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# **SWEEP-TWIST ADAPTIVE ROTOR BLADE: FINAL PROJECT REPORT**

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## **ABSTRACT**

Knight & Carver was contracted by Sandia National Laboratories to develop a Sweep Twist Adaptive Rotor (STAR) blade that reduced operating loads, thereby allowing a larger, more productive rotor. The blade design used outer blade sweep to create twist coupling without angled fiber. Knight & Carver successfully designed, fabricated, tested and evaluated STAR prototype blades. Through laboratory and field tests, Knight & Carver showed the STAR blade met the engineering design criteria and economic goals for the program. A STAR prototype was successfully tested in Tehachapi during 2008 and a large data set was collected to support engineering and commercial development of the technology. This report documents the methodology used to develop the STAR blade design and reviews the approach used for laboratory and field testing. The effort demonstrated that STAR technology can provide significantly greater energy capture without higher operating loads on the turbine.