

**Title:**

**The Restart Queue Model**

**Authors:**

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**Abstract:**

**Consider the classical single server queueing system having three different types of possible catastrophes represented by new states:  $-3$ ,  $-2$ ,  $-1$ . The recovery rates from these catastrophes vary and are dependent upon the severity of the occurring catastrophe. When a catastrophe occurs, the system undergoes a restart birth sub-process that leads to the underlying single server system with no customers present. The transient probability functions of this system are determined using dual processes, lattice path combinatorics and randomization. Our solution approach also works to solve systems having similar but more general multiple-catastrophe configurations.**