

Wavewin User Group Meeting

Philadelphia Hyatt Regency – Penn's Landing
Minutes of the Meeting, June 5th – 7th, 2012

Officers

Jeff Pond	(Chair & Vice Chair)
Maria Rothweiler	(Planner & Secretary)
Amir Makki	(Treasurer)

Attending Members

Jeff Pond	(NGrid)
Eric Conley	(NGrid)
Bill Royse	(Progress Energy - R)
Shi Jiang	(Con Edison)
Parshwa Shah	(Con Edison)
Angela Rothweiler	(PSE&G)
Bill Strang	(Softstuf)
Bob Johnson	(First Energy)
Tom Owens	(Virginia Power)
Robert Orndorff	(Virginia Power)
John Walsh	(SBTS LLC)
George Semati	(TIS Labs)
Mark Taylor	(Softstuf)
Frank Rothweiler	(Softstuf)
Maria Rothweiler	(Softstuf)
Amir Makki	(Softstuf)

R = Retired

Meeting Location

Hyatt Regency Hotel – Penn's Landing
201 South Columbus Blvd
Philadelphia, PA

Meeting Summary

The chair began by thanking the group for attending the annual Wavewin user group meeting and then introductions were made. The chair reviewed the agenda and the first session started with John Walsh discussing the Wavewin Sniffer 24.

The three day meeting proceeded as follows:

- 1st day, morning session: "**Wavewin Sniffer Session**" moderated by John Walsh.
- 1st day, afternoon session: "**NERC Cyber Security/Disturbance Monitoring Session**" moderated by Amir Makki & Jeff Pond.
- 2nd day, morning session: "**Fault Data Analysis Session**" moderated by Amir Makki & Maria Rothweiler.
- 2nd day, afternoon session: "**Fault Data Collection Session**" moderated by Mark Taylor.
- 3rd day, morning session: "**Planning Session**" moderated by Jeff Pond.

Wavewin Sniffer Session (Tuesday June 5th – Morning Session)

The session started at 8:30 am. The following issues were discussed during the Wavewin Sniffer session:

1) Discussions and Requests:

- Change local time to offset from UTC in the File Properties dialog. Suggested by Jeff Pond.
- Take out the apply current use apply analog values in the Calibrate Sensors dialog. Suggested by Jeff, Bob and Mark.
- Deactivate trigger mode when in calibration mode. Suggested by George, Robert & Tommy.
(Action Item: Priority)
- Data file management
 - a) When a trigger file is created always monitor the free space of the flash drive. Suggested by Eric.
 - b) When saving a trigger file monitor the size of the flash drive and if the size is within a certain % delete the oldest files. Suggested by Tommy.
 - c) Add an alarm to notify that maintenance is needed, flash drive is full. Suggested by Angie & Tommy.
- Add an additional flash drive or a USB thumb drive for archiving the oldest files when the free disk space on internal flash drive size is within a certain %. Suggested by Jeff, Eric & Maria. (add a user field if drive is full use e:\xxxxxxx).
- Rename the Upper and Lower columns in the Hysteresis Trigger tab to Above and Below. Suggested by Robert.

- a) Automatically set the values for the above and below columns according to a user entered %. Usually 10%. Suggested by Robert, Tommy and Jeff.
 - b) May be a fixed value not always a percentage. Add a section in the File Properties dialog for setting the above and below. Suggested by Jeff Pond & Amir.
- Move the Above, Below and Absolute fields to an Advanced dialog for each channel. Same layout as the channels in the main window (tabs and scroll bar). Suggested by Mark and Jeff.

NERC Cyber Security/Disturbance Monitoring Session (June 5th, Tuesday – Afternoon Session)

The session started at 1:00 pm. The following issues were discussed during NERC Cyber Security session:

1) Discussions:

- Jeff Pond presented the latest PSRC Working Group Standards for the PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements and the PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting.
- Amir, Angie & Maria gave an overview of the latest changes that were made to the device manager polling with lessons learned from a project developed for Progress Energy. Amir and Maria described the process of reading event data from the SEL-735 meters and the changes that had to be made to the SEL polling driver to satisfy appending events. Process the history report starting from the oldest event to the latest event (bottom to top). The polling process was changed to request a history on the latest 48 events.
- Amir explained how Wavewin can now extract information from the SEL Load Profile and SER records and save the data in a comma delimited file in the defined Save path.
- Angie talked about the process of reading the LDP and SER comma delimited files and the event data and passing it to a database such as SQL, Relational and PI.
- Amir started a discussion on how Wavewin can help become compliant with the CIP standards such as Setting Management and Password Management. For setting management add a new driver to read the settings for the SEL devices. Save the settings for each device and compute a CRC on the entire file. When the next poll is processed, compare the previous CRC with the new computed CRC to see if any changes were made to the settings. (Action Item: Research)
- Discussed how to update the Wavewin device manager passwords automatically if changed by third party software.

