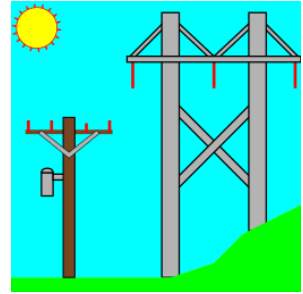# 2019 PLS-CADD Advanced Training and User Group Meeting
What's New in PLS-POLE™

Summary of changes since June 2017 User Group, covers versions 14.44-16.00

Performance

~1.3x speedup in finite element engine for pole models reduces analysis times.

Engineering

1) Added notes, hardware capacity and draw sheds fields to insulator components (ATUG17 request). Notes allow you to enter additional information regarding an insulator. The hardware capacity allows you to meet new complex NESC requirements by using the new Hardware Strength Factor. Finally, draw sheds allows you to control if weather sheds are shown.

2) Wire and Vector Loads now have a SF for Hardware column. Also increased load comments length from 100 to 140 characters.

3) Added option to use the "Hardware SF" to CAN properties. When this is selected the ".CAN" library will be saved in a new format only readable by version 15.12 and newer.

4) The PhaseRaiser Wizard is now relative to pole base rather than ground line so it can be used with H-Frames with a side slope.

5) Extended **Model/Check** base plate checks for bolt outside plate, inside hole or inside pole to round plates, round holes and round poles.

6) Added Through-Boring Strength Reduction, Distance Above Ground and Distance Below Ground to **Components/Wood Pole Material.** This derates wood pole strength around ground line (ATUG17).

7) Added "Rigid" setting to suspension insulator component. A rigid suspension insulator will be modeled with a truss rather than a cable in **PLS-CADD** FE sag-tension and may be useful for a jumper idler.

8) Fixed check of suspension insulator used in a floating deadend which could only have loads from one strain transferred to it (resulting in huge unbalanced longitudinal load applied to it) even though the FE analysis used the correct loads.

9) Fixed problem with loads on chained tension-only 2-part insulators for load cases with a dead load factor not equal to one that could greatly increase the number of iterations required to converge.

10) Fixed problem with "Overturning Moments For User Input Concentrated Loads" calculation for strain

insulators chained on the end of a suspension which could fail to include loads on the strains.

11) When manually entering loads (the "Wind loads on insulators included in Point Loads" option is NOT checked so loads are NOT coming from **PLS-CADD**) the program now adjusts suspension and strain wind loads per the "Wind/Ice Model" and "Wind Area Factor" for the current load case.

12) Now set the asymmetrical flag when saving L3 stiffness matrix for models that do have any fixed joints. This will make mid-span tap models run L4 even when the option to downgrade to L3 for symmetrical structures is set.

13) Added support for Comrod FRP poles.

14) Fixed problem where ANSI O5.1 strength reduction was applied to underground portion of pole when pole assumed fixed below ground.

15) The Width column in generic Davit and Cross Arm properties is no longer marked as optional since it is used when calculating area and section to deduct due to bolt holes.

16) Added "Calculate base plate strength usage" option to **General/General Data** so you can disable base plate check when a manufacturer supplies a plate that doesn't pass with the ASCE 48 check.

17) Added embedded **CAISSON** foundation analysis and design capability for clients who own **CAISSON** and **PLS-POLE**.

   a. Use **Geometry/Miscellaneous/Foundation Strength** to specify design options for each pole in your model.

   b. Use **Geometry/Miscellaneous/Soil and CAISSON Settings** to input the soil profile.

   c. See https://youtu.be/UYgU2SHCQOA for a video demonstration of **PLS-POLE** with Integrated **CAISSON** Foundation Analysis and Design.

   d. Note: This feature is only available for clients who have licensed **CAISSON**.

18) Now issue an error when Foundation Strength Factor is not 0 or 1 and using built-in **CAISSON** analysis as different SF values in different load cases are nonsensical.

19) Foundation usage summaries now include the maximum of foundation usages calculated from user input capacities and those calculated by integrated **CAISSON**.

