OCEC Underground vs Overhead

Whenever a major weather-related catastrophe occurs or land is being developed, the question of placing overhead power lines underground surges. The answer to the proverbial question, “Why can’t overhead power lines be placed underground?” is, “They can be, but it’s expensive.”

Higher initial construction costs. HiLine Engineering reports that 1 mile of new overhead costs around $15,000 compared to $25,000 for underground. For a new electrical service with a 25 kVA transformer overhead costs approximately $2,500 compared to $5,000 for underground.

Maintenance costs. The present worth of the maintenance costs associated with underground lines is difficult to assess. Many variables are involved, and many assumptions are required to arrive at what would be a guess at best. Predicting the performance of an underground line is difficult, yet the maintenance costs associated with an underground line are significant and one of the major impediments to the more extensive use of underground construction. Major factors that impact the maintenance costs for underground transmission lines include:

Life Expectancy. The life expectancy of an underground line is 30 years compared to 30-50 years for overhead wire. The insulation used on underground wire is susceptible to insulation deterioration because of the loading and unloading cycles constantly placed upon them. Once insulation fails faults are common and wire has to be replaced.

Cable repairs. If and when an underground fault occurs the cost of finding its location, trenching, cable splicing, and re-embedment is sometimes five to 10 times more expensive than repairing a fault in an overhead line where the conductors are visible, readily accessible and easier to repair.

Line outage durations. A recent study reported that overhead outages lasted an average of 92 minutes compared to 145 minutes for underground. The durations of underground line outages vary widely depending on the operating voltage, site conditions, failure, and material availability.