

Flight Manuals — Why CAMOs need them

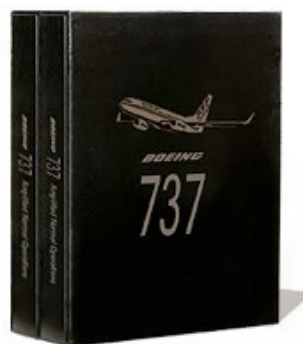
A Baines Simmons Thought
Leadership Document by

David Innes

FIRST PUBLISHED MAY 2011
REVISED JULY 2022



The easiest way to realise the full potential benefits is for every EDA participating Member State to adopt the EMARs in their purest form, bringing instant standardisation and harmonisation.



FLIGHT MANUALS – WHO NEEDS THEM?

David Innes, Principal Consultant and Subject Matter Leader – Continuing Airworthiness, discusses these much-neglected documents and why operators should perhaps give them the respect they deserve.ⁱ

BACKGROUND

Entering this industry in the early 80's, the author was fortunate enough to benefit from an undergraduate apprenticeship at a big airline, which gave him experience not only in line and base maintenance, but also technical services, planning, and maintenance control.

However, as valuable as this was (and he still very much draws upon his experiences of the time), it wasn't until he took up a new role in a smaller airline that he came across his first Aeroplane Flight Manual.

Experience since in a variety of roles and organisations, suggests that the big airline concerned is not alone in its apparent disinterest in these weighty tomes. Whilst in some cases these are presented in "as new" condition with pages barely touched by human hand and all the supplements intact (often still wrapped in the original cellophane), and in others, as dusty relics of a bygone time with pages damaged and/or missing altogether, it is clear that the intent of these vital documents may have been missed somewhat in some quarters.

FRESH EYES, BUT A CLOUDED VIEW?

The introduction of Airworthiness Reviews provided an opportunity for Operators and Continuing Airworthiness Management Organisations to review the Flight Manual and the role it should play in the safe operation of airworthy aircraft. However, it is apparent that this may often be without the benefit of knowing its design-related purpose or the regulatory background to its existence and use.

Each aircraft is given a Flight Manual at birth as it rolls from the production line and this is reviewed for applicability, completeness, and accuracy during the initial Airworthiness Review and recommendation to issue a C of A and Airworthiness Review Certificate (ARC). In many commercial operators, especially larger ones with fleets of aircraft rather than individual examples, these original documents are often "filed" with the rest of the delivery documentation, not to be seen again until the next Review in up to 3 years' time.

Operator-specific Operations Manuals have largely usurped the humble Flight Manual on the flight deck of most large or Complex Motor Powered Aircraft (CMPA) and whilst these documents must provide the same information as the Flight Manualⁱⁱⁱ, supplemented by operator-specific procedures, the linkage between the two documents is often lost somewhere between the Flight Operations Director and the Technical Director, or, for that matter, the Safety and Compliance Managers, in some organisations.

THE LINK TO DESIGN^{iv}

The Aircraft Flight Manual (AFM) provides information to safely operate the aeroplane under normal, abnormal, and emergency conditions. The AFM contains the operating limitations, operating procedures, and performance information for the aeroplane. This is a requirement placed upon aeroplane designers by the airworthiness code, e.g. Certification Specification (CS) 25 for large aeroplanes^v, and hence forms part of the type design that is considered and approved by the regulator during the type certification process; it defines the "box of minimum operating standards and limitations" that must be adhered to meet the declared design standard.

Historically, the AFM was often the only source of information available to the flight crew for safely operating a transport category aeroplane. Consequently, the form and



Consequently, the form and content of these earlier FMs were designed to meet the needs of the flight crew.



content of these earlier AFMs were designed to meet the needs of the flight crew. For example, very detailed operating procedures were presented in a form easily used in the cockpit (checklist format).

As more complex equipment was incorporated into transport category aeroplanes, many aeroplane and equipment manufacturers developed separate operating manuals intended for on-board use by the flight crew. These operating manuals are generically referred to within this paper as Flight Crew Operating Manuals (FCOM). By locating information such as cockpit checklists, systems descriptions, and detailed procedures in the FCOM, the bulk and complexity of the AFM can be kept manageable. As a result, the AFM for many transport aeroplanes has evolved into more of a reference document than a document used frequently by the flight crew. In recognition of the usefulness and convenience provided by these FCOMs, the normal operating procedures information in the AFMs for these transport category aeroplanes is now generally limited to those procedures considered 'peculiar' to the operation of that aeroplane type. As a result, the AFM is now generally limited to the smallest practicable amount of material that is appropriate for the intended operation of the aeroplane. In general, the systems descriptions and procedures provided in the AFM for most large transport aeroplanes is limited to that which is uniquely related to aeroplane safety or airworthiness.

