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NONDESTRUCTIVE EVALUATION (NDE) OF COMPOSITE/METAL BOND INTERFACE OF A WIND TURBINE BLADE USING AN ACOUSTO-ULTRASONIC TECHNIQUE*

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Abstract

An acousto-ultrasonic inspection technique was developed to evaluate the structural integrity of the epoxy bond interface between a metal insert and the fiber glass epoxy composite of a wind turbine blade. Data was generated manually as well as with a PC based data acquisition and display system. C-scan imaging using a portable ultrasonic scanning system provided an area mapping of the delamination or disbond due to fatigue testing, field operation conditions, or manufactured conditions of a turbine blade. Comparison of inspection data with a destructive visual examination of the bond interface to determine the extent of the disbond showed good agreement between the acousto-ultrasonic inspection data and visual data.

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