International Civil Aviation Organization (ICAO)

Regional Aviation Safety Group
(Asia & Pacific Regions)

Asia Pacific Regional Aviation Safety Team

GUIDANCE ON THE ESTABLISHMENT OF A FLIGHT DATA

ANALYSIS PROGRAM (FDAP)

developed by

Singapore Airlines

Executive Summary

The purpose of this SEI is to develop and implement a non-punitive FDA program to promote compliance with the Annex 6, Part 1 requirement regarding establishment of non-punitive FDA program.

This model advisory circular (AC) provides information and guidance to Air Operators for the establishment of a Flight Data Analysis Program (FDAP).

Version 1 dated 04 Sep 2015

Preamble

Background on Regional Aviation Safety Group – Asia & Pacific (RASG – APAC)

The Regional Aviation Safety Group Asia-Pacific (RASG-APAC) was established in 2011 by the Council of ICAO. The RASG-APAC is tasked with improving aviation safety in the Asia & Pacific regions by developing and implementing a work programme, in line with the ICAO Global Aviation Safety Plan, aimed at identifying and implementing safety initiatives to address known safety hazards and deficiencies in the region.

The Asia Pacific Regional Aviation Safety Team (APRAST), a sub-group of the RASG-APAC, assists the RASG-APAC in its work by recommending safety interventions which will reduce aviation safety risks.

The full commitment and active participation of APAC States/Administrations and the industry partners is fundamental to the success of the RASG-APAC in reducing aviation safety risks and accident rates in the Asia and Pacific regions.

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CFIT-4 SAFETY ENHANCEMENT INITIATIVE

MODEL ADVISORY CIRCULAR FOR THE ESTABLISHMENT OF A

FLIGHT DATA ANALYSIS PROGRAM (FDAP)

Introduction

1   The purpose of this SEI is to develop and implement a non-punitive FDA program to promote compliance with the Annex 6, Part 1 requirement regarding establishment of non-punitive FDA program.

Background of Safety Enhancement Initiative (SEI)

2   ICAO Annex 6 Part 1 Chapter 3 requires operator of an aeroplane of a maximum certificated take-off mass in excess of 27 000kg shall establish and maintain the FDAP as part of its accident prevention and flight safety program from 1 January 2005.

3   Flight Data Analysis Program (FDAP) is a continuous pro-active safety program that utilizes Quick Access Recorder (QAR) data to collate and analyze digital flight data in routine line operations. The program is also known as the Flight Data Monitoring (FDM) or Flight Operations Quality Assurance (FOQA). It is mainly used to identify adverse safety trends from Flight Operations and enable corrective actions can be introduced before unsafe trend leads to accidents.

4   Data gathered can also be analyzed to improve crew performance, operating procedures, flight training, air traffic control procedures, air navigation services, or aircraft maintenance and design.

5   In Incident Investigation, the FDAP provides the Quantitative description of the event supplementing the Contextual crew report.

6   Additionally, flight profile and engine operations parameters can also be collated through FDAP for the operator's maintenance program and as part of the continuing airworthiness program to monitor, analyze and improve operational efficiency as part of continuing airworthiness. This represents a separate part the FDAP program which is distinct from flight parameters exceedence detection.

Applicability to States/ Industry

7   This paper proposes a Model Advisory Circular (AC) for the establishment of a Flight Data Analysis Program (FDAP). All air operators should review these guiding principles for the implementation and management of an effective Flight Data Analysis Program.

SEI Phases/ Contents

8   Broadly, the phases for this SEI project are simplified below:

    a. Output 1

Goal: Develop generic principles on the management of collection of information to prevent use of the data collected under FDAP from inappropriate use against the airlines or their employees.

b. Output 2
Goal: Analyze all guidance materials currently available and develop an Advisory Circular outlining the standards and guiding principles for the establishment and implementation of FDAP.

c. Output 3
Goal: States to issue Model Advisory Circular and monitor status of implementation by air operators. States to confirm air operators have developed and implemented an effective FDA program.

Action/ Comments by RASG

9   The meeting is requested to approve the above CFIT-4 SEI Model AC on establishment of a Flight Data Analysis Program (FDAP).

ADVISORY CIRCULARS FOR AIR OPERATORS

SUBJECT: **GUIDANCE ON THE ESTABLISHMENT OF A FLIGHT DATA ANALYSIS PROGRAM (FDAP)**

DATE: **DD-MM-YEAR**

1.   PURPOSE

1.1   This advisory circular provides information and guidance to Air Operators for the establishment of a Flight Data Analysis Program (FDAP).

2.   APPLICABLE REGULATIONS

2.1   *(Insert State Regulations)*

3.   BACKGROUND

3.1   ICAO Annex 6 Part 1 Chapter 3 requires operator of an aeroplane of a maximum certificated take-off mass in excess of 27 000kg shall establish and maintain the FDAP as part of its accident prevention and flight safety program from 1 January 2005.

3.2   Flight Data Analysis Program (FDAP) is a continuous pro-active safety program that utilizes Quick Access Recorder (QAR) data to collate and analyze digital flight data in routine line operations. The program is also known as the Flight Data Monitoring (FDM) or Flight Operations Quality Assurance (FOQA). It is mainly used to identify adverse safety trends from Flight Operations and enable corrective actions can be introduced before unsafe trend leads to accidents..

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4.   SCOPE

4.1   The scope of this AC is to provide guiding principles to Air Operators for implementation and management of an effective Flight Data Analysis Program.

