

Power Line Systems

IT'S ALL ABOUT YOUR POWER LINES

2017 PLS-CADD Advanced Training and User Group

Jumpers in PLS-CADD

by

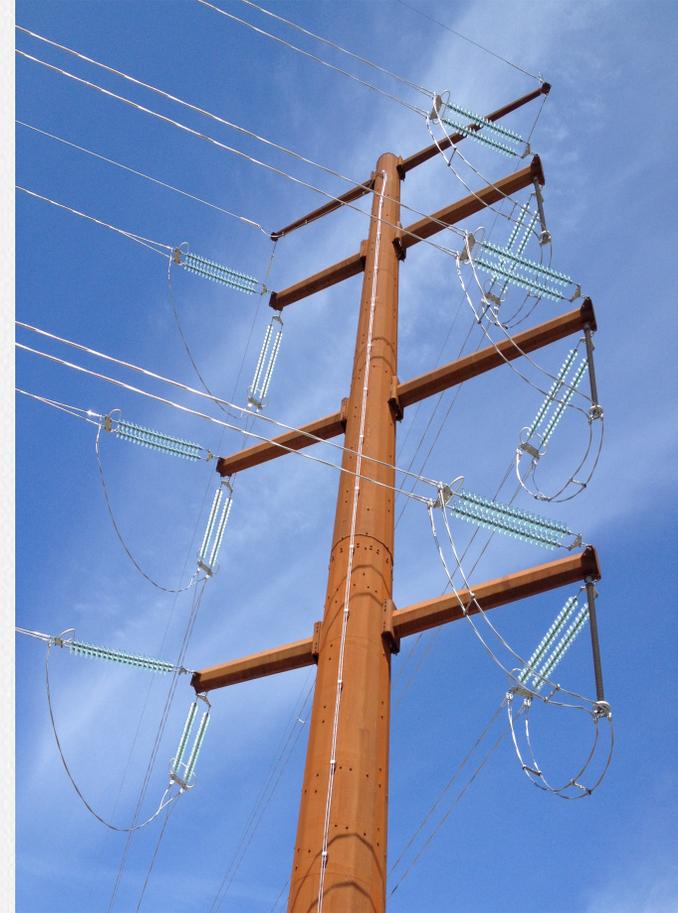
Eric Peyrot
Power Line Systems, Inc.

Jumpers in PLS-CADD

- Goals
 - Clearances from jumpers to structures, guys & wires
 - Visual of jumper behavior
 - Track jumper material
- Jumper Types
 - Flexible
 - Rigid

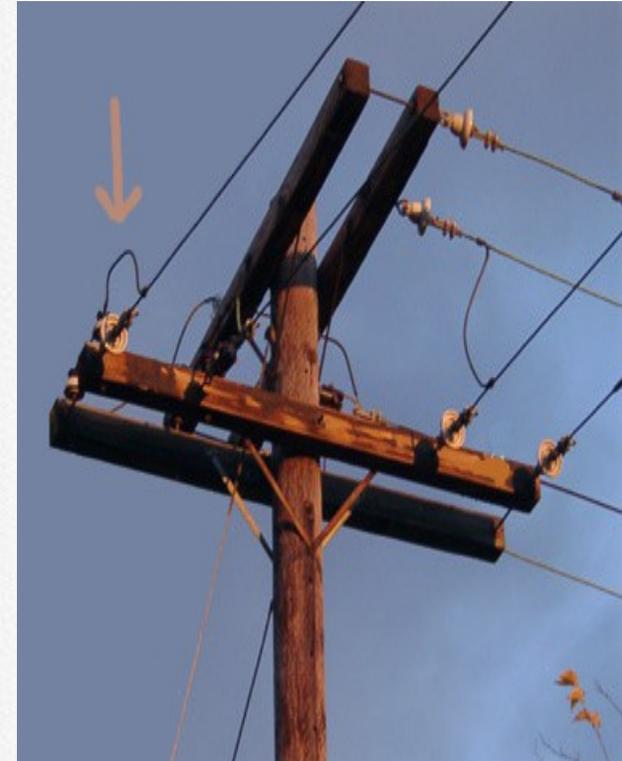
Flexible Jumpers

- Wires connecting 2 sections and up to 3 idlers
- Geometry options
 - Jumper length
 - Jumper sag
- Included in FE Sag-Tension model
 - Nonlinear catenary shape cable element
 - Properties, wind & ice same as start section wire



