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Continuous Reliability Enhancement for Wind (CREW) Database: Wind Plant Reliability Benchmark

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Abstract

To benchmark the current U.S. wind turbine fleet reliability performance and identify the major contributors to component-level failures and other downtime events, the Department of Energy (DOE) funded the development of the Continuous Reliability Enhancement for Wind (CREW) database by Sandia National Laboratories. This report is the second annual Wind Plant Reliability Benchmark, to publically report on CREW findings for the entire wind industry.

The CREW database uses both high resolution Supervisory Control and Data Acquisition (SCADA) data from operating plants and Strategic Power Systems' (SPS) ORAPWind® (Operational Reliability Analysis Program for Wind) data, which consists of downtime and reserve event records and daily summaries of Generating, Unavailable, and Reserve time for each turbine. Together, these data are used as inputs into CREW's reliability modeling.

The results presented here include: the primary CREW Benchmark statistics (operational availability, utilization, capacity factor, mean time between events, and mean downtime); time accounting from an availability perspective; time accounting in terms of the combination of wind speed and generation levels; power curve analysis; and top system and component contributors to unavailability.