

# ASPEN OneLiner Version 11.6 Update

Please find enclosed the installation CD for *ASPEN OneLiner*<sup>™</sup> version 11.6. This maintenance release contains fixes for all known bugs to date. If you have a license for the *Breaker Rating Module*<sup>™</sup>, this update contains also an improved Check | Circuit Breaker Short Circuit Rating command. Version 11.6 is Windows 7 compatible.

You can run \1lpf\setup.exe on this CD to create a new installation or to update an existing installation.

Please write (support@aspeninc.com in English or soporte@aspeninc.com in Spanish or Portuguese) or call (650-347-3997) us if you have questions.

## New Features and Improvements

- **PSS/E V32 support:** We expanded the area- and zone-number range to 0-9999 for V32 compatibility. The File | Export | Network Data command for the PTI PSS/E format now supports version 32. We also added V32 support to the PSS/E-to-ASPEN Data Conversion program.
- **Line rating in load-region plot:** The program now automatically inserts one of the line ratings into the dialog box for displaying load regions in the distance-relay window. The default is the fourth current rating of the line.
- **Improved Check | Loadability command:** The command now tests to see if the distance relay trips on load on any zone, not just zone 3, as was done previously. The checking report includes the tripped zone number as well as load data that were used to check the relay.
- **Fault duration in voltage-sag report:** We added the option of showing the total fault duration in the voltage-sag report. The fault duration for each of the faults in the voltage-sag study is computed using a separate stepped-event simulation. The fault-duration information in the report includes the total number of tripping events following the fault, the total duration in seconds, and the final fault current.
- **Larger mutual coupling group limit:** We have increased the internal limit for mutual group size to 300 lines, from 220.
- **New PowerScript param codes:** OG\_nIDirectional, OP\_nIDirectional.
- **New distance relay type P441\_\_:** This vendor-specific distance relay type is for the Areva P441 relay. As with other vendor-specific relay types, P411\_\_ utilizes the actual setting parameters of the P441 relay, and its fault-detection and tripping logic were designed to mimic that of the actual relay.
- **New recommendations for modeling wind and solar plants:** We have revised our recommendations for type-3 and -4 generator models in the one-line help. The most important change is that we no longer recommend the use of 9999 pu as the negative-sequence impedance for all type-4 and some type-3 plants. The reason is that the large negative-sequence impedance caused very high terminal voltages for some faults – something that would never happen in an actual wind or solar plant. Please see Section 4.10 of the on-line help for details.
- **The distance-relay window can display up to 3 relay characteristics.** The previous limit was two relay characteristics.
- **New command to select K-factor for apparent impedance plot.** When showing operation of a distance ground relay that has multiple K-factor settings, you can select which K-factor (K0 or K1) to use in plotting the apparent impedances on the R-X diagram. The command is accessible by right clicking on the relay legend box.

## New and Updated Overcurrent Relay Curves

- **CUTLER\_HAMMER.RLY:** Added type DBU Slow E Speed Fuses.
- **ABB.RLY:** Added ABBTypical Time curves of the CWC Relay.
- **COOPER.RLY:** Added Cooper recloser type V4L & V4E.
- **See, also, the first two bullets under “Bug Fixes Since Version 11.5” below.**

## Bug Fixes Since Version 11.5

- Some fuse curves were entered incorrectly in the relay library. The minimum-melt curve was mistakenly entered as the total-clear curve, and vice versa. This mistake had no effect on plotting, since both curves are always shown together. The problem happened when the program used the total-clear curve to calculate the minimum-melt time, and vice versa. We have updated a number of fuse curves in the following relay curve files to correct the error: ABB.RLY, COOPER.RLY, CUTLER-HAMMER.RLY, EASTIMOLD.RLY, ELECTROFISI.RLY, G&W\_ELECTRIC.RLY, HI\_TECH.RLY, KEARNEY.RLY, S&C.RLY, SHAWMUT.RLY, and SIBA.RLY. You can find a list of the affected fuse curves in the Support & Download page of our web site.
- Fixed a typo in the name of Schneider Electric relay-curve file. The old file name was Scheider\_Electric.rly. The new name is Schneider\_Electric.rly.
- The Option button in the Data Browser did not work on pages for relay data.
- The option to retaining ties in the Delete in Area/Zone and Delete Tagged Equipment commands did not work correctly.
- The File | Merge File command failed when the resulting OLR file had more than 32000 buses. This should not happen because V11 has no practical limit on the number of buses.
- The voltage sag analysis command crashed the program when there are MOV-protected series capacitors in the network, and the MOV-protected series capacitor simulation feature is enabled.
- Changing the bus symbol from a bar to a dot crashed the program when the bus has one or more out-of-service lines connected to it.
- Stepped-event analysis, with the initiating event being a close-in fault on a transformer, continued even after the close-in transformer or phase shifter had tripped out.
- Simulation of a simultaneous fault caused all subsequent classical faults to have wrong ANSI X/R ratios.
- The Read Text File command did not handle the “IDS\_READMU08” error gracefully. The result is a corrupted data file. This error happened when a mutual group is missing some line-pair mutual coupling data.
- ASPEN-formatted text data files generated by the File | Export | Network Data command had errors in the switched-shunt data section.
- The program displayed wrong operating times on the one-line diagram for distance relays that are based on the RAZOA type.
- When calculating ANSI X/R ratios, the program incorrectly treated the resistance as being 0.0 ohms when the resistance is below a certain threshold.
- The breaker rating report gave wrong breaker interrupting capability value (BKR\_CAPA) for some breaker. This happened only when the 15% option for 1LG fault is enabled and the worst case turned out to be a 1LG fault. This error did not affect the breaker duty percent (DUTY\_P) result.
- The Data Browser’s sort command did not work correctly on the Bus Name column in the Breaker page.

