

Approved Minutes from WPM 2002

To: Working Group on System Design
CC: Dan Ward, Dan Sabin
From: Cheri Warren
Date: 2/19/2002
Re: Minutes from the Working Group on System Design from the 2002 Winter Power Meeting in NYC

57+ members and guests attended the meeting that began at 8 AM.

1. We request a BIGGER room!

The minutes from the SPM 01 were approved with one wholesale change. Members were asked to check email addresses on the membership list and make any corrections necessary.

Minutes from the 2001 IEEE/PES Summer meeting and the 10/26/01 and 1/4/02 WEBEX meetings were distributed and reviewed. All of the minutes were approved with the only correction being that f and N were transposed in the original minutes.

The document: "*QUALITY OF ELECTRICITY SUPPLY: INITIAL BENCHMARKING ON ACTUAL LEVELS, STANDARDS AND REGULATORY STRATEGIES*" was passed around for members to review. It is attached to this e-mail.

The WG web site can be found at: <http://grouper.ieee.org/groups/td/dist/sd/>. We have asked for a secure area since we are using sensitive information in our analyses. These minutes will be posted there once the area is secure. You will be informed by e-mail when the site is ready.

TF on Outage Reporting Practices – Chair Dan Pearson - PGE

The Task Force paper has been submitted to IEEE and is in the approval process. EEI has formed a similar group and coordination with this group was discussed.

TF for Reliability Indices P1366 - Chair Cheri Warren - Navigant Consulting

There has been a tremendous amount of work being done, especially by a sub-group of 8 members.

The question on how to handle step restorations was brought up by Jim Cheney of APS. He would like to see clarification for feeder lockouts, especially for those cases when the feeder is partially restored and then locks out again. It was agreed that in these cases that the outages should be counted separately. This would be especially true if there were different causes to the outages. If they were not count twice (or as many times as it

happened) then SAIDI would be distorted. Language will be added to 1366 to clarify this point with examples added to the Annex.

A short discussion about IEEE Standards creation of the Full Use Guide, 1366 – 2001, then followed. Apparently the electronic copy sent out to the members from the Standards department was the 1998 Trial Use Guide, with none of the updates. The latest version of the draft is located on the Working Groups web site:

<http://grouper.ieee.org/groups/td/dist/sd/>. The user name is: sysdes and the password is: 150602wg .

Major Event Definition Background: by Cheri Warren

Fundamentals:

- Purpose is to partition the data into Normal and Abnormal days
- To rigorously analyze and report on Abnormal Events
- Normal Events can be used for trending, internal goal setting and Commission mandated targets
- Definition must be understandable to all and easy to apply
- Definition must be specific and calculated using the same process for all utilities
- Must be fair to all utilities (large vs. small, urban vs. rural)

Definition must be extensible

- This approach must address varying levels of data collection
- Current definition needs reevaluation
- Draft proposal by...
- Discuss options

Methods:

10%, Bootstrap, 3 Sigma (σ)

- 10% applied on a system wide (operating company) or operating region basis over a 24-hour period
- Bootstrap – agree with Commission on expected MED's (Major Event Days) per year (f)
 - Using previous N years data (SAIDI/day)
 - Sort descending with top $f*N$ being the MED's
- Sigma approach
 - Use's Crystal Ball (by Decisioneering)
 - SAIDI/day (CMI/day) best fit
 - Determine mean and standard deviation (these are geometric mean and S.D.) (see PowerPoint slides for equations – slides are located on Working Groups Web page)

In the early state of data collection maybe use the method proposed by Jim Bouford which used CMI/day vs. Number of interruptions and was a graphical model. Bootstrap and Sigma method evolved out of this method.

Sigma Method – Equity between utilities of different size? For more information, see:

www.ee.washington.edu/people/faculty/christie

Need to choose a method and proceed

Rodney Robinson, Western Resources – differences is system versus regional approach. For more local, or regional, approaches there is more volatility in the data and hence the difference is raw versus normalized data. There are different ways in which the data can be analyzed: A Regional basis, An Operating Company basis, and A Parent (or Holding) Company basis. Charlie Williams (FPC) pointed out that this is a Guide and documentation should be done for each Major Event.

There were then 5 presentations made. They were:

- a) Presentation by Mike Sheehan - PSE
- b) Presentation by John McDaniel - DTE
- c) Presentation by Jim Cheney - APS
- d) Presentation by Dan Kowaleski – Exelon
- e) Presentation by Charlie Williams - FPC

Mike Sheehan – Puget Sound Energy.

Company formed after merger of gas and electric company.

Needed to set minimum levels of service (partially due to local phone companies lack of service). For PSE 5% of customers interrupted is a Major Event (as defined by their Commission).

Limitations of P1366:

- All customers, outages are equal
- Major storms are limited
- Momentary outage definition
- Sub transmission not included

Two-state model:

- Normal and Adverse weather
- Average Failure rate (includes Normal and Adverse)
- Failure rates vs. Events
- Once the threshold is reached – event goes until all customers are restored
- Uses maximum wind speed (2 minute average a Sea-Tac)

Event days per year – 1999 was greater than other years (wind storms were more severe in 1999) were SQI (Service Quality Index) measured. The general trend for PSE SQI is decreasing. Got approval to trim trees out of ROW with 97% landowner approval.

