2009 PLS-CADD Advanced Training and User Group Meeting
July 15th 2009

Recent PLS-CADD Developments

This list includes some of the more significant PLS-CADD improvements made since the 2007 user group meeting in San Diego.

Operating systems and memory management

1) Added support for Windows Vista (version 8.16) and Windows 7 (version 10.14). Please see http://www.powline.com/products/vista.html for information on new locations for files and folders.

2) Now shipping 64 bit edition of PLS-CADD.   Requires Windows XP x64, Windows Vista x64, Windows 7 x64. Theoretically can handle over 2 billion survey points. Performance degrades severely when points do not fit in RAM creating a practical limit of 10-20 million points per GB of RAM. See http://www.powline.com/products/memory.html for point limits on 32 bit editions.

3) Can now create and restore .BAK files in excess of 4GB (essential for some 64 bit projects and even 32 bit projects with high resolution color imagery)

4) Image memory management has been automated. This eliminates the desired pixel size and dynamic resize inputs that some struggled with in earlier versions. Program continually adjusts resolution for each image to minimize memory usage while retaining optimum display and print quality.

5) Can now compress .XYZ and .TIN files (File/Save As with "Save as type" set to "Compressed XYZ Files"). Typically results in 4:1 compression ratio. Time to save can increase substantially but time to open may be reduced on slow network drives.

Web Site, Online Library and Documentation

1) New Online library additions:
    Brugg OPGW cable files www.powline.com/files/cables.html
    Southwire cable library www.powline.com/files/cables.html
    Hughes brace library www.powline.com/files/pls_pole.html

2) New and Updated tech notes:
    Vegetation Management in PLS-CADD www.powline.com/vegetation/dangertree.html
    Line Optimization www.powline.com/products/optimization.html
    Design Codes www.powline.com/products/designcodes.html
    Importing USGS DRGs and DEMs www.powline.com/products/usgs2.html

3) New English manuals for version 10 of PLS-CADD, PLS-POLE and TOWER (Help/Check for Updated Manual). Revised Spanish TOWER manual now available with PLS-CADD and PLS-POLE following shortly.

DXF & Shapefiles

1) Added support for attaching Shapefiles (ESRI geospatial vector format, .shp,.shx,.dbf extensions)

2) Added ability to search for specified text within DXF and Shapefile attachments.

3) Improved fidelity of DXF displayed in PLS-CADD (POLYLINE+LWPOLYLINE width codes, entity specific line type scale, MTEXT entity with font and text style override...)

4) DXF export text clipping and sizing modified for more accurate representation of what you see in PLS-CADD.

5) DXF output modified to prevent rejection by Microstation XM.

6) File/Export/DXF now has a "medium" "Detail to include in DXF" option. Low and medium result in lower fidelity but may allow easier text editing in AutoCAD (similar to what was done in versions before 9.28). Standard and high use the more accurate "aligned" text method.

7) Drafting/Text Size, Line Width, Style, Color and Layer now has a "Use survey point feature description as layer name for survey point symbols, comments and labels" option. Results in a DXF file where CAD user can easily enable or disable display of each feature code.

Drafting and Other Graphics Functions

1) View/Display Options/Sheet View Structure & Section Labels now has options to place section label at midpoint of each section as opposed to making a block of labels for all sections on the page.

2) View/Display Options/Sheet View Structure Labels and Profile equivalent now have option to label displayed sags.

3) New Drafting/Inset Plan Detail/Add and Edit commands allow insertion of plan or 3D view port on P&P sheets. View port scale, longitude, latitude, title, wire, structure and guy anchor display are all under user control.

4) Cross section view '/' and '*' keys now jump to next and previous mid span points.

5) New Drafting/Scales 'Label elevations at breaks in profile' option enables display of elevation labels at profile elevation breaks.

6) Terrain/Clearance line dialog now has ability to draw "Wire Clearance Line" and "Profile below wire".

7) Added support for panning, zooming and rotating views with 3DConnexion input devices like the SpaceNavigator.

8) Vanishing point mode made easier to control with new options for rotation about selected structure, selected origin or observer (View/Scales, Rotations, Panning/Vanishing Point Mode for 3D view, previously in F1 menu)

9) Added support for Windows 7 multi-touch

10) Drafting/Attachments/LiDAR Video Setup now has options for Aerotech, Flimap, Network Mapping, Terra Remote Sensing, Wire Services and Geodigital image/video player integration.

Improved report interface and integration

1) Many reports now have a "Goto Structure #" menu option when right clicking on structure number in the report.

2) Added "View this location in Google Earth" option to the middle click menu (middle click or hit enter while highlighting a survey point).

3) Added "KML Export" option to right click menu for selected reports. This enables reports to be read into Google Earth and other KML compatible programs like ArcGIS Explorer. Reports supporting KML Export include the Vegetation Analysis Report, Thermal Rating Report, PI Report, Construction Staking Report, Leg and Guy Extension Report, Terrain Clearances by Span Report, Structure Coordinates Report, Terrain Clearances by Survey Point Report.

