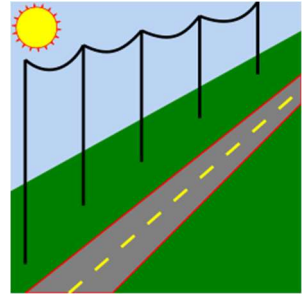


2024 PLS-CADD Advanced Training and User Group Meeting

What's New in PLS-CADD™



Summary of changes since June 2022 User Group Covers changes in Versions 17.50 – 20.00

Projects saved in version 20.00 are readable in versions 18.01 and newer unless:

- Version 18.04 and newer when structure wind/ice model of EN50341-2-18:2016N or EN50341-2-18:2016E (Swedish NNA) selected.
- Version 18.08 and newer when more than 200 automatic sagging criteria defined.
- Version 18.11 and newer when using Notes or Keywords in Attachment Manager.
- Version 18.12 and newer when using EN50341-2-15:2019 (Netherlands NNA) or User Defined Feature Code Groups.
- Version 19.04 and newer when using Line Specific Alignments.
- Version 19.11 and newer when using Grid View specific structure labels.
- Version 19.12 and newer when using hatch filled annotations.
- Version 19.13 and newer when using structures with lambda, double pin, or double suspension insulators.
- Version 19.13 and newer when using more than 200 cable tensions for "Criteria/Cable Tensions..."
- Version 19.15 and newer when using Line-Specific Alignments.

ATUG 2022 Requested Features

1. Added a "Draw Vertical Contours" option to **Sections/Electric/3D EMF Along Line** to draw a vertical cross section contour EMF plot anywhere in the project.
2. Added F1 menu command "Save separate Wind 360 LCA File" to store the LCA file containing all tested wind directions for structures analyzed with a MAX Global Wind load case.
3. Improved difference reports for Criteria Weather Cases, Structure Load Cases, and Feature Code to better show inserted or deleted rows.
4. Added **Sections/Electric/Save 3D EMF Contour TIN File...** and **Sections/Electric/Load 3D EMF Contour TIN File...** to save and restore 3D EMF plan contour data.
5. Added **View/Pan, Zoom & Rotate/Rotate to Plan Angle** command to rotate 3D view to plan view angle at current position and orientation.

6. Added button to **Criteria/Structure Loads (method 4)...** dialog to view the "Weather Cases" table.
7. Added "Use Dark Mode for Reports" option in **File/Preferences...** to display reports as white text on black background.
8. Improved annotations to support multiple annotation copy/paste and ability to move 2D dimension annotation points.
9. Added "Prepend" command to table context menu, which will prepend clipboard text to the current text in the selection.
10. Added 'User Defined Feature Groups' to **Terrain/Feature Code Data/Edit...** which can be used when selecting sets of feature codes to use for certain reports.

Reliability, Usability, & Performance

1. Updated software components for improved security.
2. No longer support Windows 7 or Windows 8.
3. Version 19.01 no longer saves files compatible with software versions earlier than 17.50. Version 20.00 will no longer save files compatible with versions earlier than 18.01.
4. Notify when saving files to an updated file format version. Notification includes which software versions can read the file(s) and what features require the new version.
5. Added a setting in **File/Preferences...** to automatically check in your license when closing out of all instances of PLS-CADD on your computer. This will help users who switch between remote work and office work who may forget to "Switch Computers" on the active computer.
6. Detect when Project Report is getting large and prompt user to archive it to the project's Reference Manager and start a new one. Very large Project Reports can take several seconds to load. This option can be configured through the "Archive Project Report..." setting in **File/Preferences...**
7. Error, Warning, and Informational message dialogs updated to a standard format with a checkbox option to suppress related messages.
8. Implemented Binary Cache for DXF and SHP files to greatly speed up loading those files if they have not changed (can be 100x faster depending on file).
9. Reduced the amount of memory required for TINs by ~11%
10. Multi-threaded **Lines/Reports/Wire Clearances...** (~2x faster), **Sections/Electric/Lightning Protection Calculator...** (~8x faster), and certain low-level survey point calculations (~5x faster).
11. Multi-threaded calculating Structures Loads which speeds up L4 FE sag-tension up to 5x, L3 up to 4x, and L2 up to 2x. Speedups are dependent on number load cases, cores, and available memory.

