



ICAO

Doc 10000

Manual on Flight Data Analysis Programmes (FDAP)

Second Edition, 2021



Approved by and published under the authority of the Secretary General

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AMENDMENTS

Amendments are announced in the supplements to the *Publications Catalogue*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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FOREWORD

Guidance material on Flight Data Analysis (FDA) was initially contained in the first edition of the *Safety Management Manual (SMM)* (Doc 9859), Chapter 16, 16.3. This material was incorporated into the first edition of this manual in 2013 in order to highlight the importance of establishing an FDA programme (FDAP).

The content of the manual was based on the initial text in Doc 9859 and was updated with the following content changes:

- a) improved description of the relationship between the safety management system (SMS) and an FDAP; an FDAP is an effective tool for the safety assurance component of air operators;
- b) improved description of safety culture in relation to a non-punitive system, safety culture in general and duty-of-care;
- c) adoption of a systematic and comprehensive approach to describing an FDAP. In particular, FDAP processes are redrafted to be coherent and appropriately aligned with the safety risk management principles as contained in the SMM; and
- d) a more detailed description is provided of the composition of the FDA team and a description of the key objectives for an effective relationship between the FDA team and management rather than proposing a specific method.

Following the publication of the first edition in 2013, additional work was conducted to identify industry best practice and to further develop the actions required by States to enhance the implementation of FDAPs, leading to the development of the second edition. The material related to safety information protection has also been updated in line with changes on safety data and safety information protection included in Amendment 1 to Annex 19 — *Safety Management*.

Comments on this manual, particularly with respect to its application and usefulness, are appreciated. These comments will be taken into consideration in the preparation of subsequent editions. Comments concerning this manual should be addressed to:

The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
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PUBLICATIONS

ANNEXES

Annex 6 — Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes

Annex 6 — Operation of Aircraft, Part III — International Operations — Helicopters, (Section II, Commercial Air Transport only)

Annex 13 — Aircraft Accident and Incident Investigation

Annex 19 — Safety Management

MANUALS

Human Factors Guidelines for Aircraft Maintenance Manual (Doc 9824)

Human Factors Guidelines for Safety Audits Manual (Doc 9806)

Manual for the Oversight of Fatigue Management Approaches (Doc 9966)

Manual of Aircraft Accident and Incident Investigation (Doc 9756)

Part I — Organization and Planning

Part II — Procedures and Checklists

Part III — Investigation

Part IV — Reporting

Manual of All-Weather Operations (Doc 9365)

Safety Management Manual (SMM) (Doc 9859)

ACRONYMS AND ABBREVIATIONS

ADRS	Aircraft data recording system
ANSP	Air navigation services provider
ATC	Air traffic control
ATM	Air traffic management
EAADM	European Authorities Coordination Group on Flight Data Monitoring
EASA	European Union Aviation Safety Agency
FDA	Flight data analysis
FDAP	Flight data analysis programme
FDM	Flight data monitoring
FDR	Flight data recorder
FOQA	Flight operational quality assurance
LOSA	Line operations safety audit
MMO	Max operating Mach number
QAR	Quick access recorder
SARPs	Standards and Recommended Practices
SMM	Safety Management Manual
SMS	Safety management system
SOP	Standard operating procedure
SSP	State safety programme
TAWS	Terrain awareness and warning system
VFE	Max flap extended speed
VLE	Max landing gear extended speed
VLO	Max landing gear operation speed
VMO	Max operating speed
VNE	Never exceed speed

Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 Initially, the principal use of flight recorders was to assist accident investigators, especially in those accidents with no surviving flight crew members. As the tools to recover and analyse flight data became more affordable, it was recognized that analysis of the recorded data could be utilized to enhance the safety and efficiency of daily operations. By routinely analysing the recorded flight parameters, much could be learned about the safety of flight operations and the performance of airframes and engines. Additionally, analysis of this de-identified data can provide notice of emerging trends that allow proactive identification of safety hazards.

1.1.2 To capitalize on these benefits, a number of operators set up programmes to routinely analyse recorded flight data. The aviation industry is increasingly analysing recorded data from normal operations in support of organizations' safety management systems (SMSs). Flight data analysis (FDA) provides another tool for proactively identifying safety hazards, and controlling and mitigating the associated risks.

1.1.3 Recognizing the important safety value of such programmes, ICAO published Standards and Recommended Practices (SARPs) in Annex 6, Parts I and III, outlining the requirements for establishing and maintaining a flight data analysis programme (FDAP). Further details on FDAP provisions are contained in 1.5.

1.2 OBJECTIVES AND SCOPE

1.2.1 This manual is addressed to States providing oversight to air operators as well as to air operators performing commercial air transport operations with aeroplanes and helicopters.

1.2.2 The objective of this manual is to provide:

- a) a description of the relationship between SMS and FDAP;
- b) an overview of FDAP elements;
- c) guidance for the establishment and implementation of an FDAP; and
- d) guidance to States on promoting and assessing FDAPs.