The Myth of “Aging” Pole & Tower Infrastructure on Long-Term Reliability:
Why Quality Manufacturing is a Far More Important Factor!

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Why this topic?

We depend on electricity to heat, cool, and light our homes; refrigerate and prepare our food; pump and purify our water; handle sewage; and support most of our communications and entertainment. As a society, we depend on electricity to light our streets; control the flow of traffic on the roads, rails, and in the air; operate the myriad physical and information supply chains that create, produce, and distribute goods and services; maintain public safety, and help assure our national security.

Source: IEEE Report - Grid Resilience and the NESC
Energy D+

3,571 total power outages reported in one year
Is Our Weather Related Loading Criteria really to Blame?

U.S. Electric Outage Events by Cause and Magnitude, 2015

Source: IEEE Report - Grid Resilience and the NESC
If we assume our Designs are good (including weather event loading criteria) what is left except aging or undetected “quality escapes”?
How do we think about “Aging”?
Shouldn’t we also think about initial “Quality”?
Seam weld split in splice overlap area due to weld defects (porosity)
Stress riser created by excessive grinding on shaft bendline
Metal Cracking due to inadequate bend radius
Anchor bolt testing due to severely out of tolerance manufacturing
Weld failure due to propagated post-galvanizing toe cracks not detected following galvanizing.
Excessive distortion due to oversized weld being applied contributing to toe cracking.
Improper repair of mislocated thru vang cutout
Weld failure on deadend conductor vang due to lack of fusion during welding
Stressors on Manufacturing Quality:

• Design Methodologies
• Competitive Market Pressures
  • Price
  • Lead-times
• Manufacturing
  • Rapid Growth
  • New Entrants
• Emphasis on Lean Initiatives
Exo Audit Method:

- Project Contract/Agreement
- Fabricator’s Quality Program
- Fabricator’s Drawings
- Safety Housekeeping
- Fabricator’s Biographical Information
- Equipment
- Inspection & Testing Equipment
- Fabrication
- Welding
- Material Control
- QC Inspections and Tolerances
- Galvanizing Facilities
- Coatings/Blasting
- Shipping and Logistics
How much attention do we pay to Quality?

Critical Audit Categories

- Fabrication (Layout / Fit-up)
- Welding
- Inspection

Overall Audit Score (All 14 Categories)

Structure
Manufacturer
Industry
Average Score

Score: C-
Industry Average Audit Score

2017: C
2018: C
2019: C-
In-Plant Inspection Non-Conformances (NCRs):

- Errors of Knowledge
- Errors of Performance
- Errors of Intent
End of Warranty Inspections

• Benefits
  • Risk mitigation
  • Protect your assets
  • Supplier accountability
In summary:

Poles & Towers that start stronger live longer!
THANK YOU FOR YOUR TIME!

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