- The program neglected to model the magnetizing susceptance, B, on the wye side of zigzag-wye transformers.
- The File | Info | Statistics dialog box did not show the total number of phase distance relays.
- When pasting a communication assisted protection scheme, the logic equation was truncated to 21 characters by mistake.
- The program hanged when showing the relay operating time on the one-line diagram. This happened when the one or more distance relays are prevented from tripping because the phase currents are below the minimum-current (fault detector) threshold.
- The program did not process the tag and memo fields in some object types correctly.
- Two commands under PFlow menu, Show Solution on 1-Line and Solution Report, were missing when the program was run as a OneLiner/Power Flow combined executable.
- The Merge File command did not work correctly when the combined OLR file contained objects with graphic coordinates that go beyond the internal drawing coordinate limits of plus/minus 32000 pixels. The program now gives you a warning when this happens.
- The program was not enforcing the current limits when MOV-protection series capacitor simulation is enabled.
- The algorithm for adjusting current-limited generators had trouble converging when (1) there are multiple current-limited generators that interact strongly with each other and (2) the generators' current limits are much than the unlimited generator contribution. We discovered that nearly all of the difficult-to-solve cases can be fixed by (1) raising the generator impedance Z1 from 0.01pu to 0.02pu, and (2) making  $Z2=Z1$ , instead of setting Z2 to 9999 pu.
- The Create Relay Test File command did not include transformer neutral current. Also the pre-fault current angle was incorrect in some cases.
- The Select Branch Outage dialog box did not always include all 3-winding terminal branches in the vicinity.
- The Merge Bus command did not always create correct graphic coordinates for equipment at the merged bus.
- The program gave the “Iteration not converged” warning in the TTY Window even when the simulation completed successfully.
- Drag/drop a new dc line between new bus(es) caused the program to crash.
- Simulating intermediate fault in a network with MOV-protected series capacitors sometimes caused the program to hang.
- Font size adjustment in the Diagram | Option dialog box did not change the vertical text font until the program is restarted.
- Exporting relay-curve graphics to WMF file with long path name (>132 characters) caused the program to crash.
- The program did not initialize the tags/memo field correctly for new objects when the “Use last object data as default” option was enabled in the Network | Options command.
- Phase shifter impedance was not re-processed after Edit and Undo of impedance-table entries.
- Annotations with the color ‘blue’ was not saved to the file correctly.
- A bug in the File | Export | Network Data for the ANAFAS Format affected the placement of the decimal point for some of the branch, generator and shunt impedances.
- Batch fault simulations of a network with MOV-protected capacitors caused the program to crash.
- Intermediate fault simulation did not always show correct ANSI X/R ratios.

- The program crashed whenever the user moved a bus that is connected to an invisible 3-winding transformer.
- DoFault() *PowerScript* function did not calculate the ANSI  $x/r$  ratio.
- The Mutual Pair dialog box did not restrict the number of digit in the edit boxes. This caused the saved value to be different from that entered by the user in some cases.
- *PowerScript* function PostGenParam() function did not reset the case-changed flag. As a result, subsequence simulations in the script program produced reports that may not be correct.
- The Edit Fault dialog box in the Simultaneous Fault simulation command did not initialize the phase connection of close-in faults correctly. This led to errors and/or program crashes when the fault is simulated
- The program crashed in some breaker rating case when the number of outages exceeded the internally defined limit.
- The New Relay Group command did not always place the new group on the branch terminal that the user selected with right mouse click.
- Fault simulation report of cases containing current-limited generators gave wrong results for the output of current-limited generators.
- The Case Comparison Program reported wrong difference result for mutual-pair data, branch name, memo field, tag field, and protection scheme logic.
- The Case Comparison Program failed to run on some Windows XP systems.
- SEL, Areva and GE relay's built-in load-region characteristics obscured the distance-relay window's load region plot.
- Logic for vendor-specific distance relay types D60G\_\_ and L90G\_\_ were based on a wrong interpretation of the COMP LIMIT parameter. Also the relay operating code (e.g., ZP1 and ZG2) on the one-line diagram was not correct.
- SEL-311G\_\_ and SEL-421G\_\_ distance relays types showed k0M and k0A parameter in the caption box even after the EADVS setting was set to N.
- The implementation of the reverse directional check logic for PG and PP loops in REL521\_\_ and REL531\_\_ relay types was not correct.
- SEL relay types logic did not correctly process floating-point parameters that were entered in the form of .xxx (without the leading zero). Additionally the ground element simulation logic did not report correct operating code (e.g., ZP1 and ZG2) on the one-line diagram when phase-'c' unit is involved.