

IT'S ALL ABOUT YOUR POWER LINES

2013 PLS-CADD Advanced Training and User Group

# What's New in TOWER

# Erik Jacobsen Power Line Systems, Inc.

by



IT'S THE SOLUTION

#### Introduction

- Improvements since the July 2011 ATUG
   ~80 items listed in handout will show some of them
- The Future
- Q/A as time permits

Family Manager	
Interface Elevation (ft) 0	
Show interface planes	
Run all Body and Leg Extensions	
Open Deformed Geometry for each BLE	
Run active BLE only	
+Middle B50+L64+L64+L6	
+Uneven B50+B100+L64+L	
*+Legless B50+B100	
Edit New Delete	Сору
Sat Active Export TOW Report	Rebuild Close
Ser Acave Export 10W Report	

2

7/17/2013

### Symmetrical Hole Distribution Option

Conservative default assumption
 Can change it in General/General Data



#### Yields more Net Section

7/22/2013

Power Line Systems, Inc.

### **Block Shear from Path Lengths**

Two (or more) lines of connectors (g>0)
 Block Shear not calculated automatically

R<sub>BSH</sub>, the connection "block shear" capacity is determined as:

 $R_{BSH} = F_u \times 0.60 \times A_v + F_y \times A_t$ 

- Enter Shear and Tension Path Lengths in Angle Members table and TOWER computes  $A_v$  and  $A_t$  for you so get  $R_{BSH}$ 

Member	Group	Section	Symmetry	Origin	End	Ecc.	Rest.	Ratio	Ratio	Ratio	Bolt	ŧ	# Bolt	# Shear	Connect	Short	Long	End	Bolt	Shear	Tension
Label	Label	Label	Code	Joint	Joint	Code	Code	RLX	RLY	RLZ	Type	Bolts	Holes	Planes	Leg	Edge	Edge	Dist.	Spacing	Path	Path
																Dist.	Dist.			Length	Length
																(in)	(in)	(in)	(in)	(in)	(in)

7/22/2013

Power Line Systems, Inc.

## **Comp Load in Tension-Only Members**

- How much compression load can a Tonly member take?
- Problems:
  - 1)T-Only member in compression may control usage of structure
  - 2) Usage of T-Only in compression can exceed 100% when SF < 1</li>
  - 3) May want compression in T-Only to be 0

# **Tension-Only Comp Load Solution**

 Use new General/General Data setting to limit amount of compression load in T-Only members

General Data		P	X
Project Title	EXAMPLE 1 - FICTITIOUS	DC TOWER	
Project Notes	SIMILAR TO EXAMPLE IN	ASCE MANUAL 52	
1			
Enable automatic project revision tracking	g during each save		
General Data Design Checks F	Redundant Members		
Load Type		Standard (.lca/.lic)	•
Z of ground for wind height adjust and	d PLS-CADD centerline	(ft) ·18	
Structure shape (used for drag coeffic	cient selection)	Rectangular	-
Allow separate face for each section	(restricts face membership to r	members in sections)	
T only member maximum compression	load as a percent of compres	ssion capacity 100	
Nonlinear Convergence Parameters		Standard	-
Analysis Options	Analysis Typ	e	_
Design Check for Single Structure	ure 💿 Linear		
Basic Allowable Spans	Nonlinea	ar -	
Create a Method 1 File for PLS-	CADD		
<ul> <li>Allowable Spans Interactions Di</li> </ul>	iagrams		
Create a Method 2 File for PLS-	CADD		
		OK	Cancel

### STL Export

- F1/Debugging Stuff/STL Export
- Produces a STereoLithography file aka Standard Tessellation Language
- STL files consumed by 3D printers and most 3D modeling and CAM systems
- Use to produce presentation models
- Also available in PLS-POLE

7

#### STL





#### SLA 7000 3D printer

#### 156:1 scale models

7/22/2013

Power Line Systems, Inc.

#### **Demo of Interface Improvements**



### The Immediate Future

- Body and Leg Extensions
  - Up to 4 body and 4 leg extensions per configuration (complete TOWER model)
  - 512 configurations in one ".tow" file
    - No extra files required
  - Build configuration simply by selecting body and leg extensions

### **Post-Immediate Future**

- Manually select configuration when spotting in PLS-CADD
- Automatic optimum leg/body extension selection when spotting in PLS-CADD
- Aluminum towers
- Limited drafting (not detailing!)
- Automatic unbraced length ratio calculations

### **Post-Immediate Future Continued**

- Crossing diagonal improvements
- COG calculations
- More codes (EN50341-1:2012 anyone?)

Your suggestions at the round table

#### **Power Line Systems**



IT'S THE SOLUTION