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**INITIAL STRUCTURAL RESPONSE MEASUREMENTS AND
MODEL VALIDATION FOR THE SANDIA 34-METER VAWT TEST BED**

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ABSTRACT

Sandia National Laboratories (SNL) has designed and constructed a 34-meter diameter vertical axis wind turbine (VAWT) Test Bed. The machine will be used to advance research in aerodynamics and structural dynamics, improve fatigue life prediction capabilities, and investigate control algorithms and system concepts. The Test Bed has extensive instrumentation including 70 strain gauges to measure blade and tower response. Immediately after the blades were mounted, blade gravity stresses were measured and a modal test on the stationary rotor performed to determine zero rpm modal frequencies. Assembly and start-up tests are complete, and testing is in the machine characterization phase. Structural resonance surveys will fully characterize the modal frequencies and mode shapes of the rotor, drive train and guy cables. Measured gravity stresses, centrifugal stresses, and modal frequencies are compared to predicted values.