

Approved Minutes from Webex Session on October 26, 2001

To: Working Group on System Design
CC: Dan Ward, Dan Sabin
From: Cheri Warren
Date: 10/29/01
Re: Minutes from the Working Group on System Design meeting held via Webex on 10/26/01

40+ members and guests attended the meeting, which took place from 12 – 2 Eastern Standard Time.

The meeting was held for two main reasons:

1. To continue the work on the Major Event definition.
2. To test the Webex technology to determine feasibility for meetings

Both objectives were accomplished. Feedback from the group indicates that the use of the technology was a success. The group has indicated that they would like to have webex meetings scheduled once a month (give or take a week) around the same time. I do intend to make one meeting a little later so we can get participation from the Western ½ of the world. It is anticipated that not everyone will attend every meeting. Some members indicated a preference for this type of meeting because it allowed many parties to participate from each utility. ***The only issue now is to investigate how IEEE can pay for the phone call.***

Agenda

For this trial meeting, only the task force on Reliability Indices (P1366) met. The agenda:

1. Discuss a methodology created by Charlie Williams of Progress Energy.
(CHARLES.WILLIAMS@pgnmail.com)
2. Discuss a methodology created by Rich Christie of University of Washington
(christie@ee.washington.edu) .
3. Do a quick State Update on regulatory issues.

Many thanks for both Charlie and Rich for preparing two excellent methodologies and for their informative presentations!

Methodologies Explained

Charlie Williams Approach

Our goal in modifying the major event definition is to make it clearer and easier to apply globally. An important concept is that days are NOT EXCLUDED but SEGMENTED or RE-CLASSIFIED! No data or information is ever lost in the process. In fact, the original write up calls for significant explanation of days that are abnormal. So, in this vein, regardless of whether a substation fire or an ice storm makes a day abnormal, you will still be asked to provide detailed explanation of the events. This question came up during the presentation and Charlie answered by saying that no one designs for a substation fire, so that should be segmented.

The question came up about why CMI not CI. CMI is used because your crews saturate after so many outages. Another question came up about storms that roll into more than one day. If the CMI was not great enough to push the second day into the abnormal day category then it is not an abnormal day. If the event is big enough then prudent practice says additional crews should be gathered from what ever sources is available.

A copy of Charlie's presentation was mailed to the group. Charlie uses Decisioneering's Crystal Ball product for part of his analysis. If you are interested in this software, there is a seven-day trial available on the web at <http://www.decisioneering.com/>. This method chooses 6 sigma as the threshold beyond which an abnormal day is declared. Charlie noted that the beauty of this approach is that it is statistically based and therefore subject to less debate.

Rich Christies Approach

Rich's presentation can be found at www.ee.washington.edu/people/faculty/christie . Rich uses Excel for his analysis. He has presented two methods – a simple, boot strap method and a complicated method. Both are explained well in his presentation and he had given us an example in the file utility2.xls, which is also on his site.

Some excerpts from Rich's papers:

"This white paper proposes defining a major event day in distribution reliability in terms of average frequency of occurrence. This definition is easy to understand for nontechnical people like regulators, seems to be fair to apply to systems of any size, and can be translated into a major event threshold that can be used to classify individual days. An example of this classification is given and practical issues such as the type of probability distribution to use, how to handle zero-outage days, and calculating normal annual reliability with major event days removed are discussed and resolved."

Rich noted that he chose this approach in an effort to create a methodology that is equitable for both large and small utilities. The group will need to choose the appropriate number of major event days (MED).

Many participants noted that the methodology must be relatively simple in order for regulators to understand it. We also need to get more regulatory participation once we are further along in methodology development.

The Data and our Web Site

Our Working Group web site is at:

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

To view the standards you will need a user name and password.
E-mail Cheri Warren for this information.

In order to proceed with the work, we are asking members to supply anonymous data for analysis using both of the presented methods. The goal is to assess each so we can select the one that works for the majority of utilities. The core data we require on both a system and regional basis:

1. CMI per day for as many years as possible
2. number of customers served per year
3. number of outages per day

Now, as with all data questions, there is data and there is data! What is included? Everything that you have! This means whatever you are mandated to record. It would be great if you specify if the data includes outages with the following causes:

- services
- secondaries
- distribution
- subtransmission
- transmission
- generation
- customer caused
- caused by others
- scheduled
- anything else that you think might differentiate your data from others.

Theoretically, the scheduled, customer caused, ... will just add to the ambient noise and shouldn't cause any difference in the conclusion. If we begin excluding things, then we end up in definitional issues that should be avoided at this stage.

On Rich's web site is a sample of the type of data we require. It is from Utility 2.

PLEASE PROVIDE IN MS EXCEL OR MS ACCESS FORMAT.