John M^cDaniel – Detroit Edison

Compared the different methods.

- Used both Sigma (3 and 6) and Bootstrap (f of 2 and 3)
- Used both 3 and 5 year rolling (data from 1996 thru 2001)

- Raw SAIDI had great variability but Normalized SAIDI's (and SAIFI's) did not have much variability
- No days were segmented using the 6 sigma method
- For all of the other methods there was not much difference (in the normalized indices) in the other methods (at least with Detroit Edison's data)

Jim Cheney – Arizona Public Service

APS data is Log-Normal

Bootstrap Method of $f = 3$ and $N = 5$

- Half of the days selected considered “normal” by APS
- Most of the “normal” segment days are in rural areas where it take a long time to find and repair the outage
- No weather (major) problems
- Each utility is urged to look at their data.

Dave Gilmer (Yampa Valley Electric Co-Op) has the same issues as APS. Need to provide some judgment. It was pointed out that these were statistical methods and definitions.

It was also pointed out that we are “Segmenting” not “Excluding”. This is for trending purposes. Commissions will decide on what is segmented. The segmented data is statistical outliers and each event should be reported on.

Dan Kowalewski – Commonwealth Edison

Dan's presentation is attached.

The 3 Sigma method allows an “Apples to Apples” comparison.

Brought up the difference in Operating Companies vs. Parent (Holding) Companies.

Pointed out that we don't need a “Perfect” method, just one that works!

Charlie Williams – Florida Power Corp.

Weather is highly variable along with its affects on Reliability. Showed FPC SAIFI trends – both actual and predicted (based on lightning activity).

Showed a short presentation on July 2000 Suncoast storm. In this storm, the Tampa Bay area received a full years worth of lightning activity in just one day.

Guides Objectives:

- Report performance trends
- Provide recommendations for classifying major events
- Utilities must detail causes for major events
- Regulators decide on “exclusions” (segmented days)
- Intended as a Guide for calculating and reporting on reliability

- Not an excuse or justification for exclusions
- Provides a trigger point for consideration of events as Major Events

Issues:

- Major Events should be self defining
- Should be reported on in detail (internally and to Commissions)
- PUC to decide what is segmented

Open Discussion:

- Neither method is perfect
- Both methods provide reasonable results
- ComEd supports the 3 Sigma method – Explain the method and develop a spreadsheet were user can plug-in their data and spreadsheet does the rest
- No method is perfect, go with one and don't make comparisons.
- Have the number of customers – region vs. company
- Run both ways if utility can
- Does not make a difference on which method is used – results are close
- Don't want a standard
- PPL supports the 3 Sigma method
- Need to include enough caveats and discussion as to why it is not fool proof
- If we select a method we are getting close to standard. Identify the weakness and drawbacks that all of us continue to prove it. Need to state that this is NOT a standard
- Definitions are in the Guide (1366) and the Guide is good for 5 years (until 2006). Examples and explanations are in the Annex
- Definition for sustained outage (doesn't really matter)
- PECO – no 6 Sigma events (number of customers out).
- Pick a definition and go with it. Won't be perfect.
- Get rid of 6 Sigma events because they will skew the data
- Small utilities have no 6 Sigma events. Throw out the ones that will saturate the data. Then establish the thresholds using 3 Sigma.
- Ask Charlie Williams – if the 6 Sigma events taken out, what would happen to FPC data – Likely reduce the numbers a bit. Weather variations play a big difference in the segment days.
- 3 Sigma may allow more days to be segmented in areas with good weather.
- Go ahead with 3 Sigma and put in anecdotal accounts

Method:

- Build to 5 years then roll
- Day that outage starts and roll in the CMI (SAIDI) into that day
- Don't throw anything out
- For zero (0) days – put in lowest days SAIDI
- SAIDI/day (Has to be Log)
- Total customers served
- (Log normal definition)

WEBEX meeting sometime in early March

3 Sigma approach to be sent to EEI for their surveys

Momentary versus Sustained outages

- In Illinois – 1 minute definition
- 5 minutes used in current guide. In part due to older automation schemes where it could take up to 5 minutes for them to operate
- Very few outages are between 1 and 5 minutes in where human intervention is required

The next topic for the group to tackle is: Customer Definition

Also, difference between 1366 and 1159 for momentary vs. sustained outages (1366 time was established first). PQ folks seemed to have set their own definition without reference to 1366.

The group is planning on sponsoring a panel session at the Summer meeting. Charlie Williams and Wanda Reder (or someone else from ComEd) volunteered. Rich Christie was also “volunteered”. Abstracts are due by February 12 and full paper by March 12.

The Round Table was postponed until the Subcommittee meeting at 1 PM.

**TF on System Design from a Reliability Perspective - Chair Jim Bouford
National Grid**

This task force abdicated their time for the major event discussion. They expect to meet during the next meeting.

New Business

Panel Session for SPM – Defining Major Events