Frequently Asked Questions

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1. Which Transmission Line Rating Methods do you utilise?

WeatheRate offers a line rating service which includes the following calculation methodologies:

a) ESAA publication D(b)5:1988 - Current rating of bare overhead conductors
b) TNSP Co-operative Charter Plant Rating Working Group. (2009). TNSP Operational Line Ratings. [Online]. Available: http://www.aer.gov.au/

It is acknowledged that the IEEE, IEC and CIGRE provide other recommendations or calculations for bare overhead conductors which may differ from these two methods. However, the ESAA and TNSP approaches are now the industry standard approaches utilised in Australia. Nevertheless, we are able to change our calculation routines depending on your specific requirements.

2. Where should we install wind speed transducers?

The thermal inertia of overhead conductors means that wind speed measurements can often be applied to conductors some distance from the measuring point. Since most transmission and distribution lines are relatively short, suitable ratings can be obtained by installing stations within nearby zone substations.
It is also interesting to note that many utilities install wind speed measuring equipment at distances of up to 35km on longer transmission lines [1]. It has also been noted that "weather data from either (substation) location can be used to yield a reasonable estimate of the actual dynamic thermal line rating". [2]

Our clients are mostly electricity distribution companies who wish to quantify or improve the ratings of shorter sub-transmission and distribution assets. Substation installations are appropriate in this case.
We have also found that the reliability of solar-panel-based systems can be affected during prolonged periods of cloud cover. Moreover, a hard wired solution avoids the need to perform regular battery and solar panel maintenance and adds to the data reliability.

References

[1]TNSP Co-operative Charter Plant Rating Working Group. (2009). TNSP Operational Line Ratings. [Online]. Available: http://www.aer.gov.au/
[2] P. M. Callahan, D. A. Douglass, "An experimental evaluation of a thermal line uprating by conductor temperature and weather monitoring," Power Delivery, IEEE Transactions on , vol.3, no.4, pp.1960-1967, Oct 1988

3. Aren't conductor tension transducers better for rating calculations?

Tension monitoring can provide accurate conductor temperature estimates, but these systems are expensive and require initial calibration between tension and conductor temperature. Moreover, it is not possible to derive permissible short-time ratings from tension measurements as the thermal inertia is a function of the ambient weather conditions.

4. What happens if the calculated ratings are less than our existing ratings?

The calculated short-time ratings are unlikely to be less than existing rating calculations if appropriate assumptions have been used to develop the existing ratings. With regard to the continuous rating calculations; most deterministic methods to calculate transmission line ratings include parameters that implicitly include a probability that the conductor temperature may be exceeded. However, a ratings engineer will not know if this has occurred throughout the year.

WeatheRate provides a unique facility where ratings are calculated according to the ambient weather conditions. Consequently, this calculation may identify the periods of poor rating that deterministic methods would miss. Most regulatory structures provide some flexibility with the calculated ratings. For instance, NSW distribution authorities are allowed to exceed calculated ratings by up to 20% as long as this does not occur for more than 1% of the year. If necessary, studies can then be undertaken to assess the network compliance by comparing the N-1 feeder loading against the observed rating for each metering point throughout the year. This N-1 analysis may also rely on the use of short-time ratings if load can be transferred within 10 minutes.

5. Are there situations where WeatheRate systems should not be used?

Yes. We provide a cost effective service that relies on adequate mobile telephony coverage. Other rating assessments should be employed where telemetry is not available. Similarly, other approaches may be more applicable if there is only one span critical span along the transmission line and wind speed measurements cannot be made at this location. Even so, we offer a very competitive service and are keen to discuss any specific requirements you may have.

6. What data plans should we use with the weather stations?

The answer to the question depends on which telecommunications network you are using. Most of our stations are configured to transmit an equivalent of 1440 kB of information per day using a mobile broadband service. However, our hardware is also configured to connect and disconnect from this service regularly to increase the reliability of the data. Consequently, the minimum charge rate provided by the telecommunications service provider is often the limiting factor. Our sales consultants can provide more specific information on this issue. Nevertheless, we have found that most 1 or 2GB/month mobile data plans are sufficient for use in our stations.

7. Can you interface with our SCADA system?

WeatheRate provides a unique service where ratings are published on a customer specific Internet portal. If required, it is possible to extract information from HTML or XML and utilise this within SCADA routines.

Nevertheless, our mission and corporate vision is simply to provide cost-effective services that enable the deferral of capital expenditure. As such, our systems are designed to be dynamic in that you can move stations or monitored lines from one location to another after the completion of a capital project. Consequently, we have found that our internet-based portals are often more convenient for Planners, Operators and Ratings Engineers.

8. Can you provide self-powered weather stations?

Yes. But we strongly recommend a hardwired solution within the zone substation as this has positive implications for ongoing system reliability and maintainability. Self powered tower or pole mounted weather stations are really only required when there is a known span of poor clearance in the middle of a long transmission line, and there are no nearby zone substations where suitable measurements can be taken.