

UPDATE OF THE LONG-TERM INFLOW AND STRUCTURAL TEST PROGRAM^{*†}

Herbert J. Sutherland, Jose R. Zayas and Aaron J. Sterns
Wind Energy Technology Department
Sandia National Laboratories
Albuquerque, NM 87185-0708
hjsuthe@sandia.gov, jrzayas@sandia.gov and asterns@austin.rr.com

and

Byron A. Neal
USDA, Agriculture Research Service
Conservation & Production Research Laboratory
Bushland, TX 79012-0010
bneal@cprl.ars.usda.gov

ABSTRACT

The Long-term Inflow and Structural Test (LIST) program is collecting long-term, continuous inflow and structural response data to characterize the extreme loads on wind turbines. The initial data set, collected from a heavily instrumented Micon 65/13M turbine with SERI 8-m blades, has been reported previously. The test turbine is located in Bushland, TX, a site that exposes it to a wind regime representative of a Great Plains commercial site. The turbine and its inflow are being characterized with 59 measurements: 34 to characterize the inflow, 18 to characterize structural response, and 7 to characterize the time-varying state of the turbine. While the initial measurement campaign obtained over 330 hours of data, the test was terminated early because of premature failure of the blade strain gauges. During the measurement campaign the Accurate Time Linked data Acquisition System (ATLAS) experienced numerous failures of individual components preventing truly continuous data acquisition for extended time periods. The ATLAS has been upgraded, the strain gauges have been reworked, and a second measurement campaign has begun. The system was operated from early February 2003 until early May with an availability of 95.6 percent. The new data set contains over 1630 hours of data. This manuscript describes the upgrades to the ATLAS, and then updates the data presented previously to illustrate the long-term, continuous operation of the ATLAS. Load and fatigue spectra are updated to illustrate their similarities and differences.

* Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin company, for the U.S. Department of Energy under contract DE-AC04-94AL85000.

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