

Electromechanical Systems Reliability

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Abstract

Mechanical Reliability analysis is a technique for predicting the expected life and reliability of a mechanical system based on the reliability of the individual mechanical components. Mechanical designs are often one of a kind; therefore historical data from “similar” equipment is not always readily available for predicting performance reliability of the new equipment or its new application. The intent of this tutorial is to guide one through the basic steps of performing a mechanical reliability analysis. However, it is left up to the reliability analyst to select the most applicable techniques to use and which probability function best fits the mechanical equipment that is under evaluation. These techniques may be used to determine reliability improvements based on design changes if the design is not meeting the reliability goals. The most current mechanical reliability model selection guides will be provided. Also, small systems and Micro-mechanical reliability applications will be discussed.

Bio

Richard Doyle is a Registered Electrical and Civil Engineer in California and has a B.S. in Mechanical Engineering from Oregon State University and a M.S. in Engineering from the University of California, Irvine. Mr. Doyle has more than 30 years of experience in the theoretical analysis and design of electrical and mechanical systems, including consulting for the past 20 years in Aerospace, Commercial Electronics, and Nuclear Power Industries. He performed thermal/reliability analysis using computer simulations for different electrical systems such as Digital TV set top boxes, numerous power supplies, and Pentium, DSP, and ASIC ICs. He also taught Thermal Analysis of Electronics to graduate engineers working for the US Navy (Civil Service). He has also presented this tutorial many times at different locations. Mr. Doyle is a former president of the IEEE Reliability Society.