

The Valley Group, Inc.

CAT-1™ Transmission Line Monitoring Systems

Power Outage Task Force Addresses Line Ratings

Recommendation 27: "NERC should develop clear, unambiguous requirements for the calculation of transmission line ratings including dynamic ratings"

Background

The paragraph below is taken from NERC's *U.S.-Canada Power System Outage Task Force - August 14 [2003] Blackout: Causes and Recommendations* report, page 162. See page 59 of chapters 7-10 found on the NERC website at http://www.nerc.com/pub/sys/all_updl/docs/blackout/ch7-10.pdf.

27. Develop enforceable standards for transmission line ratings.³⁹

NERC should develop clear, unambiguous requirements for the calculation of transmission line ratings (including dynamic ratings), and require that all lines of 115 kV or higher be rerated according to these requirements by June 30, 2005.

As seen on August 14, inadequate vegetation management can lead to the loss of transmission lines that are not overloaded, at least not according to their rated limits. The investigation of the blackout, however, also found that even after allowing for regional or geographic differences, there is still significant variation in how the ratings of existing lines have been calculated. This variation—in terms of assumed ambient temperatures, wind speeds, conductor strength, and the purposes and duration of normal, seasonal, and emergency ratings—makes the ratings themselves unclear, inconsistent, and unreliable across a region or between regions. This situation creates unnecessary and unacceptable uncertainties about the safe carrying capacity of individual lines on the transmission networks. Further, the appropriate use of dynamic line ratings needs to be included in this review because adjusting a line's rating according to changes in ambient conditions may enable the line to carry a larger load while still meeting safety requirements.

The blackout investigation revealed the fact that many transmission owners select their transmission line ratings using questionable assumptions. It has also become evident that the situation on August 14, 2003 could have been detected and prevented by use of dynamic ratings from commercially available line monitoring systems. While NERC is working on general guidance, prudent transmission owners should act immediately.

Without use of dynamic monitoring, assumptions must be conservative to maximize reliability - This occurs at the expense of network capacity. But if lines are properly monitored, planning assumptions can be based on probabilistic criteria because operators will always know the actual state of the lines. Operators will have ample advance notice to avoid setting the stage for a potential cascading event.

"Properly monitored" means monitoring the actual state of the conductor. Conversely, airport weather reports and substation wind measurements do not constitute valid sources of data for safe, accurate, or reliable transmission line capacity calculations, as numerous studies have concluded.

While FERC apparently leans towards requiring uniform transmission rating criteria, most transmission owners prefer only minimal changes to the present state of affairs. Eventually, a compromise between these divergent positions seems likely. But regardless of whatever the exact solution is, transmission owners clearly should prepare themselves for changes in line rating requirements.

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Preparing your utility for line rating requirements

The Valley Group can help prepare your utility for new line rating requirements in three different ways.

First, our RateKit Thermal Rating Toolkit software can be used to study the risks associated with changing various line rating assumptions and the consequences of changes in line rating requirements. RateKit is the most advanced and convenient rating program in the market. A free demo can be found at our website, www.cat-1.com, under Products.

Second, The Valley Group is offering a new series of seminars this Fall on "Meeting upcoming transmission line rating requirements: Choosing transmission line ratings and using dynamic ratings", given by two of the world's top thermal rating experts, Tapani Seppa of The Valley Group and Dr. Dale Douglass of Power Delivery Consultants. Further information can be found at www.cat-1.com under Seminars and by e-mailing seminars@cat-1.com you can request information about upcoming seminars near you.

Finally, dynamic ratings from The Valley Group's CAT-1 real time monitoring systems can mitigate the impact of new rating requirements on your utility, by allowing your utility to keep aggressive ratings while ensuring reliability by providing accurate real time information on the actual state of your lines. CAT-1 systems currently provide dynamic ratings for a large number of leading utilities to avoid TLR's and to accommodate postponements in line upgrading and new line construction. See www.cat-1.com under Case Studies for more information, including a recent presentation at Edison Electric Institute's Fall 2003 meeting, highlighting Kansas City Power and Light's experience during the Summer of 2003 (The full PowerPoint presentation is available upon request).

[Note: Highlights and underlines to Recommendation 27 on previous page added for emphasis.]

The Valley Group is the world's leading supplier of transmission line monitoring and dynamic rating systems. Its CAT-1 Transmission Line Monitoring Systems have been proven both reliable and cost-effective in hundreds of commercial applications around the world CAT-1 Systems deliver the true line capabilities sought by NERC in their emerging standards for determining and operating within facility ratings.