12. Usability improvements to the list control in **Drafting/Attachments (Raster and Vector)/Attachment Manager...**

Alignment & Terrain

1. Added context menu command "**Structure Alignment Options/Swap Structure Alignment...**", to move a structure to a different nearby alignment.
2. Modified **Terrain/Alignment/Move P.I.** command behavior so only the PI currently snapped to is moved when two PIs are co-located.
3. Added "**Toggle current view alignment/PI display**" to context menu when snapping to an Alignment.
4. Added **Terrain/Alignment/Line Specific Alignment Configuration** command to enable and configure line-specific alignments. This is a project level setting which can be easily toggled for backward compatibility.
 - a. Added "Alignment" tab to **Sections/Display Options...** where Line Specific Alignments can also be enabled or disabled.
 - b. Added option to duplicate PIs when copying a line model using the new Line-Specific Alignments option.
 - c. Added option to delete PIs when deleting a line model using the new Line-Specific Alignments option.
5. Added **Terrain/Alignment/Table Edit Alignment** to manipulate your alignment via a table interface. It supports changing coordinates, resorting PIs, adding/removing PIs, and splitting/joining alignments, without changing the position and orientation of structures.
 - a. Added ability to select and reorder all PIs in an alignment segment to **Terrain/Alignment/Table Edit Alignment**.
 - b. Allow multi-select and delete PIs in **Terrain/Alignment/Table Edit Alignment**.
6. Added checkboxes for Plan and 3D Views to 'Add Above Label to PI Leader Text in' in **Terrain/Alignment/Display Options for P.I., Alignment, Right of Way...**
7. Now remember ground TIN display option settings from previous project save.
8. Updated **Terrain/TIN/Set Z of PIs, Survey Points, XY-based Structures, and/or Polygonal Constraints to 0...** and **Terrain/TIN/TIN Z Interpolation for Z=0 PIs, Survey Points, XY-based Structures, and/or Polygonal Constraints...** to include an option for visible survey points.
9. Added **Terrain/TIN/Create Surface TIN** to create a TIN mesh from any selected feature codes; not restricted to ground points. Also added 'Check clearances to Surface TIN' option to

Lines/Reports/Survey Point Clearances... and **Lines/Reports/Clearance to Surface TIN** to check clearances to a Surface TIN.

10. Updated the report header in **Terrain/TIN/Clearance to TIN...** to include "Show only clearances which are less than" value if it is set to something non-zero.
11. Added **Terrain/TIN/TIN Manager** which manages display options and saving and loading of ground, surface, wire surface, lightning protection, and EMF TINs in one place. The TIN Manager command has replaced the **Terrain/TIN/Display Options...** and **Terrain/TIN/Isoclearance Lines/Clearance TIN Display Options...** menu commands in version 20.00.
 - a. **Terrain/TIN/TIN Manager** has 'Add', 'Remove', and 'Hide All TINs' buttons to control TINs of different types (ground, vegetation, lightning protection, wire surface).
 - b. Added a "Hide Selected TIN" button to **Terrain/TIN/TIN Manager** to only hide the selected TIN.
 - c. Added 'Copy Selected TIN to New Surface TIN' to **Terrain/TIN/TIN Manager** which copies a TIN of any type to a Surface TIN.
 - d. Added Details pane to **Terrain/TIN/TIN Manager** which displays information about the selected TIN file and the dialog settings used to generate it.
 - e. Supports changing the contour line and label intervals for EMF contour plots through **Terrain/TIN/TIN Manager** without having to rerun the 3D EMF calculations.
 - f. Only show 'Ground ISOTIN' in **Terrain/TIN/TIN Manager** if the isoclearance data is present and when clicking 'Remove TIN' while the ISOTIN is selected, only delete the isoclearance data without affecting Ground TIN data.
12. TINs managed through **Terrain/TIN/TIN Manager**, including Vegetation Violation, Wire Surface, Surface, Lightning, and EMF TINs, are now saved and loaded with the project and included in backups, PLS-GRID check-ins, and difference reports.