Fault Data Analysis Session (June 6th, Wednesday – Morning Session):

The session started at 8:30 am. The following issues were addressed during the fault data analysis session:

1) Discussions and Requests:

- Amir gave a demonstration on the new double ended fault location dialog. The fault location result is based on the entered line length. If there is no line length entered then the fault location gives the percentage of line. If a line length is entered then the result is the distance in miles from the near end. Tommy suggested to display both (% and miles).
- Tommy pointed out when calculating the distance to the fault manually the fraction portion is displaying the wrong value (fraction value is off). Amir determined that this could be due to truncation errors. Amir and Maria agreed to look in to the specific equations to eliminate the fraction difference.
- Amir pointed out a number of problems in Wavewin when ran under Windows 7. (Action Item: Complete)
 - a) Windows sizing problems with certain dialogs.
 - b) Editor marking in the ASCII editor seems to be a space problem.
 - c) Date and Time in menu bar is constantly blinking.
 - d) If a dialog does not fit in the screen always display scroll bars to scroll through the dialog.
- Always remember the application size and left and top position. Also remember the size of the child windows and their left and top positions (file manager, data plotting and ASCII editor). Complete for main application and works with multiple monitors. Suggested by Jeff.
- Robert gave a presentation on the implementation of the Traveling Wave Fault Location they have installed and how the results from the TWFL compared to the Wavewin Double Ended results along with the Relay and DFR fault location results.
- Amir discussed how to make the double ended more accurate for high impedance faults. The group also discussed how to determine the fault location on a tapped line. Amir requested that George research adding impedance to the fault equation.
- Amir, Tommy, Robert, Jeff and Bob discussed what the fault location phase angle result represents. No definition was determined so Bob requested to have the IEEE Standard C37.114 emailed to him to look at what phase angle of fault result means.
- Maria and Amir gave a presentation on the latest additions to Wavewin.
 - a) Presented the new feature to the auto convert to Comtrade. It now allows for the conversion process to start automatically at run time. A new field was added to the dialog to monitor in minutes when the next conversion process will start. Robert

requested to also allow for the conversion to start at a specific military time. Use the T command to specify fixed time processing. (Action Item: Priority)

Bill Royse requested to have multiple tabs to allow for different sessions defining different source paths. His current system stores all their Rochester Data according to a substation hierarchy. (Action Item: Priority)

Also the auto convert to Comtrade needs to be tested with the Tesla AutoComtrade.exe application. Make sure the files are not being converted to Comtrade two (2) times. (Action Item: Research)

- b) Demonstrated the new feature that reads and displays the APP and USI line groups. The APP and USI line definitions are stored in the Comtrade .INF files. They both use one (1) INF file for each DFR. The line definition file name is included in the Comtrade .DAT and .CFG long file names. Since the line definition (.INF) files can be located anywhere on the hard drive or networked drives two (2) new fields had to be added to define the location of the files. The two (2) new fields were added to the Device Configuration dialog. Under the driver column the APP Comtrade Files and USI Comtrade Files drivers now have field entries to enter the location of the line definition files. Robert pointed out that his directory information was not being saved. Maria corrected the problem.

The APP and USI line definitions also include the Line Length, Z1 and Z0 settings. Wavewin reads these three (3) fields for automatic population into the Single Ended and Double Ended Fault calculators.

Robert and Tommy requested that the Z1, Z0 and Line Length also be read from the Emax .CTL file. Robert gave Maria a copy of the Emax Director and Longterm file format documents. (Action Item: Priority)

- c) Demonstrated the new user defined shortcuts. A few weeks before the user group meeting Robert requested to make frequently used deep menu items more easily accessible. A new dialog was designed to have the user select what menu items they what displayed in the new user shortcut drop down menu button displayed in the file manager and data plotting button menu bar. The new feature was well received. Maria requested that the new feature first be signed off by Amir before being released to the users.
- d) Maria demonstrated the new Wavewin Web ActiveX application. The ActiveX was well received and it gives light to storing fault records in a database and using the

Wavewin Web application to plot data from the database starting at a specific time to an end time or duration (cycles). A number of new names were discussed for the web application: WaveWeb, WavewinX and Wavewin Lite. Jeff also suggested to use cookies to store the user settings.

- e) Amir discussed the new SOE Manager. The SOE manager reads the event files from the source path, composes a list of the digital channel states and times, displays them in the SOE manager. The SOE list can be saved to an ASCII comma delimited file.

Fault Data Collection Session (June 6th, Wednesday – Afternoon Session)

The session started at 1:00 pm. The following issues were discussed during the fault data collection session:

Bill Royse opened the fourth session with a presentation on his current role at Progress Energy and his past experiences working with different types of DFRs and Relays. Also, the group discussed the use of modems when connecting to different types of devices.