20) Added a warning when the Buckling Load Method is set to "Nonlinear analysis with MOE factor" and the model has linear analysis selected.

Standards and Codes

1) Added ASCE 141-2019 wood pole design check option (essentially identical to ANSI O5.1-2017).

2) Added ANSI O5.1-2017 to the list of wood pole design checks.

3) Added EN50341-3-2:2001 (Belgium NNA) option for wind/ice loading.

4) Added EN50341-2-9:2017 (UK) Wind/Ice Model for loading. When this is selected the ".LCA" and ".LIC" files will be saved in a new format only readable by version 15.12 and newer.

Drafting and Graphics

1) Added a "Texture" column to Steel Pole, Tubular Davit and Cross Arms, Generic Davit and Cross Arms and Brace properties which allows selection between Galvanized Steel, Corten Steel, Ductile Iron, Wood, Laminated Wood and FRP as appropriate.

2) You may now pan, zoom and rotate inset views using the new **Drafting/Inset Views/Pan, Rotate, or Zoom Inset Structure View** command.

3) Added **Drafting/Annotation (User Input)/Add/Perpendicular Line** that creates line annotation perpendicular to the line between two joints.

4) Inset view tables now allow up to 1000 entries (previously limited to 200).

5) DXF text routines modified to support UTF-8 (Unicode) strings that enables symbols and international characters not part of the standard ASCII character set.

6) Improved formatting of inset reports that only have a single row of data or that don't have a footer.

7) Modified drawing of line styles for multi-pixel thick lines to more closely match pre v15.30 behavior while still maintaining spacing improvements in 15.30 that prevent dashes and/or dots from flowing together.

8) Fixed problems with display of Guy Strain Insulators in the deformed geometry view.

Interface

Watch the PLS Windows User Interface Improvements video at https://youtu.be/QZeBA8mPsSA

1) Now include a Windows Shell Extension that renders structure geometry inside Windows Explorer when displaying medium, large or extra-large icons. Additionally, structure geometry may be previewed in Windows Explorer.

2) Added Apply button to Attachment Manager Bitmap Options and DXF Options dialogs.

3) Fixed keyboard shortcuts "ctrl-tab" and "ctrl-shift-tab" for switching between next and previous window tabs.

4) Added a right click "Jump List" to the program's taskbar icon in Windows 7/8/10. The Jump List contains your Most Frequently Used and Most Recently Used models. You may also "pin" any model you like to the Jump List.

5) Added tab context menu command to close all graph, deformed geometry, and report tabs at once (right click on tab title to access).

6) Made the **File/Open** dialogs resizable.

7) Web download dialogs now have a search feature (supports comma separated search terms to search for multiple non-contiguous terms).

8) Revised collocation of joints on poles check to only be an error when joints are within 2.5cm on SAME pole. Now give warning instead of error when they are within 2.5cm on different poles.

9) Tables now check the luminance of text background color and switch to opaque draw with white background if contrast is insufficient to be readable.

10) Combo box controls modified so they no longer allow drop down lists to go off edge of screen.

11) No longer convert all file names to lower case.

12) Added **View/Toolbars/Zoom Bar** because it was missing.

13) You may now select "English" when using **Help/Download Alternate Language**. This makes it easy to return to English from another language.

14) Improvements to Setup experience including the ability to install the PLS Windows Shell Extension. This can be uninstalled using Add/Remove Programs and searching for "PLS Shell".

15) Added **File/Preferences** setting *"Auto-update model geometry tables as you enter data"* which allows you to control whether the model is live updated/checked as you edit it in a table.

16) The nonlinear debug mode now saves member/joint cut status from one iteration to the next.

17) The Project Repair Wizard dialog is now always shown on top of all other windows from any other applications you may be running.

18) Added **File/Preferences** setting to limit table and dialog maximize to size of the application rather than full screen (more efficiently uses space on 4k monitors).

19) You can now execute F1 commands directly from the **QuickSearch Toolbar**.

20) Added **Loads/Batch Import or Edit Concentrated Loads** command that allows editing of concentrated loads for all load cases in a single table so can easily copy/paste loads from a spreadsheet.

