point loads. It may not work as well for smaller distributed loads, and is not intended for equipment purchase specifications. IEEE 1836 and 1837 will consider the IEC 61000-3-2 and -3-12 approach for North American power systems. This work will determine if 61000-3-2 and -3-12 should be adopted, modified, or are not needed for North America.

Consensus was not easily achieved on IEC 61000-3-2 and -3-12. Reaching consensus for the best approach in North America may prove to be challenging as well. Achieving minimum overall cost will require solid data for utilization equipment, utility systems, and building designers. It seems appropriate for all representatives to quickly begin gathering their data and business cases for our effort.

- **Utilities** should gather solid information about harmonic distortion trends, forecasts, and whatever costs will be associated with supplying unmitigated harmonic currents. Special emphasis should be placed on widespread trends caused by large quantities of utilization equipment in the market. Information about energy demand for various product classes will be most useful. It will be more important to consider commercial and residential distribution systems. Harmonic problems with large industrial point sources are out of scope.
- **Utilization equipment manufacturers** should gather solid information about incremental costs to meet IEC 61000-3-2 and -3-12. We will need good estimates of market penetration and harmonic demands for existing equipment and net reduction, if any, for 61000-3-2 and -3-12 compliance. It will be important to understand how much equipment in the market already complies. Also, prepare to bring information about alternative solutions that come close to, but may not fully meet 61000-3-2 or -3-12 as appropriate. It will be important to hear about configurations that achieve most of the benefit at a fraction of the cost.
- **Building designers** should gather information about incremental costs, if any, of building wiring systems to accommodate higher harmonic currents. Be prepared to present what requirements, if any, are already adopted by code making authorities.
- **All members** should research and present other IEEE, NEMA, ANSI, CEA or other standards that already limit harmonic current for specific equipment. For example, the

lighting industry adopted harmonic current limits for certain products. It will be helpful for all of us to understand what is in place today.

Each interest group will have an opportunity and responsibility to accurately inform all members. The information should be clear and easily understood. Each member is encouraged to be concise in order to allow all members time to present their case.

## **STANDARDS**

### ***NESC – Rusty Soderberg***

The NESC subcommittees met last fall to discuss comments that were received and to vote on the 2012 NESC change proposals. Draft 2 of the 2012 NESC is currently being circulated among the NESC Distribution Subcommittee members for comment.

The change proposals to eliminate the 60 foot exclusion in Rules 250 C and 250 D were voted on and rejected. The 60' exclusion allows most distribution poles to be exempt from certain analyses. I, as well as most of the other members of NESC Subcommittee 5, "Strengths and Loadings" voted against the removal of this exclusion.

A note was added to Table 251-1, "Temperatures and Constants" to state that aerial spacer cable systems (ASC) must add the K factor to all conductors and the messenger. Most if not all utilities just apply this factor to the messenger. This change will possibly result in reduced span lengths for ASC systems and possible tension restrictions on the messenger. I and many others spoke out against and voted against this change and I also had the industry send in their comments, however the change was still passed.

The tension temperature limits were changed in Rule 261H1b. This change was aimed at reducing aeolian vibration generally associated with transmission lines, however this change would have also affected distribution. Some members of Subcommittee 5, including myself suggested adding wording to say that if experience has shown there are no problems at the old temperature limit then the new limits do not have to be used. The temperature limit change should therefore have minimal impact on distribution.

Tables were added to the Code for clothing requirements for arc flash protection when working on systems from 50-1000 Volts.

An NESC task force has been created to rewrite the strength and loadings section of the Code to include Load and Resistance Factor Design (LRFD). This will most likely be a change proposal for the 2017 Code. Distribution will be negatively impacted by this since additional analyses and complexity will be added to the Code. I have joined the task force so that the distribution voice is heard.

### ***NEC – Greg Obenchain***

No report is available.

**PRESENTATIONS**

There were no presentations at this meeting. Presentations from previous meetings are posted at the Distribution Subcommittee website:

<http://grouper.ieee.org/groups/td/dist/presentations/>

**Appendix: Current Membership Roster**

Chair: Warren, C., Waltham, MA  
Vice Chair: McDaniel, J., Syracuse, NY  
Secretary: Tobin, E., Everett, WA

Arden, D., Minneapolis, MN  
Asgharian, D., Portland, OR  
Banting, J., Pewaukee, WI  
Bouford, J., Augusta, ME  
Burke, J., Cary, NC  
Carroll, P. Milwaukee, WI  
Caswell, H., Portland, OR  
Christie, R., Seattle, WA  
Clark, L., Birmingham, AL  
Cole, J., Bozeman, MT  
Delmas, H., Montreal, QC  
DeNardo, C., Milwaukee, WI  
Ehrlich, R., Newark, DE  
Friend, F., Charleston, WV  
Frost, K., Oakbrook Terrace, IL  
Gilmer, D., Craig, CO  
Goodfellow, J., Redmond, WA  
Hall, D., Newark, DE  
Hayes, H., St. Louis, MO  
Hoogendam, I., Portland, OR  
Jones, J., Salt Lake City, UT  
Khodaie, M., Albuquerque, NM  
Lambert, F., Forest Park, GA  
McDermott, T., Pittsburgh, PA  
McGranaghan, M., Knoxville, TN  
Moran, N., San Francisco, CA  
Nielsen, T., Minneapolis, MN  
Obenchain, G., Washington, DC

Ochoa, L., Manchester, UK  
Pahwa, A., Manhattan, KS  
Patterson, M., Boise, ID  
Pehosh, M., Arlington, VA  
Razon, A., Arlington, VA  
Riley, C., Forest Park, GA  
Rizy, T., Oak Ridge, TN  
Robinson, R., Topeka, KS  
Romero Aguero, J., Raleigh, NC  
Russo, D., Seattle, WA  
Sabin, D., Knoxville, TN  
Saint, B., Arlington, VA  
Schwalm, A., Victor, NY  
Short, T., Ballstonspier, NY  
Siew, C., Burnaby, BC, Canada  
Simard, G., Montreal, QC, Canada  
Smith, J., Phoenix, AZ  
Soderberg, R., Jackson, MI  
Taylor, L., Charlotte, NC  
Thatcher, M., Kansas City, MO  
Venkata, S.S., Oro Valley, AR  
Viglietta, J., Philadelphia, PA  
Walling, R., Schenectady, NY  
Wang, D., New York, NY  
Ward, D., Richmond, VA  
Welch, G., Raleigh, NC  
Williams, C., Maitland, FL  
Yuen, D., Bellevue, WA