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**FATIGUE CASE STUDY AND LOADING SPECTRA  
FOR WIND TURBINES\***

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**ABSTRACT** \*

The paper discusses two aspects of Sandia's Wind Energy Program. The first section of the paper presents a case study of fatigue in wind turbines. This case study was prepared for the American Society of Testing Material's (ASTM) Standard Technical Publication (STP) on fatigue education. Using the LIFE2 code, the student is lead through the process of cumulative damage summation for wind turbines and typical data are used to demonstrate the range of life estimates that will result from typical parameter variations. The second section summarizes the results from a workshop held by Sandia and the National Renewable Energy Laboratory (NREL) to discuss fatigue life prediction methodologies. This section summarizes the workshop discussions on the use of statistical modeling to deduce the shape and magnitude of the low-probability-of-occurrence, high-stress tail of the load distribution on a wind turbine during normal operation.

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