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Abstract of PhD dissertation entitled

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

Ensuring the required acceptable level of safety in aviation and improvement of the safety management system are a priority in the performance of aviation tasks. In the dissertation, the research process included the analysis of the FDR data management system and its use in the flight safety management system of aviation organisations. The data obtained from the analysis allowed to state that that airborne flight data recording systems are the main source of objective and reliable data (information) used in flight safety systems. In order to ensure the objectivity of the measurement of the flight parameter, the FDR measurement sensors shall comply with specific requirements regarding the accuracy of the measurement of the flight parameter and the scaling process methodology.

The practical aim of the dissertation was to develop a method of calibration and assessment of the technical condition of the sensors of the on-board data recording system for the purpose of achieving an acceptable level of aircraft safety. The paper presents the method of scaling the potentiometric sensors of flight parameters, which allows to measure the characteristics of the sensor and check the technical condition at the same time. Using a test stand made for this purpose, potentiometric sensors of the FDR system in measuring paths of instrumental speed and barometric altitude were tested. The results obtained during the tests confirmed the effectiveness of the developed method of scaling the FDR measurement sensors and the possibility of using the test stand as a diagnostic tool to assess the technical condition of potentiometric sensors. The technical solution of the diagnostic tool presented in the work allows to increase the accuracy of measurement of flight parameters and to shorten the time of data delivery to the flight safety system. It also has the ability to upgrade the application and expanding the interface of the testing device for other measurement tracks of the FDR system and to diagnosing other aircraft systems.