Criteria, Codes, and Structure Loads

1. **Criteria/Automatic Sagging...** and **Criteria/Cable Tensions...** tables can now grow to greater than 200 entries.
2. Display criteria notes when selecting criteria files in common open dialog.
3. Added the following codes and updates to codes:
 - a. "EN50341-2-15:2019 (Netherlands NNA)" options for Wind Height Adjust, Gust Response Factor and Structure Wind/Ice Model.
 - b. "EN50341-2-18:2016" Normal and Extreme Swedish NNA Wind/Ice Loading Methods to

Criteria/Structure Loads (method 4)...

- c. EN50341-2-15:2019 now calculates an insulator GRF, Gc, using "sum of adjacent spans" for Lm.
 - d. EN50341-2-5:2019 CProb factor for lines with a design life less than 50 years now applied to wind pressure instead of velocity.
 - e. IEEE 738-2023 Thermal Rating code to **Sections/Thermal Calculations (IEEE, CIGRE and TNSP)**
4. Added automatic option to "Structure Group Rules" for grouping PLS-POLE structures based on whether they are direct embedded or not. This can be found in the Structure Groups in **Criteria/Structure Loads (method 4)...**

Drafting and Attachments

1. Drafting menu options for various displays moved to new menu **Drafting/Display Options...** including Black & White, Show Structure Compass, Show Cable Attachment Points, Show Stringing Direction, Show Set and Phase Labels in 3D Views, Show Circuit and Phase Labels in 3D Views, Show Structure and Section Check Bitmaps, Show Embedded Portions of Structures, Show Insulator Counter Weights, and Show P&P Sheet Rectangles. Added two new display options to the program found in this menu as well:
 - a. Show Alignment Direction: draws an arrow on the center line showing the direction of each alignment. There is also now a check box to enable this in **Terrain/Alignment/Display Options for P.I., Alignment, Right of Way...**
 - b. Show Line Indicator on Pls: to toggle whether vertical lines are drawn at Pls in the Profile View.
2. Changed **Drafting/Display Options/Show Set and Phase Labels in 3D Views** and **Drafting/Display Options/Show Cable Attachment Points** to display cable attachment point symbols and set and phase labels at the ends of strain insulators (where the wire attaches to the insulator).
3. Added **Drafting/Span Length Text Position/Move...**, **/Reset...**, and **/Reset All...** to adjust span length text position in P&P Sheet Profile View.
4. Added context menu command "Toggle Ahead Span Label Display" (accessed by left clicking on back structure) for turning on/off span label display in profile and P&P Sheet profile views.
5. Added %LeftWindSpan and %RightWindSpan prefix/suffix options to customized structure labels in **Drafting/Structure and Section Labeling/....**
6. Added option to 'Use feature code (number) as layer name' for survey point symbols in the **Drafting/Text Size, Line Width, Style, Color and Layer...**
7. Added 'Show Clearance Line' option to Inset Plan Detail and Inset Phasing Diagram views.
8. Context menu command, "Auto Add Dimension Lines for Inset View", when snapping to structure inset

views to add program-generated dimension lines like the ones in PLS-POLE and TOWER.

9. Added Notes and Keywords columns to **Drafting/Attachments (Raster and Vector)/Attachment Manager...** Can add Notes or Keywords to any attached file using the Table button or context menu command.
10. **Drafting/Attachments (Raster and Vector)/Attachment Manager...** now has a "Zoom To" context menu option to zoom all views to that attachment.
11. Added '3D View' option to "DXF Overlay Options" dialog to control whether a DXF or SHP file displayed in the 3D View independently of the Plan View.
12. Added "Lock Aspect Ratio" option to Bitmap Options dialog in **Drafting/Attachments (Raster and Vector)/Attachment Manager...** to preserve the image's aspect ratio when one dimension is changed.
13. Added the option to specify the station range for **Drafting/Attachments (Raster and Vector)/WMS**.
14. Updated WMTS server list and added more MapBox layers to the PLS WMTS Proxy service.
15. Now support hatches and splines in DXF attachments as well as custom hatch support to polygon and ellipse annotations.

