

Study Committee B2

Overhead Lines

10155_2022

Resilience and Reality: Unique Challenges and Learnings from Circuit Resiliency Project Planning and Execution related to Overhead Lines

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ComEd

Motivation

- Short Term
 - Reduce/eliminate OA/RAs
 - Improve Operability of circuits
 - Develop new construction/design standards for distribution voltage lines
- Long Term
 - Minimize future maintenance support
 - Increase line longevity
 - Improve customer experience

Method/Approach

- Reviewed industry standards and compared to adopted practices related to construction specifications
- Researched different resiliency techniques being tested across the industry
- Selected criteria based off review and estimated costs to implement new design criteria
- Improve accessibility and operability of the system by relocating out of areas that were not truck accessible

Objects of investigation

- Piloting techniques included:
 - Fiberglass cross arms and poles
 - Minimizing span distances from 180' to 150'
 - Storm guying every 1000'
 - New recloser schemes using fiber communication networks vs radio
- Relocating large sections of existing infrastructure from inaccessible areas to truck accessible locations
- Maximize overhead lines to two circuits per pole

Experimental setup & test results

- Selected 5 lines to pilot:
- Developed custom risk score to identify 2 lines
- Selected 2 lines based on geographical terrain
- Selected 1 line based on recent outages

Discussion

- Through 1H22, 20 miles of circuit installation is complete or 45%
- Effectiveness review of new storm hardening techniques to be performed after construction is complete
- Installed roughly 43 composite poles to date
- Underground cable installation is less per mile than overhead solutions due to accessibility constraints to overhead locations
- Old infrastructure was grandfathered in with no actual land rights
- Relocation of assets to accessible locations required the need for new easements
- Many areas required complicated permitting requirements due to wetlands and endangered species.

Conclusion

- Currently evaluating future program work to determine if holistic approach is most optimal vs segmented approach
- Estimated electrical completion of 5 lines is 1H2024

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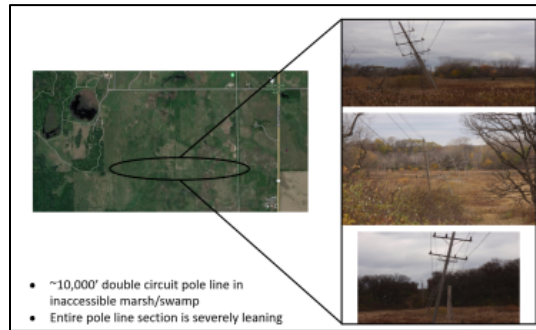
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Composite Poles Installations

- Field Assembly of pole bases



Example of difficult terrain



Installation Techniques

- Underground has had minimal construction delays and makes up for most work completed to date

Cost Comparison

- Underground installation is lowest cost vs overhead and Hendrix cable
- As more work is complete, expectation is for overhead cost to be lowest

Total Miles of Completed Work



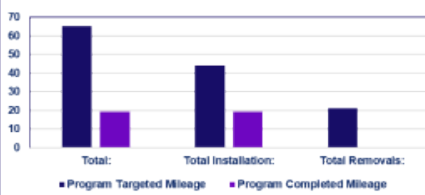
■ Directional Boring ■ Overhead ■ Spacer Cable

Total Cost per Mile of Completed Work



■ Directional Boring ■ Overhead ■ Spacer Cable

Circuit Resiliency Program First 5 Lines Total Mileage Target



Permit and Easements

- Summary of permits and easements needed across first 5 lines
- Average timeframe for Rail Road, Easements and Environmental ranges from 3 months to a year or more

Permit and Easement Summary



Program Mileage Type	First 5 Lines Targeted Mileage	First 5 Lines Completed Mileage
Total Installation:	44.09	20.21
Total Removals:	21.28	0.00
TOTALS:	65.37	20.21