GIS Methods for Evaluating Wind Turbine Impacts on NEXRAD

The Radar Operations Center (ROC) has had an outreach program to constructively engage the wind energy development community since 2006. One component of the program is the evaluation of the potential impact of proposed wind farms and wind turbines on neighboring WSR-88D installations. With only minimal information available at the time the evaluations are performed, ROC engineering and operations personnel found that a technique using radar line of sight (RLOS) penetration, the extent of that penetration, and the areal relationship of the wind turbines/farms to the radars provided the foundation for an impact assessment.

Building upon prior software and GIS (geographical information system) developments, the ROC created several GIS-enabled databases to model the interactions of wind farms and wind turbines with the WSR-88D network. A natural outcome of the evaluations was the creation of historical databases of wind farm and wind turbine GIS data that could be used by the ROC Hotline for field support. For a more complete description of the data and processing visit http://www.roc.noaa.gov/WSR88D/WindFarm/GIS.aspx?wid=dev.

Ron Guenther
ROC Engineering Branch

Question?

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Calibration: Calibration is the ability of the radar system to scale the returned power to a magnitude consistent with the standard derived from a known trusted source. The calibration procedure measures the path losses and system gains caused by the various radar hardware components. These gains and losses are included in the weather radar equation used to calculate the reflectivity magnitude related to the returned power. Given the same weather within the sample volume, every calibrated radar should produce the same magnitude (value) for reflectivity. Although the Dual Pol upgrade will change the calibration procedures, the resultant calibration should produce consistent reflectivity values. Thus, red on the radar display is still red!

Summary: While it is true that the Dual Pol upgrade will result in a reduction in sensitivity of about 3.5 – 4.0dB, it will not impact the accuracy of the radar's reflectivity. In other words, red is still red, but some gray may be gone.

Joe N Chrisman
ROC Engineering Branch