Electrical

1. **Sections/Electric/3D EMF Calculator...** now has an option to calculate EMF along the center line for each span and then do a cross section at the maximum EF/BF station from those center line measurements.
2. Changed contour draw options in **Sections/Electric/3D EMF Calculator...** from radio buttons to check boxes so it is possible to generate both Electric and Magnetic Fields at once.
3. Added Audible Noise calculation based on EPRI and BPA methodology in **Sections/Electric/Audible Noise Calculator...**

Importing, Exporting, and Coordinate System

1. Updated to PROJ 9.4.0, which includes many newly integrated EPSG coordinate system definitions.
2. Made the automatic selection of the current coordinate system in **Terrain/Coordinate System/Define** tolerant of changes in the zone description.
3. Added EPSG 9377 (MAGNA-SIRGAS / Origen-Nacional) definition to "custom" proj file.
4. **File/Export/KMZ (Google Earth)...** now has a checkbox option to include annotations in the export.
5. Added "Exclude attachments, survey points, and TIN" option to **File/Export/DXF...**
6. Added support for Lat/Long coordinates in LAS/LAZ and Shape (.SHP) files when importing points.

7. Added a station range option to **Terrain/Edit/Merge Points from External File/Merge Points from Internet...** when importing points along the alignment.
8. Added an iTwin synchronization option when doing an Add Project or Check-In Project to PLS-GRID.

Materials

1. **Structures/Material/Batch Edit Structure Specific Material** opens a table with all site specific material for each structure in the line.
2. **Structures/Material/Batch Add/Remove Structure Specific Material** to add or remove specified material to the site specific material for the selected structures.
3. Bill of Material reports can now account for guy wire and structure cable wire lengths if they use part stock numbers using the new "Quantity From Cable Length" rule and saved with v17.50 PLS-POLE or TOWER.
4. Include the total number of parts and assemblies at the end of the **Structures/Material/Parts and Assemblies File/Report Parts and Assemblies**.
5. Updated **Structures/Material/Batch Edit Structure-Specific Material** and **Structures/Material/Batch Add/Remove Structure-Specific Material** commands to allow floating point quantities.

Merging Projects

1. New command **Lines/Merge Projects...** replaces **Lines/Load DON File or Merge Projects...** and includes significant improvements in merging alignments.
2. New 'Merge' button in **Lines/Edit...** that creates a new line model based on selected structures and sections from two existing line models. This improved method will eventually replace the older **Lines/Merge...** functionality.
3. **Lines/Load DON File or Merge Projects** has a new dialog for selecting what to merge and displaying differences between the projects. It also now includes loading the criteria and improved handling of Reference Manager and Attachment Manager files.
4. Allow **Lines/Merge Projects...** when one project's coordinate system is not defined, after warning user and asking if they want to continue using the defined coordinate system.

PLS-CADD/Lite

1. Added **Context/Entity Info/Move Span End Attachment Point** command to graphically change the horizontal projection, vertical projection, and azimuth of the selected wire.
2. Added **Context/Entity Info/Rotate Structure** command to graphically change the 'Bearing of Transverse Axis'.
3. Added **F1/Custom / Under Development/Convert Lite Model to PLS-CADD XYZ Project...** which saves a PLS-CADD/LITE model as a PLS-CADD XYZ project which can use all the standard PLS-CADD functionality.
4. Updated default criteria files to 2023_nesc_heavy_grade_b_only.cri from 2012_nesc_heavy_grade_b.cri for LITE Wizard.
5. Added **Criteria/Structure Clearances** menu command to PLS-CADD LITE which can be used by **Sections/Structure Clearances...**

