

**FATIGUE DAMAGE ESTIMATE COMPARISONS FOR
NORTHERN EUROPEAN AND U.S. WIND FARM LOADING
ENVIRONMENTS***

H.J. Sutherland
Wind Energy Technology Department
Sandia National Laboratories
Albuquerque, New Mexico

N.D. Kelley
Wind Technology Division
National Renewable Energy Laboratory
Golden, Colorado

ABSTRACT

Typical loading histories associated with wind turbine service environments in northern Europe and within a large wind farm in the continental U.S. were recently compared by Kelley (1995) using the WISPER [Ten Have, 1992] loading standard and its development protocol. In this study, an equivalent load spectrum for a U.S. wind farm was developed by applying the WISPER development protocol to representative service load histories collected from two adjacent turbines operating within a large wind farm in San Geronio Pass, California. The results of this study showed that turbines operating in the California wind farm experience many more loading cycles with larger peak-to-peak values for the same mean wind speed classification than their European counterparts.

H. J. Sutherland and N. D. Kelley, "Fatigue Damage Estimate Comparisons for Northern European and U.S. Wind Farm Loading Environments," *Proceedings of WindPower '95*, AWEA, Washington, DC, March, 1995, pp. 177-186.

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