"Current Trends in Utility Pole Maintenance"

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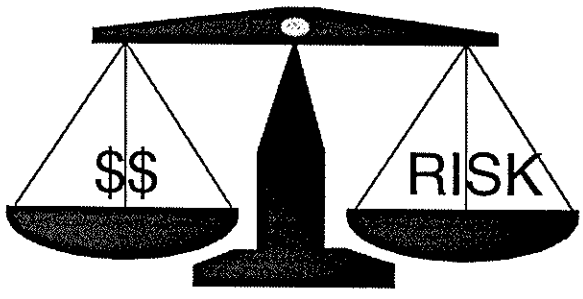
Wood Pole Life Cycle Management



Question:

What is your perspective on pole care and maintenance for distribution and transmission wood poles?

Answer:

1. Life Cycle Management of the wood pole plant is absolutely essential for financial success in a deregulated, re-regulated or competitive model.

   Purchase & Handling

   Maintenance

   Restoration vs. Replacement

   Replacement

   Recycling or Disposal

Answer:

2. The Distribution System represents the greatest risk to electric utility success, and also presents the greatest opportunities for cost reductions and customer retention.

   Cost Driver vs. Revenue Generating Asset

   Losses vs. Efficient Distribution Channel

   Pathway for Competition to your Customers

   vs.

   Pathway for Your Services and a Toll Road.

Typical Pole Inspection & Treatment Programs for Distribution:

Strengths:

1. Focus on reliability & safety.
2. Conservative decision making on "reject" poles.
3. Emphasis on pole life extension through remedial treatments.
4. Extensive information about pole condition & attachments.

Typical Pole Inspection & Treatment Programs for Distribution:

Weaknesses:

1. Lack of defined "Management Objectives" for:
   a.) Economic Outcomes
   b.) Risk Management
2. Lack of integration with utility organization to optimize life cycles of wood poles.
3. Replacement decisions not optimized.
4. Attribute Information lacks focus and specific uses and users.

Wood Pole Life Cycle Cost Analysis

Assumptions:

Number of Poles	1,000,000
Average Replacement Cost	$1,500
Average Restoration Cost	$325
Blended Cost @ 60%-40%	$1,030
Managed Pole Service Life	30 Years
	35 Years
	40 Years
	50 Years

Wood Pole
Life Cycle Cost Analysis

30 Year Pole Life

1,000,000 poles/30 years = 33,333 poles per year

33,333 x $1,030 each = $34,333,333 per year

Wood Pole
Life Cycle Cost Analysis

35 Year Pole Life

1,000,000 poles/35 years = 28,571 poles per year

28,571 x $1,030 each = $29,428,571 per year

Wood Pole
Life Cycle Cost Analysis

40 Year Pole Life

1,000,000 poles/40 years = 25,000 poles per year

25,000 x $1,030 each = $25,750,000 per year

Wood Pole
Life Cycle Cost Analysis

50 Year Pole Life

1,000,000 poles/50 years = 20,000 poles per year

20,000 x $1,030 each = $20,600,000 per year

Wood Pole
Life Cycle Cost Analysis
Summary

Attainable Life	Annual Cost	Savings Per Year
30 Years	$34,333,333	----------
35 Years	$29,428,571	$4,904,762
40 Years	$25,750,000	$8,583,333
50 Years	$20,600,000	$13,733,333

Summary:

1. Optimize the Pole Plant Life Cycle Management Program.

2. Control and minimize unnecessary replacement costs.

3. Leverage the visit to the pole.

Wood Pole Service Life Management Options

Predictive Maintenance. or

Preventative Maintenance, or

Combined Benefits of both

Predictive & Preventative Maintenance

Predictive Maintenance

Definition: Locate and Report conditions which may contribute to a failure, to allow for repair or maintenance at low cost.

Purpose: Avoid outages and failures.

Examples:

Visual inspections

Split Top	Trees in Wires
Leaking Transformer	Broken Ground Wire
Wood Pin Insulator	Broken Guy Wire

Preventative Maintenance

Definition: Proactive intervention, usually in the normal aging process of an asset, designed to extend its reliable life.

Purpose: Save money. Relative small **maintenance investments** yield high returns by reducing **capital spending**

Examples:

Remedial Treatment of Wood Poles
Trees Trimming
Tower Printing

Best-In-Class Wood Pole Life Cycle Management Program

Predictive Maintenance
+ Preventative Maintenance
+ Field Data Acquisition
+ Restoration
+ Management Controls
= Best-In-Class Wood Pole Plant Life Cycle Management

Best-In-Class Wood Pole Life Cycle Management Program

The Details:

1. Accurate Inspection	- Pole Condition - Overhead Facilities
2. Selective Remedial Treatment candidates	- Identify 98% of treatment - Apply effective and appropriate remedial treatment

3. Prioritize "Reject Poles	- Redefine or reconfirm reject criteria - Prioritize follow-up costs based on real comparative risk - Optimize use of lower cost Pole Restoration
4. Optimize Field Data	- Joint use data - GIS applications (mapping, transformer to meter ties, etc.) - Pole Maintenance GIS

Partial Excavate/ Selective Treatment = Reliability Based Maintenance for Wood Poles

* Inspection is intrusive and can be accurate
* Remedial treatment applied based on pole condition, not pole age
* Lower cost per pole than full G/L (time-based maintenance) but can yield equivalent results

Overview of 1,000 Poles

Full Groundline			Partial Excavate/Selective Treat		
Work Item	Quantity	Price Each	Work Item	Quantity	Price Each
Visual	200	$2.50	Visual	200	$2.50
Sound & Bore	150	$4.00	Sound & Bore	150	$4.00
			Partial Excavate, Pass or Reject		
Excavate, Treat or reject	650	$22.50	Excavate, Treat or reject	200	$22.50
	1,000 poles	$15.73 Avg. Cost/Pole		1,000 poles	$10.10 Avg. Cost/Pole

35% cost savings

50,000 poles per year = $281,500 savings per year

80,000 poles per year = $450,400 savings per year

- For Example Purpose Only