Reports

1. Added the ability to save and load report settings through the .RPS file.
2. Added **Lines/File Reference Check** to show missing file references. Includes errors generated by not having the necessary license capabilities to move/check structure files.
3. Added **Lines/Reports/Seasonal Rating** command that helps automate the calculations required by FERC order 881.
4. Added **Criteria/Damper Analysis...** and **Lines/Reports/Damper Analysis Report...** to gather the information damper manufacturers need to perform a damper recommendation.
5. Added **Structures/Available Structure List/Component File Report** which lists every component file each Method 4 structure uses and which component files duplicate another.
6. Updated report settings to utilize a structure pick list.
7. Updated Danger Tree Locator report with "Canopy TIN" option in the Work Site tab which generates a smoother TIN over the top of the violation points. Also added hidden columns for Longitude and Latitude to "Vegetation Analysis Report"
8. Updated Wire Clearances Report to include bundle radius in jumper clearance calculation, an additional Required Separation Option so users can specify required separation when wires share 0, 1, or 2 structures, and calculating the required clearance when checking the entire span, vertical only, for crossing wires as twice the sag of the lower wire to help with checking AS/NZS 7000:2016 requirements.

9. Updated Structure Clearances report with an Advanced tab. The Advanced tab allows the user to specify different clearances for particular voltage and weather case combinations.
10. Updated Structure Staking Report to include "Attached Pole Label" and "Length to Pole Hub" columns for guy wires attached to pole and "Ground Line Diameter" column for poles if the poles are saved with PLS-Pole Version 17.50 or later.
11. Updated Galloping Ellipses to flag NG results when invalid 'Conductor Span Parameter' values are calculated.
12. Updated Structure Overview Report Configuration Dialog in **Structures/Check...** to include a setting for the "Minimum Text Height" to ensure auto-sized text is not too small.
13. Updated "Wire Load Induced Ground Line Moments For Single Pole Centered At Structure Origin" with reversed sign for Longitudinal Moment so that clockwise is positive, matching PLS-POLE and TOWER programs.
14. Updated Survey Point Clearance report with the following enhancements:
 - a. Add checking clearance to jumpers; when checking jumpers, show controlling case for every jumper and display structure phase of first connection. Also enabled checking clearance to the Ground TIN for jumpers and separator cables.
 - b. Added columns for "Cable File", "Phase Labels", and "Circuit Labels" to 'Terrain Clearance by Span' report. Additional columns are hidden by default.
 - c. Add special case for usage calculation: when distance to wire is zero, report a usage of 200% unless requires clearance is also 0, then report 0%.
 - d. Added an option in the Report and Markers tab to show separate results for spans from the same back structure to different ahead structures.
15. Updated Thermal Rating Report with a Radial and Rectangular options for checking clearances in addition to the legacy vertical option. Also added "Edit Feature Code Table" and "Edit Feature Code for Ground or TIN" buttons to Thermal Rating dialog.
16. Updated **Lines/Reports/Structure Usage...** report to include a column for "Analysis Type" to show if a Method 4 structure is using linear or nonlinear analysis.
17. When using **Structures/Check...** the Summary Report and Analysis Results now include full schema tables and embedded images from PLS-POLE and TOWER which support navigation options, table views, and customizations.
18. Added right click "Aggregate <schema name> Across All Load Cases" command for any report schema that has "Title Detail" defined (e.g. a load case name) and where the report contains more than one of

these schemas. Command presents a single large table with all schemas appended and load case inserted as the first column.

