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Adapting ORAP® to Wind Plants: Industry Value and Functional Requirements

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Abstract

Strategic Power Systems (SPS) was contracted by Sandia National Laboratories to assess the feasibility of adapting their ORAP (Operational Reliability Analysis Program) tool for deployment to the wind industry. ORAP for Wind is proposed for use as the primary data source for the CREW (Continuous Reliability Enhancement for Wind) database which will be maintained by Sandia to enable reliability analysis of US wind fleet operations. The report primarily addresses the functional requirements of the wind-based system. The SPS ORAP reliability monitoring system has been used successfully for over twenty years to collect RAM (Reliability, Availability, Maintainability) and operations data for benchmarking and analysis of gas and steam turbine performance. This report documents the requirements to adapt the ORAP system for the wind industry. It specifies which existing ORAP design features should be retained, as well as key new requirements for wind. The latter includes alignment with existing and emerging wind industry standards (IEEE 762, ISO 3977 and IEC 61400). There is also a comprehensive list of thirty critical-to-quality (CTQ) functional requirements which must be considered and addressed to establish the optimum design for wind.