Rigid Jumpers

- Line segments connecting 2 sections and up to 3 idlers
- Geometry options
 - Straight line
 - Custom shape with 10 intermediate points
- Not part of FE Sag-Tension model
 - Shape stretched to fit FE geometry post analysis
 - Load added post analysis
 - Properties, wind & ice load same as start section wire



Performance

- Speed
 - Requires use of FE condition
 - L2 FE sag-tension models grow up to 3x (slower)
 - L3/L4 FE sag-tension not impacted
- Accuracy
 - Real wire neither perfectly flexible or rigid
 - Not modeling rigidity & departure angle at hardware
 - Line construction isn't inch accurate business



Relevant PLS-CADD Commands

- "Criteria/SAPS Finite Element Sag-Tension" has on/off switch for jumpers
- "Structures/Modify" dialog "Jumpers" button to edit jumpers
- "Lines/Reports/Summary" includes "Jumper Report"
- "Sections/Clearances/To Ground" with "Centerline", "TIN Vertical" and "TIN Minimum Distance" options
- "Sections/Clearances/To Structure"
- "Sections/Clearances/Between Sections"
- "Lines/Reports/Structure Clearances"
- "Lines/Reports/Wire Clearances"

Jumper Configuration Input

The screenshot displays the PLS-CADD software interface. The main window shows a 3D model of a power line structure with two towers and several red jumpers. A 'Structure Modify' dialog box is open, showing parameters for Structure #2, including line angle, station, height adjust, offset adjust, and orientation. Below the dialog is a 'Jumper Configuration' table with the following data:

	Jumper Type	Jumper Connection 1 Set:Phase	Jumper Connection 2 Set:Phase	Jumper Connection 3 Set:Phase	Jumper Connection 4 Set:Phase	Jumper Connection 5 Set:Phase	Jumper Con. 1 Sag (+) or Len (-) (ft)	Jumper Con. 2 Sag (+) or Len (-) (ft)	Jumper Con. 3 Sag (+) or Len (-) (ft)	Jumper Con. 4 Sag (+) or Len (-) (ft)	Jumper Con. 5 Sag (+) or Len (-) (ft)	Jumper Con. 1 Rigid Jumper Shape	Jumper Con. 2 Rigid Jumper Shape	Jumper Con. 3 Rigid Jumper Shape	Jumper Con. 4 Rigid Jumper Shape	Jumper Con. 5 Rigid Jumper Shape	Jumper Stock Number
1	Flexible	5:1 LA	60:1 LJ	15:1 LB			2.000	2.000				NA	NA	NA	NA	NA	
2							NA	NA	NA	NA	NA						
3							NA	NA	NA	NA	NA						

6/2/17

Power Line Systems, Inc.

Possible Future Improvements

- Edit jumper by clicking on it
- String graphically clicking on attachments to jumper
- Define rigid shape graphically from selected LiDAR survey points
- Copy jumpers between structures
- Predefine jumpers in PLS-POLE & TOWER
- Electrical feature integration
 - Use jumpers to trace circuit & phase
 - Use electrical feature circuit & phase to identify missing jumpers

Power Line Systems

IT'S ALL ABOUT YOUR POWER LINES

Advanced Sag & Tension
IEC
FAC 008/009
NESC
Materials Management
Structural Analysis
Pole Analysis
Transmission
NERC Ratings
Line Optimization
Jumpers
ASCE
Joint Use
PLS-POLE
GO95
FAC 003
Vegetation Management
Storm Hardening
1000+ Users in 100+ Countries
IEEE
Line Ratings
TOWER
Drafting
PLS-CADD
CENELEC
LiDAR Modeling
CSA
Distribution
Distribution

POWER LINE[®]
S Y S T E M S · I N C ·

Madison, Wisconsin 53705, USA
Phone: 608-238-2171 Fax: 608-238-9241
info@powline.com www.powline.com

POWER LINE[®]
S Y S T E M S · I N C ·

IT'S THE SOLUTION