Galloping & Offset Clipping

1) Galloping ellipse calculations improved in the following ways:
    a) New section in report showing percent of area overlapping with other ellipses.
    b) Galloping ellipse graphics now display set and phase numbers and color code ellipses according to violation status.
    c) Galloping ellipses can now be displayed as markers in 3D view.
    d) New Cigre Report 322 option.
    e) Added galloping safety factor input.
    f) Routines no longer compare ellipses for spans with different start and stop structures against each other (taps no longer compared to main spans).
    g) Added options to do wind from left/right/both.

2) Offset clipping report now operates on range of temperatures instead of a single temperature.

3) F1/ Custom / Under Development / Finite Element Offset Clipping (experimental, under development)... is now enabled and can be used to compare Winkelman offsets against offsets computed using PLS-CADD finite element sag-tension.

Material

1) Added an option for user defined columns in assemblies (see Structures/Material/Setup). These columns may be imported and exported to ODBC.

2) Reworked user interface to allow for copy/pasting of assemblies, fewer clicks to edit, etc. - new assembly editor allows right clicking on a stock number to add it to an assembly.

3) Added Structures/Material/Sort command so can sort by stock number of part description.

4) The Part and Assembly Report is now customizable and can be exported to XML.

Thermal rating & clearance reports & danger tree

1) Danger tree locator detailed point report modernized and can now be output to report window, text file, comma separated value file or XML file.

2) Thermal rating report, survey point clearance reports and danger tree locator reports made more stand alone through inclusion of required clearance and relevant weather case listing. Also added option to include small plan, profile and cross section graphics within reports.

3) Danger tree locator detailed point report now has new optional columns that are by default hidden (XYZ coordinates of closest point on wire, distance from back structure, controlling weather case and condition...). Use View/Edit Customizations/Tables to enable display.

4) Added option to draw 'Clearance box markers' to graphically illustrate the 'no wires allowed' zone around a surveyed feature. Clearance box is also highlighted when selecting a point using Terrain/Clearance.

5) Criteria/Survey Point Clearances and Danger Tree Locator now have new option to check survey point clearances to full range of wire positions along an arc between left and right blowout positions (older versions checked left and right blowout positions, but not in between).

6) Lines/Reports/Danger Tree Locator now has option to measure radial clearances rather than using separate horizontal and vertical clearances.

7) "Vegetation Analysis Report" no longer excludes points that are more than "Max Offset for Profile View" from centerline and those in the dead zone outside a line angle. It now considers all points that are within the specified offset to wire.

8) Sections/Thermal Rating Calculations now has an option to do calculations using CIGRE Brochure 207 method in addition to previously existing IEEE 738-2006 method. Includes conductor core temperature calculation (equations 9 and 10, page 4 of Cigre Brochure 207) .

9) Added options to control order in which sections appear in reports (Criteria/Default Wire Temperature & Condition, Section Sort Order).

Terrain / Survey data

1) Terrain/Edit/Sort XYZ Points now has a "Sort to Optimize Redraw Speed" option that significantly improves survey point symbol drawing speed and point selection speed.

2) Added Terrain/TIN/TIN Interpolation of Z for Non Ground Survey Points. Converts above ground points like wire and vegetation shots specified with X,Y,Z into points specified as X,Y,Z (of TIN ground), H (height above ground).

3) Terrain/Survey Data Display Options allows limiting display to list of feature codes, range of station, range of offset and height above TIN.

4) Added Terrain/Edit/Change Feature Code/Search & Replace. Even has options to restrict range of heights and offsets considered.

5) Added View/Measure Distance/Between Survey Points command.

6) Program now keeps track of number of inactive survey points for each feature code and displays these in feature code dialog and feature code selection dialog boxes.

Structures

1) New Structures/Customize Structure/Move Pole command with options to snap pole to a survey point or move it freehand (good for moving guy stub poles).

2) New Structures/Customize Structure/Move Guy Anchor/Slope Intersect with TIN command to adjust guy lengths as needed to hit ground. Can operate on a single selected guy or all guys over a range of structures.

3) New Structures/Customize Structure/Move Arm command with options to orient arm perpendicular to a selected wire or alignment segment.

Wires / sections

1) F1/Display Features/Dance Wires or Structures animates wire movement from one Danger Tree Locator weather case to another. Can also create a video of this animation.

2) Cable file dialog now has conductor specific settings for outer strand compression limits. Also has a stock number input (for future inclusion of cables in material list). These additions required a change to the cable file format.

3) New Sections/Swap Attachments command lets you graphically drag wires from one attachment to another.