5.   OBJECTIVES OF A FLIGHT DATA ANALYSIS PROGRAM

5.1   **Identification of Undesirable and Unsafe Trends through Exceedence Detection and Routine Operational Measurements**

5.1.1   FDAP enables analysis of flight data to identify areas of operational risk through a pro-active and routine collation of a pre-determined core set of flight parameter exceedances. These de-identified non-standard flight operations, deviation from prescribed operating procedures and unsafe circumstances can be detected and quantified into undesirable and unsafe trends for remedial action(s) to be taken.

5.1.2   De-identified exceedence detection data gathered and lessons learnt are shared with the operator's flight crew for risk awareness.

5.1.3   The FDAP also enables the continued monitoring of the effectiveness of remedial actions introduced.

5.2   **Incident Investigation**

5.2.1   FDAP provides quick and valuable quantifiable recorded data for safety investigation of mandatory reportable incidents. FDAP captured flight parameters, performance and system status assist in concluding the cause and effect of the event.

5.2.2   In the safety investigation of mandatory reportable incidents, the FDAP's protocol of data confidentiality would not apply as crew narrative of the incident providing the context of the incident and the applicable specific human factor issues contributing to incident plays an integral part of the investigation.

5.2.3   Additionally, in the event that the FDAP reveals a flight profile and/or operating parameters that are classified as a mandatory reportable incident under ICAO Annex 13 or applicable State Regulation(s), the event must be immediately identified and incident report filed accordingly and investigated by the operator.

5.3   **Continuing Airworthiness**

5.3.1   Routine and specific event data from the FDAP can be utilized as an integral part of an operator's continuing airworthiness function as required under ICAO Annex 8. The data are analyzed to ensure that the operator's aircraft are in a condition for safe and efficient operation.

5.3.2   FDAP can also be used by the operator as an engine-monitoring program to analyze engine performance and its efficiency. Other use of the data includes airframe drag measurements, avionics and other system performance monitoring, flight control performance, taxi fuel monitoring, brake and reverse thrust usage.

5.3.3   Routine or specific event data acquired from FDAP for continuing airworthiness forms part of the operator's maintenance and efficiency program and are separate from the flight parameters exceedence detection and safety trend data collection. Therefore, the extent and dimension of data collection in this category remains solely at the discretion of the operator provided the non-punitive and confidentiality aspect of the FDAP is maintained.

5.4   **Integrated Safety Analysis**

5.4.1   FDAP data should be kept in a central safety database and linkable to, or accessible by other safety database such as incident reporting systems and technical fault reporting system while safeguarding the confidentiality of the FDAP data.

5.4.2   This cross-reference capability enables a multi-dimensional and circumferential understanding of events providing accurate information on the overall safety health of flight and maintenance operations.

6.   IMPLEMENTATION

6.1   **Reference Documents**

To assist with the implementation of the Flight Data Analysis Program, operators should make reference to:

(i)   ICAO Doc 10000 *Flight Data Analysis Programme Manual (FDAPM)*
(ii)   ICAO Doc 9422 *Accident Prevention Programme*
(iii)   ICAO Annex 13 Attachment E *Legal Guidance for the Protection of Information from Safety Data Collection and Processing System*

6.2   **Pilot Support**

6.2.1   Pilot support and cooperation is essential for a successful implementation of the FDAP. The narrative provided by the pilots on exceedence detection provides an important part in the investigation and analysis loop. Raw data itself collated from the FDAP will not provide meaningful understanding of hazards and the associated risk.

6.2.2   De-identification of crew involved in exceedence events from management contributes to the development of trust for the FDAP. De-identification of gross exceedence data also forms the tool for the non-punitive aspect of the FDAP.

6.2.3   Formal agreement/ protocol between the management and pilots on the procedures and data protection for gross exceedence events should be reached prior to FDAP implementation. It should be stressed that such agreement only encompass gross exceedence data management and must not include data required by the operator for reportable incident investigation and continuing airworthiness aspect of the FDAP.

6.3   **FDAP Committee**

6.3.1   Administration of the FDAP should involve all stakeholders and the formation of a committee. Members of the FDAP Committee team should include the following:

(i)   Safety Department
(ii)   Pilot representative
(iii)   Data Analyst/ Technical Interpreter
(iv)   Flight Operations Fleet management
(v)   Flight Operations Training department
(vi)   Human Factor interpreter

6.3.2   The FDAP Committee is responsible for the formulation of the pilot re-engagement program in gross exceedence events. Such re-engagement programs should be documented and validated by the continuing FDAP trending.

6.4   **Just Culture**

6.4.1   The FDAP places emphasis on data de-identification as a mean to support the non-punitive nature of the program. In gross exceedence events, the FDAP provides learning lessons and trends are to be generated without the threat of censure to the event actors.

6.4.2   Operator should balance the benefits of a Just Culture within the overall Safety Culture in the organization against willful violations of Standard Operating Procedures detected by the FDAP. The emphasis on non-punitive aspect of the FDAP must not be all encompassing and be allowed to evolve into a No-Blame Culture which may erode disciplined adherence to safe operational procedures. In cases of gross exceedence events attributable to wilful violation resulting in unsafe and undesirable aircraft state, the operator must seek to identify the violator through the FDAP committee and prescribe a re-engagement program to prevent recurrence. In such cases, the FDAP committee should not withhold the identification of the event without compelling justification.