Abstract

We consider a G/M/1 queue with restricted accessibility in the sense that the maximal workload is bounded by 1. If the current workload $V_t$ of the queue plus the service time of an arriving customer exceeds 1, only $1 - V_t$ of the service requirement is accepted. We are interested in the distribution of the idle period, which can be interpreted as the deficit at ruin for a risk reserve process $R_t$ in the compound Poisson risk model. For this risk process a special dividend strategy applies, where the insurance company pays out all the income whenever $R_t$ reaches level 1. In the queueing context we further introduce a set-up time $a \in [0, 1]$. After every idle period, when the queue is empty, an arriving customer has to wait for $a$ time units until the server is ready to serve the customer.