Using a technology-driven risk model to better target network vegetation threats

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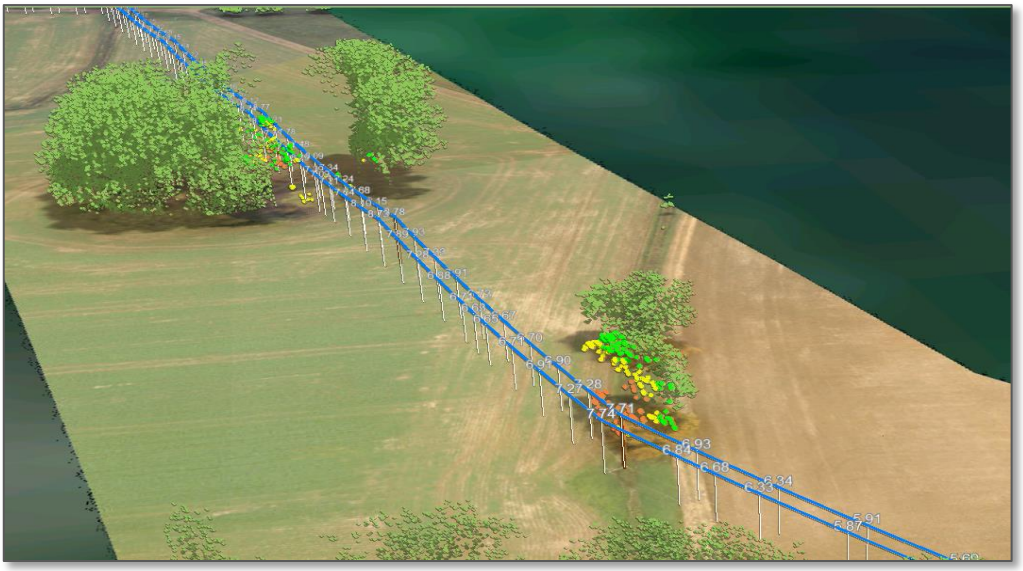
Most electrical networks with overhead infrastructure are subject to threats from falling or growing vegetation, with the operators spending significant sums in scoping and managing their easements. However, it can be argued that the effort is focused on maintaining compliance, not managing the overall risk as effectively as possible, within a given budgetary constraint. We propose that remote sensing technology paired with a range of analytics can provide network operators with far greater insight and enable the improved deployment of resources; in turn reducing the possibility of an incident or network disruption. A key component of the analytics is the means to directly relate data to quantifiable network risk.

The premise is based on the use of forestry literature-based likelihood models for tree growth and fall, which are in turn derived from sources such as LiDAR, meteorological patterns, historical statistics, hyperspectral imaging and ground verification studies. By pairing reliable and tested models of likelihood, and applying this against a consequence metric based on factors such as the number of connected customers and the fire risk-rating, a meaningful risk scoring can be applied. The risk scoring itself is referenced to both the powerline asset and the individual tree in the spatial environment, enabling the use of optimisation and work planning tools to efficiently balance risk mitigation with cost efficiency.

We believe that this approach will enable network operators to reduce the incidence of outages due to vegetation, better prepare for storm incidents and help prevent fires caused by touching or flashover. Collaborative research is used to demonstrate the concept on networks in the UK and Australia showing the various data inputs, analysis techniques and functional outputs of the methods. Suggestions are made for areas requiring further research and the challenges in adopting such a model as opposed to existing approaches, from a regulatory and internal utility policy perspective.



Key words: risk, LiDAR, remote sensing, vegetation, overhead lines

References: TBA