



RELIABILITY EQUIVALENCE FACTORS OF A GENERAL SERIES-PARALLEL SYSTEM

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Abstract

The aim of this work is to generalize reliability equivalence technique to apply it to a general series-parallel system consists of n subsystems connected in series, and each subsystem i has m_i components connected in parallel system, with mixing life time and delayed time. We derive the reliability and mean time to failure of the original and improved systems according to reduction, hot duplication, cold and imperfect switch duplication methods, respectively. Reliability equivalence factor is introduced to compare different system. Two types of reliability equivalence factors of the system are obtained. Some special cases are introduced. Numerical results are provided to interpret how we can utilize the theoretical results obtained in this work and to compare the different reliability factors of the systems.

Keywords and phrases: reliability equivalence, series-parallel, reduction method, hot duplication, cold duplication, mixture lifetimes.

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