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Advisory Circular to Air Operators

GUIDANCE ON THE ESTABLISHMENT OF A FLIGHT DATA ANALYSIS (FDA) PROGRAMME

1. PURPOSE

a. This Advisory Circular provides information and guidance to air operators and DCA staff for the establishment of a Flight Data Analysis (FDA) programme.

2. RELATED CIVIL AVIATION REGULATIONS

a. Myanmar Aircraft Rules (1937).
b. Myanmar Civil Aircraft Requirements Part – 8 (Operations)

3. BACKGROUND

a. A Flight Data Analysis (FDA) programme is a pro-active and non-punitive programme for gathering and analyzing data recorded during routine flights to improve aviation safety. (Such programmes may also be called Flight Data Monitoring (FDM) or Flight Operations Quality Assurance (FOQA) or similar.) FDA programmes are an integral component of a mature safety management system. The use of this important safety tool is increasing as technology improvements expand the capabilities for gathering and analyzing such recorded data. Random collection and analysis of data provides valuable information to improve safety with the ultimate aim of reducing the number of accidents. The information and insights provided by FDA can improve safety by identifying safety hazards, enhancing training effectiveness, and improve operational, maintenance, engineering, and air traffic control procedures.

b. Recognizing the accident prevention potential of FDA programmes, Amendment 26 to ICAO Annex 6, Part I requires that, from 1 January 2005, an operator of an aeroplane of a maximum certificated take-off mass in excess of 27 000 kg shall establish and maintain a flight data analysis programme as part of its accident prevention and flight safety programme.

4. SCOPE

a. The scope of this AC is to provide guidance to DCA and air operator staff for the implementation of an effective Flight Data Analysis programme.

5. Objectives of a FDA programme

a. To identify undesirable and unsafe trends;

b. The identification of operational hazards in specific procedures, fleet, airports and air traffic control procedures;

c. To determine the frequency of occurrences which when combined with an estimation of the level of severity, provide for an assessment of the safety risks involved in order to determine which may become unacceptable if the trend continues;

d. To put in place appropriate risk mitigation measures to alleviate any present or predicted unacceptable risk;

e. To monitor results of mitigation measures and to adjust such measures as required; and

f. To verify and optimize the effectiveness of training programmes and SOPs.

6. Basic Requirements of a FDA Programme

a. The manager of an operator's FDA programme, is responsible for identifying issues of concern and for informing the manager responsible for the process concerned. The latter is accountable for taking appropriate and practicable safety action within a reasonable period of time.

Note: While an operator may contract the operation of a flight data analysis programme to another party, the overall responsibility for the FDA programme remains with the manager of the air operator's Flight Safety Programme.

b. In a FDA program, recorded data is removed from the aircraft by several methods, such as Quick Access Recorders (QAR) or directly from the Flight Data Recorder (FDR). The recorded data is periodically retrieved and sent to the air operators FDA office for analysis. This office usually resides within the flight safety organization at the air operator. The data is then verified and analyzed, utilizing specialized processing and analysis software designed to convert the flight data into usable information.

c. The analysis software extracts FDA events from the raw data, based on parameters and associated threshold values (e.g., descent rate in excess of 1000 feet per minute on approach) that are specified by the air operator. Events are normally filtered by phase of flight. The analysis typically focuses on events that fall outside normal operating boundaries, as determined by the air operator's operational standards, as well as the aircraft manufacturer's limitations. The FDA office then reviews the events to assess their validity and their potential significance.

d. Unless an FDA event requires immediate action in the interest of safety, significant FDA events will be aggregated for further review by an oversight committee typically comprised of representatives from the appropriate air operator departments, such as flight operations, flight standards and training, and aircraft maintenance as well as representative(s) of flight crews.

e. Data that could identify flight crewmembers are removed from the electronic record as part of the initial event extraction process. However, FDA programs typically include a crew liaison officer who is normally provided with a secure means of determining crew identity to enable follow-up inquiry and feedback with a particular flight crew concerning a particular FDA event. The crew liaison officer should be someone who has the confidence of crewmembers and managers for their integrity and good judgment. This person provides the link between fleet or training managers and the flight crew involved, in circumstances highlighted by FDA.

f. Appendix A outlines examples of typical events which could be included in an air operator's FDA programme.

7. APPLICABILITY

Air operators should consider the information contained in this AC when developing their FDA programmes.

Director General
Department of Civil Aviation

Appendix A

Examples of Typical FDA Programme Exceedance Detection and Routine Parameter Analysis

1. Traditional Event Set

These operational events are typical of those found in most software packages; however events should be tailored to the specific needs/peculiarities of the air operator and its operation.

