

A SIMULATION MODEL FOR AIRCRAFT MAINTENANCE IN AN UNCERTAIN OPERATIONAL ENVIRONMENT

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Abstract: We present a discrete-event simulation model for maintenance operations of a fleet of fighter aircraft in crisis situations, where the fleet operations are affected by a threat of an enemy's actions. The model describes the flight process and basic modes of periodic maintenance and failure repairs. Features that are specific to crisis situations include battle damages of the aircraft, decentralization of airbases, specialized maintenance personnel and spares supply. Construction and validation of the model are based on expert knowledge and statistical data on actual flight and maintenance operations in peacetime conditions. The main use of the model is the evaluation of different maintenance strategies in elevated states of readiness and in presence of hostile activities. Built with a graphical simulation software the model provides an easily manageable tool for maintenance designers. In addition, it offers a valuable educational aid in training maintenance personnel by demonstrating the implications of airbase maintenance and logistics activities to fleet performance.

Keywords: Aircraft, maintenance, discrete-event simulation, logistics