

Ringdown Time Characterization in a 911 Public Safety Emergency Response System using Stochastic Simulation

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Abstract: In public safety Emergency Response Systems (ERS), expeditious call processing is vital at offering adequate and ideal response to serve emergency needs within the community, providing with contention public safety resources to protect the integrity of inhabitants under risk. Generally, response time in an ERS, is referred to the time period from the moment a call for service is received to the time a service unit arrives to the site where it is required. Our research considers as a reference the performance standard of three minutes maximum response time established by the National Advisory Commission on Criminal Justice in the United States of America for a 90% service level. However, ringdown time, which is the time a phone rings before it is answered, according to the U.S.A. Department of Justice Statistics, Bureau of Justice Statistics, is not included in the basic concept of response time. Nevertheless, it is in fact an initial waiting time of the caller previous to the point where the call is answered, and is or should be considered in the design of infrastructure of an ERS call center in terms of the number of incoming phone lines and the number of call answering agents to meet minimum or ideal performance levels. Our research presents an analysis of the expected ringdown time of incoming calls to an ERS using discrete event stochastic simulation for a public safety ERS in México. In previous research of the ERS of interest there were identified extended response times and it is our interest to optimize the incoming calls process by minimizing ringdown time as a function of ideal allocation of resources in the call center of the ERS. The simulation model generated multiple performance parameters and operating strategies are provided.

Keywords: Public Safety, Emergency Response System, Call Center, Ringdown Time, Response Time.