Sections

1. Now support the scroll wheel and the '+'/'-', 'up'/'down', 'left'/'right' arrow keys to **Sections/Slip and Clip...** dialog, such that they will simulate incrementing/decrementing the buttons your mouse is currently hovering over.
2. Added 'Equalize Tension' button to **Sections/Slip and Clip...** dialog.
3. Added option to **Sections/Concentrated Loads/Concentrated Loads Automatic Placement...** to place loads "along the wire" instead of the existing behavior which uses horizontal distances. Concentrated Loads Automatic Placement also supports circuit label and discontinuous structure selections.
4. Added a report option to **Sections/SAPS Label Options...** which includes the information shown by the SAPS labels. Also updated SAPS labels to draw on the back span side of Dead End structures.
5. **Sections/Swap Attachments** in the 3D View will now display the label at the attachment point and, for colocated attachments, provide a pie chart graphic displaying the different wire attachments available.
6. Added an option to swap phases when rotating structures with horizontal sets by more than 170 degrees in **Structures/Staking Table**.
7. Added new command **Sections/Autosag All...** to autosag all sections.
8. Updated **Sections/Add Graphical...** to use set numbers of + /- 10 more consistently when connecting across dead-end structures. Also added options 'Automatically place flexible jumpers on dead end structures' and 'Attempt to untangle crossed wires by swapping attachments'
9. Added 'ACSS/TW' to the 'Cable Type' selection for **Sections/Cable Files/Edit Existing Cable File....**
10. Added pentagonal shape as a cable bundle option (pointy end goes down).
11. In **Sections/Display Options...** when using the 'Load Case Display' there is now an option for 'Display wind direction arrows' which will graphically draw arrows at base of the selected structure showing the direction of wind for that load case.

Structures

1. Now support phase specific counter weights in **Structures/Modify**.
2. Now export survey points near structure to PLS-POLE and TOWER so they can display them.
3. Now ask user if they want to edit the structure without loads (so they can get structure LiDAR) or if they

want to continue with loads last saved with the structure when there are no loads applied.

4. **Context/Entity Info/Save Copy of Structure as Method 1/Multiple Save** now adds newly created structures to the available structure list.
5. Added **Structures/Automatic Spotting/Fit Pole Lengths To TIN...** which creates site specific PLS-POLE models (currently for wood pole only) with optimized pole length and embedment according to the project's ground TIN.
6. **Structures/Available Structure List/Add or Delete Structure...** now automatically includes the parent and seed structures (if any) for each structure selected by the user. This will reduce the number of broken structure references that clients encounter.
7. For customized structures, added an option to fix invalid base structure references to **Lines/File Reference Check, File/Auto-Organize Project...**, and **File/PLS-GRID/Add Project**.
8. Added **Structures/Customize Structure/Clear Site Specific Flag for Structure Range** that uncustomizes M1, M2, and M4 structures in the range so that users have a way to remove "customized from" file references which may refer to structures that no longer exist. Asks user if they want to clear the flag from all structure in available structure list which covers all line models and unused structures.
9. Added **Structures/Customize Structure/Framing/Batch Add** to add a frame set to multiple poles in a PLS-CADD model.
10. Added **Structures/Alignment/Convert Structure(s) to Station-based...** and **Structures/Alignment/Convert Structure(s) to XY-based...**, and made the entity-info versions operate on the selected structure, without bringing up the dialog.
11. **Structures/Automatic Spotting/Optimum Body and Leg Extension Selection** now allows you to enter the number of sub-optimal solutions to report on for each structure location. Sub-optimals have acceptable reveal but are not the lightest solution. Factors outside of PLS-CADD such as scheduling, or material availability may make a sub-optimal solution more desirable.
12. **Structures/Automatic Spotting/Optimum Body and Leg Extension Selection** now completely ignores configurations with errors even if they are the only way to get leg coordinates for an unequal leg configuration. Now set weight of invalid configurations to zero to make it obvious that it is invalid.

User Interface

1. New enhanced graphics including high DPI improvements.
2. Now display "SAPS FE Level" indicator with "L2", "L3" or "L4" instead of Num Lock in the Status Bar when SAPS is enabled and have an applicable project open.

