Jumpers in PLS-CADD

by

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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 Clearances to Structure

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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
- Copyjumpers 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