Summary: This paper considers the optimal management problem of a finite-capacity M/M/1/K queueing system with subject to server breakdowns. When the number of customers reaches its capacity $K$, no further arriving customers are allowed to enter the system. Customers are allowed to the system with probability $p$ or the customers are still unable to enter the system with probability $1 - p$ as the queue length decreases to a certain threshold value $F$. By applying the birth-and-death process, some important performance measures are derived. A cost model, developed to determine the optimal continuous and discrete control parameters for the $(p, F)$-policy at a minimum cost, and sensitivity analysis are also studied.

Keywords: queueing system; server breakdowns; optimal control