

ASSEMBLY — 35TH SESSION

TECHNICAL COMMISSION

Agenda Item 24: ICAO Global Aviation Safety Plan (GASP)

USE OF FLIGHT RECORDER DATA

(Presented by the Russian Federation)

SUMMARY

This paper sets forth proposals on measures aimed at increasing the level of flight safety, based on the further extension and improvement of the use of flight recorder data to monitor compliance with regulations for flights and technical operations, as well as the status of aircraft equipment.

Action by the Assembly is in paragraph 3.

REFERENCES

Resolution A33-10
Annex 6, Part I, paragraph 3.2.3
Doc 9753 AIG/99

1. INTRODUCTION

1.1 Flight recorders currently installed on aircraft record a large number of analogue parameters and binary signals which describe the attitude of aircraft, the actions of the crew and the operation of aircraft equipment; therefore, it is justified to raise the question of using this information not only for investigating the causes of aircraft accidents or incidents, but also for operational purposes.

1.2 Operational experience shows that a timely and complete analysis of information from flight data recorders (FDR) significantly contributes to increasing flight safety by enabling the detection of pre-failure states of aircraft equipment, the assessment of resource consumption, the monitoring of compliance with regulations on the in-flight operation of equipment, and the performance of many other operational tasks.

2. DISCUSSION

2.1 Requirements, prescribing the mandatory processing of flight recorder data in accordance with standard methodologies and programmes, have been in force for operators in Russia since the 70's.

2.2 A standard has been established for the mandatory processing of recordings upon the return of an aircraft to base, or for some other types of aircraft, at an intermediate airport also.

2.2.1 Strictly regulated methodologies and special software for the mandatory processing of flight data have been developed for each type of gas turbine aircraft of a maximum take-off mass in excess of 5 700 kg. This makes it possible to avoid arbitrary actions when assessing the flight crew's actions and the operation of aircraft equipment.

2.2.2 The methodologies and special software contain at least two modules:

2.2.2.1 The module for assessing the regulations for the in-flight operation of aircraft equipment, based exclusively on the requirements and recommendations of the flight manual;

2.2.2.2 The module for monitoring the operation of aircraft equipment (monitoring of operating parameters and analysis of binary signals).

2.2.3 Other modules can also be included to perform some special tasks, such as the assessment of loads acting on the structure during flight, or the monitoring of the operation of separate systems.

2.3 An industry flight recorder database on failures of aircraft equipment and violations of operational regulations has currently been introduced and is being enhanced in Russia. The database includes:

- Addressed information on the failure of aircraft equipment or on the nature of the violation of operational regulations, including a coded event number, the identification number of the aircraft, the date of the flight, and the flight number;
- In a regulated manner for each type of recorder, a fragment of the recording related to the period in which the event occurred.

2.3.1 The database is developed with information from operators which is periodically sent to a common centre. The contents of the database are used to prepare recommendations on the development of training programmes for flight and technical personnel, as well as industry-wide and airline-specific operational documentation. The database is also used to enhance methods for identifying failures using flight recorder data, and assists in more precisely defining the requirements for aircraft equipment and methods for diagnosing its status.

2.3.2 The systematized results of processing the information in the industry database are sent to operators for their everyday use.

2.4 ICAO recognizes that the use of flight recorder data is highly effective in ensuring flight safety and preventing aircraft accidents. For these purposes, ICAO adopted a Standard which establishes the requirement to introduce and implement flight recorder data analysis programmes. From 1 January 2005, operators of aircraft of a maximum certificated mass in excess of 27 000 kg will be required to implement these programmes.

2.5 With the entering into effect of that Standard, more detailed guidance material is required, in addition to the already existing general ICAO recommendations on the Standard's implementation.

2.5.1 Resolution A31-10 "Improving accident prevention in civil aviation" imposes on Contracting States the obligation to undertake every effort to enhance accident prevention measures "so as to meet the new challenges in managing flight safety". Guidance material on a model programme and a methodology for analysing flight recorder data on the operation of aircraft equipment and flight operations should be developed to respond to such an approach.

2.6 Commercial air carriers performing the bulk of world air services possess an aircraft fleet which consists mainly of aircraft of a maximum certificated mass of 9 000 kg or more. In addition, the percentage of the aircraft fleet of a maximum certificated mass in the range of 9 000 kg to 27 000 kg is fairly high.

2.6.1 As an example, 30% of the total Russian civil aircraft fleet is comprised of aircraft of a maximum certificated mass in the range of 9 000 kg to 27 000 kg. This range includes over 1 200 helicopters, which represent approximately two-thirds of the available fleet of helicopters.

2.6.2 These circumstances raise the issue of extending the effect of the Standard which establishes the requirement to introduce and implement programmes for the analysis of flight data to aircraft of a maximum certificated mass in the range of 9 000 kg to 27 000 kg.

3. ACTION BY THE ASSEMBLY

3.1 In the light of what has been presented in paragraphs 2.4 to 2.6 of this paper, the Assembly is invited to request the Council of ICAO to set the required priority and allocate resources to address the following issues.

- a) Development of a model programme and methodology for analysing flight recorder data on the operation of aircraft equipment and flight operations;
- b) Implementation of programmes for the analysis of flight recorder data by all operators of aircraft of a maximum certificated mass of 9 000 kg or more.