Barbados Civil Aviation Department

BCAD Document AAC-024

AIRWORTHINESS

ADVISORY

CIRCULAR

FLIGHT DATA RECORDERS

FLIGHT DATA RECORDERS

MONITORING OF FLIGHT DATA RECORDERS

SECTION 1. BACKGROUND

1. OBJECTIVE.

This chapter provides guidance for monitoring flight data recorders (FDRs), to ensure that performance levels are maintained.

2. GENERAL.

A. Definitions:

(1) Flight time (airplanes): The time from the instant the airplane begins the takeoff roll until the airplane has completed the landing roll.

(2) Flight time (rotorcraft): The time that the rotor-craft begins liftoff until the time that the rotorcraft has landed at its destination

B. A review of data extracted from FDRs has shown a significant loss of data during takeoffs, touchdowns, flights through turbulence, and unusual vibration situations. Due to these data losses, Inspectors will ensure that an Operator's monitoring procedures and inspection schedules will maintain the required FDR performance levels.

C. State-of-the-art advancements in certain digital FDRs incorporate the use of continuous self-monitoring and fault condition alert capabilities. These types of digital FDRs are being accepted by airlines as new or direct replacements for foil recorders.

D. FDR Regulatory Requirements .

(1) Civil Aviation (Instrument & Equipment) Regulations, 33 (2) *(a) (b) & (c)* requires that all aeroplanes of 5700kg or over be equipped with an approved Type I, IA or II digital FDR, as applicable, capable of utilizing a digital method of recording and storing data and a method of readily retrieving that data from the storage medium.

(2) Civil Aviation (Instrument & Equipment) Regulations, 33 (6) requires that multi-engined turbine-powered aeroplanes 5700kg or less be equipped with an approved Type IIA digital FDR, capable of utilizing a digital method of recording and storing data and a method of readily retrieving that data from the storage medium.

(2) Civil Aviation (Instrument & Equipment) Regulations, 33 (7) *(c)* and 33 (8) requires that all helicopters above 3,180kg be equipped with an approved Type IVA digital FDR, as applicable, capable of utilizing a digital method of storing data and a method of readily retrieving that data from storage medium.

(4) Civil Aviation (Aircraft Operations) Regulations, 75 (3) requires that in the event of an accident, the pilot-in-command shall act to preserve the recorded data for

subsequent submission to the DCA as may be requested to conduct an investigation.

(5) Civil Aviation (Instrument & Equipment) Regulations, 29 (1) *(b)* requires operators to ensure that FDRs are calibrated where required by the DCA.

(6) Civil Aviation (Instrument & Equipment) Regulations, 29 (8) requires operators to conduct operational checks on FDRs once every 12 months to ensure continued serviceability.

(7) Civil Aviation (Air Operator Certification & Administration) Regulations, 91 requires a national operator to retain the most recent FDR calibration, including the recording medium from which this calibration is derived and the FDR correlation for one aircraft of any group of aircraft operated by the national air operator.

(8) Civil Aviation (Instrument & Equipment) Regulation 35 and Standard 6.6 require that FDRs shall be capable of retaining the recorded information recorded during at least the last:

(1). Type I and II – 25 hours of operation
(2). Type IIA – 30 minutes of operation
(3). Type IV, IVA and V – 10 hours of operation

SECTION 2. PROCEDURES

1. PROCEDURES.

Perform the Inspection .

(1) Determine the type of FDR currently in operation.

(2) Evaluate the maintenance program. Accomplish the following:

(a) Ensure that the FDR system test program is accomplished in accordance with the manufacturer's recommendations or an approved equivalent method.

(b) Verify that the continuous self-monitoring and fault condition alert capabilities (digital FDRs) will detect the loss or deterioration of input signals before periodic readouts are allowed to be waived.

(c) Ensure that the performance levels for ranges, accuracies, and recording intervals are maintained by periodic FDR bench checks and detailed analysis of recording tapes.

(d) Review the FDR, computer readouts, ramp test set readouts, and compare for the following:

- Missing parameters
- Data loss
- Deterioration of signals

NOTE: ***Periodic readouts can be waived if not required by the maintenance review board.***

(e) Review the maintenance procedures for acoustic underwater locator beacons. The manufacturer's recommendations must be closely followed, including the procedures for the battery check.

(f) Ensure that the digital FDR ramp equipment, if used, can detect the loss or deterioration of input signal from sensors or transducers before periodic readouts are allowed to be waived.

(g) Ensure that the manual includes procedures that prevent the destruction of recorded data from the removed unit until the aircraft has accumulated the appropriate amount of operating time for that type of aircraft.

(h) Ensure that the performance levels for ranges, accuracies and recording intervals are maintained.

(3) Inspect the record keeping system. Accomplish the following:

(a) Ensure that the most recent instrument calibration and recorder correlation is being retained on premises, to include the recording medium from which this calibration is derived.

(b) Review the FDR readouts and calibration records for the following:

- Missing parameters
- Data loss
- Deterioration of signals

(c) Examine the FDR readouts to ensure that the actual data recorded is as required by Standard 6.2.