

Summary of dissertation

"The impact of the on-board data recording system on the flight safety of the aircraft"

Continuous development of air transport all over the world, imposes on air carriers and airline operators the obligation to perform their aviation tasks while maintaining the required level of safety. Therefore increasing flight safety is a priority for modern aviation organisations, both in the field of civil and state aviation. The work included an analysis of the flight safety system in the aviation organisation with regard to the use of FDR system data and showed differences in data management systems in civil and state aviation. The use of FDR data is important not only to ensure that and improving the safety system, but also in the prevention of aviation incidents. For those reasons, it is extremely important to obtain objective data from the FDR system with the required level of accuracy in the recording and reading of flight parameters.

The study was undertaken to identify the sources of errors in the FDR data management system and the accuracy of measurement of flight parameters by the aircraft flight recorder system. Within the framework of the dissertation, the research was carried out on the basis of collected data in the instrument speed measurement circuits and barometric height in which the measuring element were potentiometric sensors. The analysis included databases of flight parameters of aircraft and diagrams of sensors calibrations for the above mentioned parameters. As a result of the analysis, it was determined that there are disturbances in the characteristics of sensors in the measuring circuits causing the occurrence of significant measurement errors in the measured flight parameters. The dependence of the error rate of the flight parameter to be measured on the technical condition of the measurement sensor in the recorder system and the correctness of the sensor scaling procedure was identified.

The practical purpose of the work was to develop a diagnostic tool enabling verification of technical condition and scaling of potentiometric sensors used in measuring lines of barometric height H_b and instrumental velocity V_p . The essence of testing potentiometric sensors is to measure a parameter in real time, verify and compare it with the values of parameters taken as standard parameters loaded into the memory of the test stand. Measurement of the resistance (or voltage) value of the sensor as a function of changes in the physical value of the measured parameter is carried out with a sampling frequency of 10 Hz.

On the basis of the research of potentiometric sensors of H_b and V_p parameters performed

with the use of a developed diagnostic tool, it was stated that this diagnostic method allows to verify the technical condition of potentiometric sensors by identifying existing and potential aircraft malfunctions during their current operation and at the stage of technical maintenance.

Obtained results of the research allowed to achieve the aim of the work and confirm the validity of the accepted thesis.

KEYWORDS:

A flight safety scheme,

Flight data recorder,

Potentiometric sensor,

Objective flight control,

Record the flight parameter,

Accuracy of measurement of the flight parameter