Programmer's Guide for LIFE2's Rainflow Counting Algorithm

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ABSTRACT

The LIFE2 computer code is a fatigue/fracture analysis code that is specialized to the analysis of wind turbine components. The numerical formulation of the code uses a series of cycle count matrices to describe the cyclic stress states imposed upon the turbine. In this formulation, each stress cycle is counted or "binsed" according to the magnitude of its mean stress and alternating stress components and by the operating condition of the turbine. A set of numerical algorithms has been incorporated into the LIFE2 code. These algorithms determine the cycle count matrices for a turbine component using stress-time histories of the imposed stress states. This paper describes the design decisions that were made and explains the implementation of these algorithms using Fortran 77.