Bill displayed some event files and detailed some case studies he has been archiving for Progress Energy.

Amir also presented a number of files that were captured with the TIS system in the Con Edison Farragut substation. A number of traces were reviewed. Amir asked the experts in the room what type of signal was being monitored from a Phase B electro-mechanical relay. Amir thought it might be ferroresonance but Jeff disagreed and said it could be 20 hertz sub-harmonics. Amir demonstrated how to change the line frequency of a plot. Amir requested to add a feature to change the line frequency directly from the data plotting window. Jeff pointed out that the change can only be temporary and must be changed to the original line frequency defined in the file the next time a file is plotted for the specific driver. (Action Item: Priority)

Amir and Mark gave a step by step demonstration on how to configure devices in the Device Manager. The SEL relay racks available on-line were used for the demonstration. Bob requested to have the Relay rack configuration sent to him.

1) Steps and Discussions:

- For the main polling driver Amir defined an Ethernet server port. Normally a serial port is used to define the main polling driver. Since serial ports are not available on computers today an Ethernet server port can be used. The server port number was defined at 222222.
- Use terminal mode to connect to the first relay rack to see if it is available. The first relay rack was not available. Successfully connected to the second relay rack. Login into the SEL 2020 and do a “Who” command to display the relays connected.

- Create the first device. The first device to connect to is the SEL communication processor (SEL 2020). Enter all the device fields. Select the connection type as Ethernet. Select the protocol type as TCP/IP Client and enter the device's IP address and port number.
- Create the first device off the SEL 2020. The SEL 451 was selected as the device to poll. Enter all the device fields. Amir selected the Lan, SEL-321/421 driver. Enter the same session number as the one used for the SEL 2020. All devices connected to a communication processor must have the same session number as the communication processor. Also enter Ctrl-4 in the Port back out field. SEL uses the Ctrl-4 (^[04]) command to exit a relay and return back to the SEL 2020.
- Create the quit device to exit out of the SEL 2020 after all devices have been polled. Amir pointed out that the quit driver's device number can be X times greater than the last device defined so future expansion is allowed.
- Start the polling process by clicking on the MID (multiport interrogation display) button. Bob, Jeff, Robert, Tommy and Bill requested to change the MID button to "Poll". MID is not user friendly. Bob suggested using a barber pole as the button's icon. (Action Item: Priority)
- The polling process was unsuccessful. An error of Unrecognized Command was reported by the SEL 451 relay. The wrong polling driver was selected. Amir changed the driver to the SW-SEL, SEL-221/321/421. The group suggested limiting the number of drivers listed under the driver drop down list. Too many drivers can cause confusion. Mark suggested listing only the drivers that are associated with the selected communication type and protocol. (Action Item: Priority)
- Restart the polling process. Polling was successful, however no event files were saved.
- Amir demonstrated how to debug the communication process. He displayed all the commands that were received from the device during the polling process. It was discovered that the date and times listed in the SEL history report were in European time (D/M/Y). The group looked through the settings information and discovered a global setting called DateF: DMY. The group agreed to add support to handle the DateF command in the future. (Action Item: Research and Produce a Specification)
- Amir and Mark demonstrated how to add security to the device manager by adding a password in the Save and Archive dialog.

Planning Session (June 7th, Thursday – Morning Session)

The session started at 8:45 am. The following issues were addressed during the planning session:

1) Discussions:

- **2012 Review:** Review the planning notes compiled by Maria and George during the June 5th and 6th sessions.
- **2011 Minutes:** Reviewed Tommy's notes of unfinished items from the 2011 User Group Meeting.
- **Action Items:** Compiled a list of Priority and Action items to complete before the 2013 User Group Meeting. Listed below.
- **Meeting Format:** Discussed the meeting format. General opinion is that the format is good and a training session such as years past is a good idea to add to the 2013 meeting.
- **2013 Meeting Date and Location:** After some discussion the User Group agreed to move the user group meeting to September. This is because June is a difficult travel month. The User Group members agreed to hold the meeting in September 2013.

Next Year's meeting will be held:

September 24 - 26, 2013
Philadelphia, PA
Location: TBD

- **Officers:**
 - a) Tom Owens accepted the nomination to be Chair of the 2013 working group. The User Group Membership unanimously elected Tom.
 - b) Shi Jiang accepted the nomination to be Vice-Chair of the 2013 working group. The User Group Membership unanimously elected Shi.
 - c) George Semati accepted the nomination to be Secretary of the 2013 working group. The User Group Membership unanimously elected George.
 - d) Maria Rothweiler Makki accepted the nomination to be Treasurer of the 2013 working group. The User Group Membership unanimously elected Maria.

Prepared By

Maria Rothweiler,
Tommy Owens,
Jeff Pond and
Amir Makki.
support@softstuf.com