OPERATING RULES

Extant regulations require the operator to carry the AFM on the aeroplane, unless the same information is reproduced in the required Operations Manuals. Broadly, the following conditions apply to the use of the Operations Manual in lieu of the AFM:

- The Operations Manual carried on board the aircraft shall include the information contained in the "Limitations" and "Emergency Procedures" sections of the FM.

- Performance instructions used for the operation of the aircraft shall be derived from approved material contained in the FM.
- The "Normal" and "Abnormal" procedures, or acceptable equivalents, shown in the FM shall be incorporated into the Operations Manual.
- The operator shall ensure that the Operations Manual is amended without delay to reflect any changes made to the "Limitations", "Emergency Procedures" or "Performance" sections of the FM.
- The AFM is to be kept in a place readily accessible for reference to engineering and operations staff, flight crew and CAA inspection staff.

Equally, the certification specification requires "the operating limitations and other information necessary for safe operation ... be made available to the crew..."; thus providing the vital connection between the airworthiness requirements and the operating rules.

CONTINUING AIRWORTHINESS MANAGEMENT IMPLICATIONS

The C of A only remains valid subject to "...compliance with the applicable type-design and continuing airworthiness requirements^{vii}...", it is therefore incumbent upon operators to ensure that AFM limitations, procedures, and other requirements are observed during all operations and that those responsible for the continuing airworthiness of the aircraft contribute to ensuring this is the case, in order to meet the continuing airworthiness requirements. The Flight Manual is only specifically referred to in the requirements relating to the Airworthiness Review, and this rather limited reference may contribute to the general misconception that it only needs to be considered at the time of the Review itself. However, the Flight Manual (and any documents used as its equivalent during operations, e.g. the Operations Manual)



The Flight Manual is only specifically referred to in the requirements relating to the Airworthiness Review, and this rather limited reference may contribute to the general misconception that it only needs to be considered at the time of the Review itself.



must be kept up to date on a continuing basis in relation to:

- revisions issued by the Type Certificate (TC) holder,
- changes mandated by the State of Design, the State of Registration, and/or the State of the Operator (e.g. Airworthiness Directives (ADs) affecting operations), and
- changes resulting from modifications applied to the aircraft by the operator.

Operators should therefore have processes in place that ensure that the above information is received, assessed, and implemented in a timely manner by appropriate personnel within the Operations and Continuing Airworthiness Management departments and that adequate records are maintained to allow this to be subsequently demonstrated to Airworthiness Review Staff, Quality Auditors (Compliance Monitors), and ultimately the regulatory authorities.

SUMMARY

The humble Flight Manual forms part of the type design of the aircraft and whilst it no longer has to be carried on board, whatever is carried on board in its place must reflect it, otherwise the aircraft's Certificate of Airworthiness will become invalid with the consequential loss of insurance cover amongst other risks.

Operators should ensure that there are clear lines of responsibility for keeping the AFM up to date and ensuring the Operations Manual remains in concert with it; both on a continuing basis. Management procedures should ensure, and Quality audits should verify, that any changes to the Operations Manual do not contradict any current AFM limitation or requirements and records are maintained to allow proper and effective Airworthiness Reviews. All of this assumes, of course, that the flight crew use the Operations Manual as intended – but that would be a whole different discussion

David Innes
Principal Consultant
Baines Simmons

- i This paper generally relates to the practices and requirements relating to large aeroplanes, but similar principles apply to rotorcraft
- ii M.A.901 of Annex I (Part-M) to Regulation (EC) 1321/2014
- iii ORO.MLR.100 of Regulation (EC) 965/2012
- iv Information extracted from AMC 25.1581
- v CS 25.1581
- vi
- vii 21A.181 of Annex I (Part-21) of Regulation (EC) 748/2012
- viii M.A.201 of Annex I (Part-M) of Regulation (EC) 1321/2014

About Baines Simmons

We are specialists in aviation regulations, compliance and safety management and partner with the world's leading civil and defence aviation organisations to improve safety performance. As trusted advisors to businesses, armed forces, governments and regulators across all sectors of aviation, we help to advance best practice, shape safety thinking and drive continuous improvement to safety performance through our consulting, training and outsourced services.