21) **View/Min. Distance Between Members** now prints coordinates of From and To points along with the delta between them in the status bar and has option to drop annotation if middle click or press enter.

22) Added **File/Preferences** setting to *"Default to Rich Text Format (RTF) when right-clicking to Save/Save-As in a report"*.

23) Added separate Foundation Usage line to Summary Results and Analysis Results reports of overall controlling usages.

24) Improved tables so that row column sizes to number of rows automatically and so that scrolling stops at the last visible row or column.

25) Improved look of table control by changing how column and row selections are drawn.

26) The PhaseRaiser Wizard has been improved to detect bad input that would result in impossible geometries.

27) Added warning when have a vang that is less than 1cm long since this can cause drawing problems if export to DXF.

28) Clarified the tool tip for base plate "bolt diameter" that this should be the diameter used to calculate the net area of the bolt.

29) **PLS-POLE** now returns more detailed information when performing a Structure Check for **PLS-CADD** and the model has errors.

30) Many more minor user interface refinements too numerous to list here.

Miscellaneous

1) Major revisions to Setup program: now also available in 64 bit, for new 64 bit only installs target "Program Files" instead of "Program Files (x86)", better handles restarting Windows Explorer when installing the PLS shell extension DLL and avoids UAC elevation prompt until necessary.

2) Setup program now has command line arguments for error logging and silent install to enable scripting of installs. Contact support@powline.com for more information.

3) Now support Acrobat Reader and Writer 2017 for display of the online help.

4) Now automatically detect the appropriate version of Adobe Acrobat to use for viewing the manual.

5) Now warn when switching schema files if the new schema file was written by a different application (like trying to load a **PLS-POLE** .sma into **TOWER**) as this will only cause trouble.

6) Fixed Windows 10 version 1803 incompatibility that prevented our software from running with this Windows update applied.

7) Fixed handling of relative joint with a distance of 0 (i.e. collocated with tip) which in some circumstances could return an error and 0,0,0 instead of the coordinates of the origin of the member.

8) Fixed problem that could result in frame stabilization being applied more than once which showed as warnings about collocated joints without joint labels in the **Model/Check** Report.

9) Vector and Wire Load Cases XML exports now include "Source File" tag which lists the source LCA/LIC file.

10) Other changes to improve stability or customer experience too numerous to list here.

Reports

1) Material Options dialog may now control whether to show/hide parts, decompose assemblies, and show/hide assemblies when listing components for structure.

2) Added output of program calculated equipment loads for transmission structures (already had it for telecom) for each load case to the Analysis Results report.

3) Added "Foundation Design Forces For All Load Cases" which is a simplified version of Joint Support Reactions for All Load Cases, but with vertical reference reversed.

4) Fixed "Summary of Guy Strain Capacities and Usages for Load Case" "Input Factored Tension Capacity" which was using Insulator Strength Factor rather than Guy SF. The % usage was correct, only the factored capacity was displayed incorrectly.

5) "Joint Displacements, Loads and Member Forces on Joints for Load Case" output now includes wind loads calculated by any SAPS (wind on individual Member) option like "SAPS", "RTE Hyp 1/2" or any of the *M methods).

6) The Diagnostic Report now includes information on any 3rd party software that is loaded into PLS-POLE by Windows. These can include anti-virus software, Windows Shell Extensions (Google Drive Sync, Dropbox), etc. Bugs in these programs have been responsible for crashes that are excruciatingly difficult to diagnose.

7) Added Moment Capacity Diagram to the Component Library Input Echo Report for Concrete Pole Properties.

Commands

1) Added **View/Display Options/Panel Cut** command which will cut everything except for the panel/face selected by the user and orient the camera to look directly at that panel.

2) Added **View/Display Options/Connection Cut** which cuts everything except a single joint and all members connected to that joint.

3) Added **View/Display Options/Ghost Mode** which shows cut members with a deemphasized texture instead of just hiding them.

4) Added entity info command for **Geometry/PLS-CADD/Insulator Link** so can click on an insulator and then jump directly to its link.

