

LIST/BMI Turbines Instrumentation and Infrastructure

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ABSTRACT

In support of two major SNL programs, the Long-term Inflow and Structural Test (LIST) program and the Blade Manufacturing Initiative (BMI), three Micon 65/13M wind turbines have been erected at the USDA Agriculture Research Service (ARS) center in Bushland, Texas. The inflow and structural response of these turbines are being monitored with an array of 60 instruments: 34 to characterize the inflow, 19 to characterize structural response and 7 to characterize the time-varying state of the turbine. The primary characterization of the inflow into the LIST turbine relies upon an array of five sonic anemometers. Primary characterization of the structural response of the turbine uses several sets of strain gauges to measure bending loads on the blades and the tower and two accelerometers to measure the motion of the nacelle. Data are sampled at a rate of 30 Hz using a newly developed data acquisition system. The system features a time-synchronized continuous data stream and telemetered data from the turbine rotor. This paper documents the instruments and infrastructure that have been developed to monitor these turbines and their inflow.