4) Graphical sag fit methods 4 and 6 now have options to fit to:
  a) Center of rectangle encompassing all points within 1m of current center span wire position
  b) Lowest of all points within 1m of current center span wire position
  c) Center of smallest circle enclosing all points within 1m of current center span wire position
  d) Bundle aware centroid of all points within 1m of current center span wire position. Program will construct a bundle polygon based on specified bundle diameter and number of sub conductors and then finds best fit to the selected points. Of all the available options this one is least sensitive to outliers.

5) Graphical sag dialog now has a "QC Report" button that produces a report with mid span cross section graphics showing current wire position in relation to the desired wire position and wire points. This option only works with fit methods 4 and 6.

TOWER and PLS-POLE

1) Ground height is now explicitly defined in General/General Data rather than being inferred from the elevation of the lowest fixed joint. Enables additional customization commands in PLS-CADD

2) File/Model Diff can now be used to compare the current model against multiple other models simultaneously.

3) Now incorporate Addendum 1 of ANSI/TIA 222-G. Addendum 1 results in changes in both capacity and loads. See http://www.powline.com/products/222-g_notes.pdf for complete information BEFORE installing this upgrade.

4) Version 10 manuals available. TOWER manual available in Spanish, PLS-POLE translation in progress.

5) Can now display loads calculated according to a SAPS based method (SAPS, RTE, ASCE 74-2006M) in the deformed geometry after running an analysis.

6) Added support for 3DConnexion 3D input devices like the SpaceNavigator.

7) Support Windows 7 Release Candidate including multi-touch input to zoom, pan and rotate geometry views.

8) Now available in a 64 bit edition for Windows XP x64, Vista x64 and Windows 7 x64. 32 bit versions are still available.

9) Increased stock number, element property and insulator property labels from 20 to 40 characters and incremented all file format versions as a result.

10) Multiple file selection dialogs (Batch Modify, Batch Run, etc.) now allow selection of files in multiple folders on Windows Vista if use "Search" edit field to find them.

11) All tables now display statistics in the status bar when a range of numbers is selected (including, min, max, ave, etc.).

12) Can now right click in reports and select "Goto/<Section Name>" to be taken to where Section Name is in the report.

TOWER

1) View/Display Options "Hide Symmetrical Labels" now hides Group Labels on generated members in addition to member and joint labels.

2) Now provide Section Load Case Information summary for all possible wind loading methods. This makes it easy to compare SAPS wind load vs. Wind On All vs. NESC 2007 etc.

3) The equipment components file now has a separate drag coefficient column so that it does not need to be included with the wind area. Note that user input drag coefficient is overridden when using a Microwave Antenna Shape.

4) Numerous small improvements and fixes to the family optimizer. In particular, it now better handles optimizing families that contain crossing diagonals.

5) Misc. improvements to reduce File/Open times, analysis time, redraw time, and memory usage as well as to address stability issues in response to crash reports.

7) Increased maximum number of joints, beams, cables and trusses from 6000 to 8500 and total number of elements from 12000 to 21000 for modeling large gantry structures and masts.

8) 222-G block shear and net section tension capacity calculations made less conservative (see http://www.powline.com/products/222-g_notes.pdf for details).

9) The view "draw joint circles" option now draws circles for secondary joints in orange to make them easily distinguishable from primary joints.

10) For 222-G appurtenances (equipment) reduced directionality factor, Kd, from 0.95 to more liberal 0.85 since this appears to be the intent of Addendum 1 even though it is not stated clearly.

11) Reduced the time Model/Check and model updating takes by 30% for very large models (10,000+ joints and members).

PLS-POLE

1) Added a Fiber Reinforced Polymer pole element so can model FRP poles from Resin Systems.

2) Improved Allowable Suspension Insulator Swing Angle calculator handling of insulators that are running angles for some conditions, but not others. Also sped up the calculator by a factor of 2-4x.

3) Added "F1/Enable ASCE48-10 Wedge base plate proposed method" option for use by ASCE48 committee members. If you don't know what the Wedge method is then don't use it.

4) Increased maximum number of poles, cables, beams and joints to allow for modeling of extraordinarily large substation and bird mitigation structures.

5) Now allow vangs to be placed on horizontal poles. In this case, azimuth is defined to be in the horizontal plane rather than the vertical plane.

6) Can now generate allowable spans/interaction diagrams files for PLS-CADD for left turn structures (asymmetrical structures that only work at negative line angles).

7) Restructured analysis of concrete poles so that cracked and uncracked conditions can be analyzed more efficiently on multi-core computers.

8) Vector and Wire Load Cases now have an optional temperature (stored in the .lca/.lic file) which is used by the FRP element.

9) Can now right click on any column in the various Components tables in order to sort by that column.

10) Model errors found when performing automatic pole selection for PLS-CADD are now propagated back to PLS-CADD.

11) Now apply 5 Pa of wind pressure in longitudinal or transverse direction for all load cases that are perfectly symmetrical (do not have any load applied in the T or L direction) to assist in detecting structure instability. Previously only did this for guyed poles and frames.