

# Reliability Evaluation of Socio-Technical Systems Considering Human Factor

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## Abstract

The problem of complex socio-technical systems reliability evaluation taking into consideration the hardware, software and human components of those systems is analyzed. In this paper we developed two mathematical models for the reliability analysis of redundant systems in the presence of hardware failures and human errors. Reliability, steady state availability, mean time to failure (MTTF) and variance of time to failure formulas are developed for both models. Markov techniques were used to obtain the resulting expressions. For both repairable and non-repairable systems, a Matlab code was written to solve differential equations implied in this analysis.

**Keywords:** System, socio-technical system, repairable system, reliability, availability, reliability evaluation, Markov model, Matlab

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