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**THE APPLICATION OF NON-DESTRUCTIVE  
TECHNIQUES TO THE TESTING OF  
A WIND TURBINE BLADE**

by

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**ABSTRACT**

NonDestructive Testing (NDT), also called NonDestructive Evaluation (NDE), is commonly used to monitor structures before, during, and after testing. This paper reports on the use of two NDT techniques to monitor the behavior of a typical wind turbine blade during a quasi-static test-to-failure. The two NDT techniques used were acoustic emission and coherent optical. The former monitors the acoustic energy produced by the blade as it is loaded. The latter uses electronic shearography to measure the differences in surface displacements between two load states. Typical results are presented to demonstrate the ability of these two techniques to locate and monitor both high damage regions and flaws in the blade structure. Furthermore, this experiment highlights the limitations in the techniques that must be addressed before one or both can be transferred, with a high probability of success, to the inspection and monitoring of turbine blades during the manufacturing process and under normal operating conditions.

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