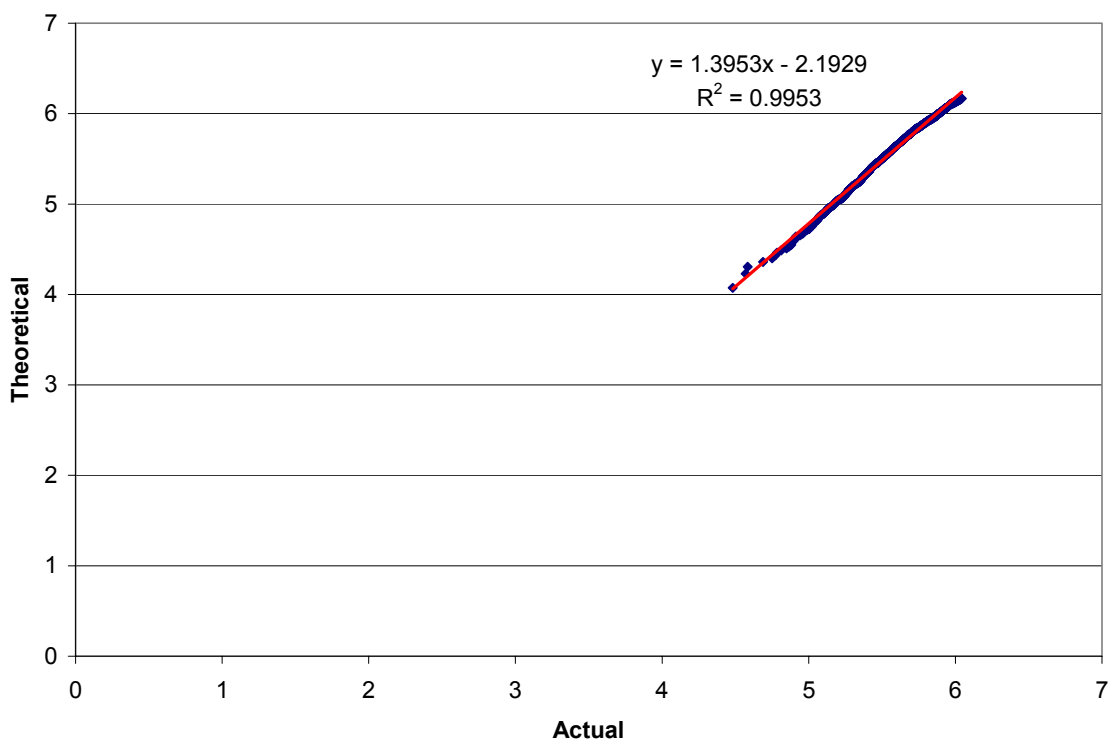
Data Analysis

Both Rich and Charlie are willing to run your numbers. In order to keep the exercise anonymous, please send the data to me and I will pass to the others thereby keeping the sources anonymous.

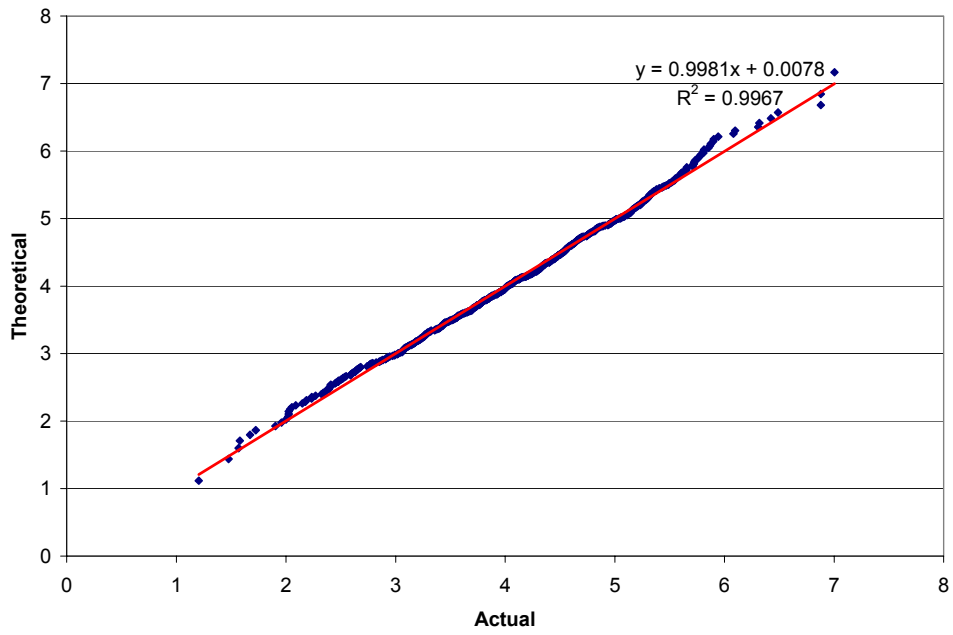
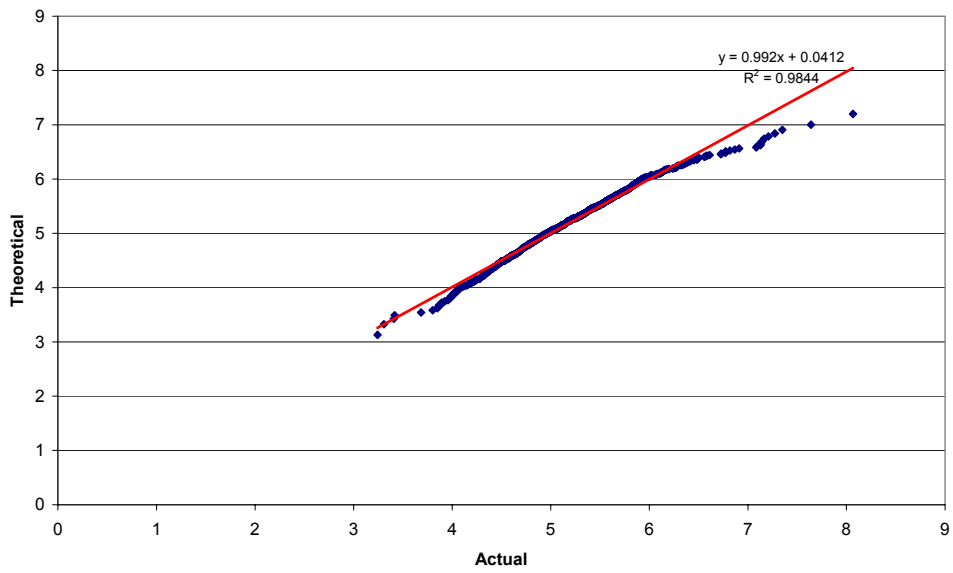
Rich Christie was kind enough to summarize action items after the meeting as follows:

1. Is all, or effectively all, utility daily SAIDI log-normal? Solve by looking at lots of utility data.
2. Frequency or standard deviation to identify MEDs? Resolve by discussion
3. Can we agree on national parameters, i.e. 3 days/year or 3 or 6 standard deviations, based on how many years of data.
4. Can we discuss MED classification levels in terms of design and operating costs?
5. Apparently the national weather service definition of severe weather omits things important to distribution systems, like lightning. Can we devise a distribution system severe weather (or, stress, if we want to include locusts...) index, and correlate that to MEDs?
6. What about those departures from log normal at the top end of the distribution (seen in 2 of 3 utilities I looked at. Officially I only looked at 2, one is solid log-normal and the other has the high tail.) Is there a statistical way to identify whether a separate process is at work?
7. Eventually someone has to draft language for P1366.
8. How do we sell the eventually standard to PUCs.

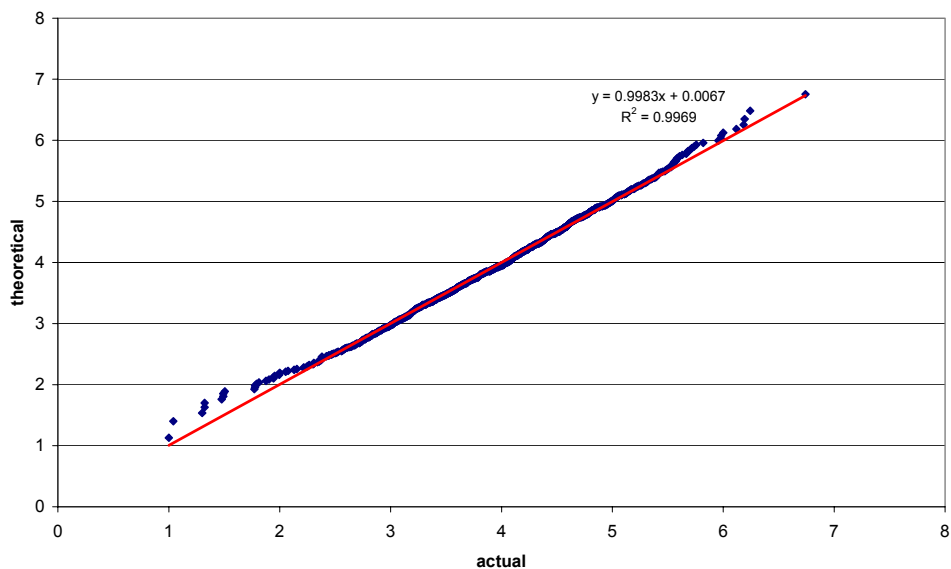
I had run the data that we already had through the log normal test. Below please find the graphs. The objective is have the points fall on a straight line.



Log Normal Another Utility



log normal - yet another utility



Other Business

1. ComEd has asked that we re-examine the momentary definition. Charles Perry also raised this issue recently.
2. APS has asked for time on the WPM agenda to discuss step-restoration.