

ABSTRACT

Doctoral dissertation is devoted to the development of a method for assessing the maintainability of military aircraft. The main role in the presented method is played by the estimation of the time of individual maintenance tasks included in the selected periodic inspection and defining the schedule for the implementation of this inspection. The method is based on the use of a proprietary mobile application for data acquisition from the operation of aircraft and the developed universal algorithm for scheduling military aircraft periodic inspection.

In practice, the tests were carried out by identifying the probability distributions for individual maintenance tasks, arranging the maintenance inspection schedule and estimating the probability distribution for the prepared schedule. For each of the examined maintenance task, the coefficient of determination R^2 was calculated for the four considered theoretical probability distributions. Then, the distribution type with the best fit to the data sample was selected and the distribution was verified using the Kolmogorov conformance test. Based on the identified probability distribution, the duration of a single maintenance task was estimated. Based on the estimated times and the developed universal algorithm for scheduling military aircraft inspection, the considered inspection schedule was prepared.

The dissertation also presents the results of the verification of the developed method, based on conducted researches and the Monte-Carlo method, the duration of the maintenance periodic inspection under consideration was estimated. The performed calculations and simulations were compared with historical data of completed inspections and the impact of the developed method on the technical availability of the research object was determined.

It is expected that the developed universal algorithm for scheduling military aircraft periodic inspection and the mobile application will be used in the Polish Air Force. The method can be implemented as one of the modules of the IT system supporting the aircraft operation, eg. SI SAMANTA. The introduction of the developed method in the Poland's Military Aviation would result in faster and more effective implementation of periodic inspections, increasing the level of technical readiness of military aircraft.

Keywords: maintainability, technical availability, mobile application.