5) Added **F1/Debugging Stuff/Toggle Background Color** which switches the background color between black (best on screen) and white (best when projecting).

6) Added **File/Batch Modify** options for: wood pole Buckling Check Assumptions, "General/General Data" Project Title and Project Notes, and "Guy Strain Insulator Geometry".

7) **File/Batch Modify** no longer forces PLS-CADD to update structure data once per structure, but instead waits until all structures have been processed before updating PLS-CADD.

8) **Model/Check** will now issue an error when have a joint displacement specified on a joint that also has a Foundation Strength stiffness entered as this can't work.

9) Added **Loads/Remove LCA/LIC/EIA File References** command that allows you to disassociate a project from any loads file.

10) **Loads/Batch Import or Edit Concentrated Loads** no longer consolidates loads placed on the same joint. This allows you to more easily verify loads match what you input.

11) **File/Save** of a model will now write an empty steel shape library if the library referenced by the model is missing. This eliminates annoying error messages on subsequent opens.

Networking

1) Tested all network functionality using IPv6.

2) Now check servers @plscloud.com for availability of upgrades rather than @powline.com

3) The new "Web Upgrade Request" feature in **Help/Download Upgrade** enables requesting and obtaining upgrades directly from within the application without using email.

4) Made changes to network file access code to reduce the chance of crashing when the network unexpectedly becomes inaccessible.

5) Changed how files are uploaded to Power Line Systems for technical support to improve reliability.

6) Updated supporting libraries for Internet access. Manuals and SMA files are now downloaded exclusively via HTTPS.

7) Fixed issue that could prevent program from detecting the availability of new versions if running on Windows 7 with certain Microsoft security updates installed.

8) Improved use of automatic IE proxy server configuration. This should now work for clients who use a proxy server configuration PAC script.

Framing Manager

1) Now show and allow you to override **PLS-CADD** Insulator Link Set numbers for insulators in Framings.

2) The Framing Manager now checks and fixes insulator links in Framings prior to merging them into the main model.

3) The Framing Manager "Table" button now takes you to the row that corresponds to the current selection.

4) Increased maximum number of framing elements from 16 to 32 to support complex distribution structure.

5) Added entity info command to select a framing element in the Framing Manager.

6) The Framing Manager now works with Guy Strain Insulators (previously Framings could have GSI, but they didn't get applied into new models).

7) Fixed problem where Framing Explode failed to clear Insulator Link Framing Source field that then resulted in Phase, Dead End and Set Description fields being locked. Geometry/PLS-CADD/Insulator Link..." now clears stranded Framing Source fields which could exist if Framing was Exploded in version 14.55 to 15.05.

8) Framing elements now automatically rename their constituent elements if they duplicate the label of an element already in the model. So, you can now use a Framing with a davit arm named "arm" with a different framing that has a crossarm named "arm".

9) When you create a Framing, **PLS-POLE** now clears any site specific structure information to avoid any subsequent File/Backup from prompting for the site specific structure source file.

Web, Components, & Examples

1) New Website at https://www.powerlinesystems.com/
    a. Added "Mobile Substation modeled in **PLS-POLE** for evaluation of line clearances. Example courtesy of Drew Bertke of Ampirical Solutions" to the Hall of Fame at https://www.powerlinesystems.com/plspole
2) New Videos
    a. **CAISSON** Integrated in **PLS-POLE** https://www.youtube.com/watch?v=UYgU2SHCQOA
    b. PLS Windows User Interface Improvements https://youtu.be/QZeBA8mPsSA
3) Technical Notes
    a. Overview of Power Line Systems software and Grid Integrity at https://www.powline.com/technotes/PLS_Grid_Integrity_Executive_Summary_Overview.pdf
4) Component Libraries
    a. PUPI Fiberglass Crossarm Library Updated September 2018
    b. PUPI Fiberglass Brace Library Updated April 2018
    c. DIS-TRAN Steel LLC Steel Pole Library Updated August 2018
    d. Nello Steel Pole Library Updated June 2018
    e. Trinity Meyer Steel Pole Library Updated July 2018