3. Open **Criteria/SAPS Finite Element Sag-Tension...** when the SAPS status bar indicator pane is double-clicked.
4. Open **File/Preferences...** when the units status bar indicator pane is double-clicked.
5. Added the following **File/Preferences...** options
 - a. Save backup files with a .PLSBAK extension.
 - b. Support dark mode for images inserted into reports.
 - c. "Minimum number of lines displayed for status bar text".
 - d. Reverse direction of zoom with scroll wheel.
6. **View/Measure Distance/Between Points** in the 3D View, modified condition so we can measure a distance without all 3 angles being multiples of 90. Allow measurement as long as we are orthogonal to some plane, even if there is a rotation about the 'line of sight' axis.
7. Added new command **View/Measure Distance/Along Path** to measure distances with more than one line segment.
8. Added button to **View/Pan, Zoom & Rotate/Virtual Profile** for graphically selecting the line used to generate the virtual profile. No longer need to go to **View/Measure Distance/Between Entities** first.
9. Now save 'Snap to Grid Settings' inside **View/Entity Info Snap Settings...** to PPS file.
10. Added a scroll bar to the text input field in Edit Annotation dialog.
11. Enabled Cut and Clear commands when just a single cell is selected in UI tables.
12. Now warn about potential unsaved changes whenever you hit the ESC key in a dialog containing a table with changes.

Miscellaneous

1. Added 'New' button to **Lines/Edit...** which creates a blank line model.
2. Added Notes and Keywords columns to **Lines/Reference Manager** file list.
3. **File/Auto-Organize Project...**, **File/PLS-GRID/Add Project**, and **File/PLS-GRID/Check In Project** now support copying files referenced in Part/Assembly Library.
4. Added **Terrain/Automatic Model Builder (AMBER)...** which automatically builds alignments, places Method 1 structures, and strings conductors using classified survey points.
5. Added support for three new insulator types: Lambda (Inverted V), Double Pin, and Double Suspension

Web & Examples

1. New Videos

- a. FERC Order 881 - Ambient Adjusted Ratings in PLS-CADD Video:
<https://www.youtube.com/watch?v=MJEYolIEp4>
- b. PLS-GRID Overview - https://www.youtube.com/watch?v=b7_4U3VLhcE
- c. PLS-CADD Project Templates with PLS-GRID - <https://www.youtube.com/watch?v=VlrDun9kgcM>
- d. Customize Structures - <https://www.youtube.com/watch?v=Q1AQ4D95r0w>
- e. Positioning Span and Structure Labels - <https://www.youtube.com/watch?v=bZAwDz0eFPw>
- f. Report Settings (.rps) - https://www.youtube.com/watch?v=RVu9_yFsluA
- g. Automatic Pole Embedment Optimization - <https://www.youtube.com/watch?v=TgoDyfTe9aw>
- h. LiDAR Survey Data in PLS-POLE & TOWER Models -
<https://www.youtube.com/watch?v=8JBkqxtYFdU>
- i. PLS-CADD TIN Manager - <https://www.youtube.com/watch?v=t3GdFu4f70o>
- j. Batch Modify Site Specific Materials - <https://www.youtube.com/watch?v=9dbL2qDdpkQ>
- k. XY & Station Based Structure Conversion Commands & Advanced Alignment Modifications -
<https://www.youtube.com/watch?v=Otc1oU0FRw8>
- l. Swap Attachments Improvements - https://www.youtube.com/watch?v=zZvb0QAW_E

2. New Technical Notes

- a. Thermal Rating in PLS-CADD: <https://www.powline.com/technotes/ThermalRating.pdf>
- b. Finite Element Analysis in PLS-CADD: https://www.powline.com/technotes/Finite_Element_In_PLS-CADD.pdf
- c. Preparing for Line Optimization in PLS-CADD (updated):
https://www.powline.com/technotes/Line_Optimization.pdf
- d. Augmented Reality with PLS-GRID: https://www.powline.com/technotes/PLS-GRID_Augmented_Reality.pdf
- e. Application of NESC Insulator Requirements in PLS-CADD, PLS-POLE, and TOWER -
https://www.powline.com/technotes/NESC_Insulators.pdf