

PACKAGE ID - 001061IBMPC00 FAROW

KWIC TITLE - Fatigue and Reliability of Wind Turbines

AUTHORS - Veer, S.P.
Sandia National Laboratory, Albuquerque, NM (United States)

Winterstein, S.R.
Sandia National Laboratory, Albuquerque, NM (United States)

Lange, C.H.
Stanford University, Stanford, CA (United States)

Wilson, T.A.
University of New Mexico, Albuquerque, NM (United States)

LIMITATION CODE -COPY **AUDIENCE CODE** - LIM

COMPLETION DATE - 12/01/1994 **PUBLICATION DATE** - 11/01/1994

DESCRIPTION - FAROW is a computer program that assists in the probabilistic analysis of the Fatigue and Reliability of Wind turbines. The fatigue lifetime of wind turbine components is calculated using functional forms for important input quantities. Parameters of these functions are defined in an input file as either constants or random variables. The user can select from a library of random variable distribution functions. FAROW uses structural reliability techniques to calculate the mean time to failure, probability of failure before a target lifetime, relative importance of each of the random inputs, and the sensitivity of the reliability to all input parameters. Monte Carlo simulation is also available.

PACKAGE CONTENTS - Media Directory; Software Abstract; SAND94-2460;
Media Includes Executable, Sample Problem Input and Output;

SOURCE CODE INCLUDED? - No

MEDIA QUANTITY - 1 3.5 Diskette

METHOD OF SOLUTION - First and Second Order Reliability Methods (FORM/SORM) are used to solve the probabilistic problem for the reliability of wind turbine components with respect to fatigue. The failure state function includes a closed form solution for the integral equations of fatigue lifetime. (See User's Manual for details.)

COMPUTER - IBM PC

OPERATING SYSTEMS - DOS

PACKAGE ID - 001061IBMPC00 FAROW

PROGRAMMING LANGUAGES - FORTRAN

SOFTWARE LIMITATIONS - Accurate results are limited to probabilities of failure between 0.3 and $10 \text{ sup-}10$.

SOURCE CODE AVAILABLE (Y/N) - N

UNIQUE FEATURES - This is unique in that structural reliability methods are applied to the fatigue reliability methods of wind turbine structures. There are no similar packages that treat the fatigue of wind turbine components in a probabilistic manner and provide information on probability of failure, importance of input random variables and sensitivity of reliability to input quantities.

RELATED SOFTWARE - None

HARDWARE REQS - Only standard features.

TIME REQUIREMENTS - Time of Execution on a 486 PC is usually less than one minute.

REFERENCES - Veers, P.S., Winterstein, S.R., Lange, C.H., Wilson, T.A., User's Manual for FAROW: Fatigue and Reliability of Wind Turbine Components, SAND-94-2460, 11/94.

ABSTRACT STATUS - Released AS-IS 9/18/95.

SUBJECT CLASS CODE - T

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
F CODES
WIND TURBINES
MONTE CARLO METHOD
FAILURE MODE ANALYSIS

EDB SUBJECT CATEGORIES -
990200 170602

SPONSOR - DOE/CE

PACKAGE TYPE - AS - IS