Liberty QA Proposal

CFVM proposes to perform an annual statistically valid audit of distribution and transmission miles for adherence to regulatory minimum clearance requirements. The 2023 QA audit will set a baseline for future audits and provide root cause analysis for any findings. The timeframe for each audit should be early summer but after the majority of snow has melted.

The following information is based on the data set labeled "spans2023-01-04".

Total population	707.3 miles	

Voltage breakdown

Distribution	606.3 miles	85.7%
Transmission (60kv)	81.1 miles	11.5%
Transmission (120kv)	19.9 miles	2.8%

REAX Risk breakdown

Very High	175.4 miles	24.8%
High	141.5 miles	20.0%
Moderate	161.6 miles	22.8%
Low	203.9 miles	28.8%
Temporary reduction	24.8 miles	3.5%

Sample Methodology

95% Confidence
99% Estimate of compliance
3% Error rate

A population of 707.3 miles results in a sample size of **41 miles**.

There are 19,845 spans that make up the 707.3 miles. Average span length indicates 1,148 spans must be audited to reach 41 miles. It is recommended that instead of visiting 1,148 separate, random locations, that random locations are "expanded" to 5 spans each. **230**, 5 span locations must be audited in order to reach the minimum sample size of 41 miles. Since the additional 4 spans are not known at the time of planning, completed mileage will be tracked during the audit and more or less locations may be performed as needed.

Sample Breakdown

After randomizing the 19,845 spans in the data set "spans2023-01-04", the first 230 were labeled "Sample" and numbered 1 through 230. The following is derived from assuming the

additional 4 spans around each Sample span have the same attributes and using the sample span's distance multiplied by 5.

Total sample   41 miles

Voltage breakdown
Distribution   36.0 miles   87.8%
Transmission (60kv)   4.7 miles   11.5%
Transmission (120kv)   0.6 miles   1.5%

REAX Risk breakdown
Very High   9.6 miles   23.4%
High   7.7 miles   18.8%
Moderate   8.7 miles   21.2%
Low   13.6 miles   33.2%
Temporary reduction   1.6 miles   4.0%

Audit Duration

CFVM estimates it will take 3 to 4 weeks to complete.

Audit Form- Reference data, question and other fields

Status (Pending, Completed, Not Reviewed
From data sheet
Sample/Extra
Sample #
FID
Line ID
Section
Span ID
Voltage
Fire Area
Miles
Auditor
Review Date
Population- From Lidar data- Sum of zones 1, 2 and 3 (0 to 6 feet)
Non-Compliant Trees
Non-Conformant Trees
90 Day Trees
Threat Trees

Report all…

\# Priority 1 Growth Trees (contact or evidence of)

\# Priority 2 Growth Trees (within RCD *not a P1*)

\# Priority 1 Threat Trees (already failing)

\# Priority 2 Threat Trees (failure within 6 months)

~~# Trees within minimum regulatory distance. (or just 4 feet Dist etc based on questions…)~~

\# Trees that will not hold minimum regulatory distance for 90 days. (basically at or very near minimum clearance, too close to call or rare situation of a fast grower that won't hold.)

~~# Trees meeting Priority 1 or 2? Hazard tree criteria??? verbiage/priority~~

Root cause (multiple choice) *only for P1/2 growth findings*

         or

Maybe the root cause is a brief write up of what led to the condition. Who/what program was there last, etc.

Comments

Location expansion rules???

Audit sample span plus 2 extra spans on either side. If up against an end pole, add needed spans to the other side. If against a tap, choose spans to the right. If an Extra span is another Sample span, an additional "Extra" sample + 4 spans will need to be added.

==Fulcrum questions (Jared)…==

Can we load all 19,845 spans into Fulcrum?

Can we show sample spans differently than non sample spans to assist in "growing" each location and avoid overlapping, show where "Extra" spans may need to be added and be able to calculate miles of all completed spans?

==Additional Questions for Liberty . . .==

How would you want us to handle the LRA? This being a snapshot of compliance, we would likely be looking at LRA within a sample and we recognize that Liberty goes for treating all areas like SRA in terms of trimming distances. It would likely be important to clarify this before review begins. Suggest audit all Dist as 4 feet and then separate in reporting. Example is a tree found 3 feet clear in SRA, Non-fire season, Non-HFTD.

==Answer==—-Base all findings on regulatory distances

Any stratification needed based on the random sample? Recommend No. The random sample seems to be spread across various attributes similarly to the population.

Answer— No, random sample

Calculating population preferences…

Based on Lidar grow-ins by span ID (would need to merge data)
Hand count based on proximity, past and future work needed for clearance (not fall in)

Eric Black Jared Kim I thought we were going to auto populate the population with the span data of Trees from LiDAR data. Manually counting the Population will surely slow us down and get us too in our head (may be easy on certain spans, hard on others)

Root Cause Drop Down (being able to select multiple may be required)
N/A
Scheduling
Missed by Inspection
No-worked by Inspection
No-worked by Liberty
No-worked by Tree Crew
No-worked by QC
Clearance not achieved by Tree Crew
Tree not worked by Tree Crew
MWS not documented
MWS documented and does not qualify

Questions for Liberty Thursday, needing to manually count trees for population. Actual versus LiDAR treetops. Having both for Liberty to compare. **Yes, count both manually and actual.**

Would you like a root cause question or addressed in the comments? **Addressed immediately, although it is not set, and can be clarified by spending further time on it.**

Do you want us to notify you of findings as they arise? **Yes, for P1 growth and P1 Threat trees. (With an end of week summary)**

Dead tree findings, How much dead? Long time dead standing? Calculating if it could hit. Lean away/weight away. Priority 2 Conditions Any observed tree, or parts thereof, that is not a Priority 1 condition but is likely to fail and impact electric facilities prior to issuing a planned maintenance work order (**failure may be expected within 6 months**)

Should we assume its fire season? **Yes, especially since Fire season can be backdated by calfire**