Preprint # 02-2

SAMPLE SIZE AND NUMBER OF FAILURE REQUIREMENTS FOR DEMONSTRATION TESTS WITH LOG-LOCATION-SCALE DISTRIBUTIONS AND TYPE II CENSORING

by

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March 2002

ABSTRACT

Reliability demonstration tests require demonstrating, with some level of confidence, that reliability exceeds a given standard. Demonstration tests can be expensive and time-consuming. Careful planning of sample size and test length are essential. This paper develops exact theoretical methods, based on pivotal quantities and and confidence intervals, to aid in proper sample size selection and determining how long the test should be run (in terms of how many units must fail before the test's end) for demonstration test with Type II censored data from log-location-scale (and the corresponding location-scale) distributions. The methods have been implemented in S-PLUS for the lognormal, Weibull, and loglogistic distributions to allow users to develop graphs depicting probability of successful demonstration as a function of reliability, a target reliability, sample size, and number of units failing for an assumed distribution.