Event Group	Event Code	Description
Flight Manual Speed Limits	01A	Vmo exceedance
	02A	Mmo exceedance
	03A	Flap placard speed exceedance
	03G	Gear down speed exceedance
	03I	Gear up/down selected speed exceedance
Flight Manual Altitude Limits	04	Exceedance of flap/ slat altitude
	05	Exceedance of maximum operating altitude
High Approach Speeds	06A	Approach speed high within 90 sec of touchdown
	06B	Approach speed high below 500 ft AAL
	06C	Approach speed high below 50 ft AGL
Low Approach Speed	07A	Approach speed low within 2 minutes of touchdown
High Climb-out Speeds	08A	Climb out speed high below 400 ft AAL
	08B	Climb out speed high 400 ft AAL to 1000 ft AAL
Low Climb-out Speeds	08C	Climb out speed low 35 ft AGL to 400 ft AAL
	08D	Climb out speed low 400 ft AAL to 1500 ft AAL
Take-off Pitch	09A	Pitch rate high on take-off
Unstick Speeds	10A	Un-stick speed high
	10B	Un-stick speed low
Pitch	20A	Pitch attitude high during take-off
	20B	Abnormal pitch landing (high)
	20C	Abnormal pitch landing (low)
Bank Angles	21A	Excessive bank below 100 ft AGL
	21B	Excessive bank 100 ft AGL to 500 ft AAL
	21C	Excessive bank above 500 ft AGL
	21D	Excessive bank near ground (below 20 ft AGL)
Height Loss in Climb-out	22D	Initial climb height loss 20 ft AGL to 400 ft AAL
	22E	Initial climb height loss 400 ft to 1500 ft AAL
Slow Climb-out	22F	Excessive time to 1000 ft AAL after take-off
High Rate of Descent	22G	High rate of descent below 2000 ft AGL
Normal Acceleration	23A	High normal acceleration on ground
	23B	High normal acceleration in flight flaps up/down
	23C	High normal acceleration at landing
	23D	Normal acceleration; hard bounced landing
Low go-around	024	Go-around below 200 ft
RTO	026	High Speed Rejected take-off
Configuration	40C	Abnormal configuration; speed brake with flap
Low Approach	042	Low on approach
Configuration	43A	Speed-brake on approach below 800 ft AAL
	43B	Speed-brake not armed below 800 ft AAL (any flap)
Ground Proximity Warning	44A	GPWS operation - hard warning
	44B	GPWS operation - soft warning
	44C	GPWS operation - false warning
	44D	GPWS operation – wind-shear warning
Margin to Stall	45A	Reduced lift margin except near ground
	45B	Reduced lift margin at take-off
	46A	Stick-shake
	46B	False stick-shake
Configuration	047	Early configuration change after take-off (flap)
Landing Flap	48A	Late land flap (not in position below 500 ft AAL)
	48B	Reduced flap landing
	48D	Flap load relief system operation
Glideslope	56A	Deviation under glide-slope
	56B	Deviation above glide-slope (below 600 ft AGL)
Buffet Margin	061	Low buffet margin (above 20,000 ft)
Approach Power	75A	Low power on approach

2. New Operational Event Program Triggers

In addition to the traditional events detailed above there could be a number of new events used to detect other situations which an air operator may be interested in. Some of the new triggers are relatively simple to implement while others would need careful coding and research to avoid false events while still activating against good data.

Description	Notes
Engine parameter exceedance (eg. TGT etc)	One of a range of engine monitors
Full and free control checks not carried out	Essential pilot actions and a measure of control transducers.
Taxi out to take-off time - more than (x) minutes	Can be measured against a standard time for that airfield and runway.
High Normal Acceleration -Rough taxi-way	Detection along with an estimate of position derived from groundspeed and heading.
High Longitudinal Acceleration - Heavy braking	as above
Excessive Taxi Speed	as above
Take-off configuration warning	
Landing gear in transit longer than (x) seconds	To be used as an indicator of system problems and wear
Flap/slats in transit longer than (x) seconds	as above
Master Warning	All master warnings, even if false, heard by the crew are a useful indicator of distractions and "mundane/known problems".
Engine failure	To determine crew performance as well as help technical investigation.
Autopilot vertical speed mode selected below (x) ft	One of a range of auto flight system usage monitors
Fuel Remaining at landing below minimums	
Airborne holding - more than (x) minutes	
Excessive control movement - airborne (especially rudder)	This will indicate control problems that other events might not identify
TCAS warning	A must for monitoring future significant hazards and crew reactions
Reverse thrust not used on landing	
Auto ground spoiler not selected for landing	
Landing to shutdown time - more than (x) minutes	Indicates taxiway or stand allocation problems