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## AN APPLICATION OF PHASE-TYPE DISTRIBUTIONS IN A RELIABILITY SHOCK MODEL

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ABSTRACT. Phase-type distributions have been found to be very useful in reliability, queueing theory, and some other operational research applications. In this work, we define a new mixed shock model and study lifetime properties of the corresponding system using phase-type distributions. The system under concern fails upon the occurrence of  $k$  consecutive shocks of size at least  $d_1$  or a single large shock of size at least  $d_2$ ,  $d_1 < d_2$ . In particular, using closure properties of phase-type distributions, we obtain survival function and mean time to failure of the system. Optimal replacement time is also studied.

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