

# FLIGHT OPERATIONAL QUALITY ASSURANCE (FOQA)

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April 2025

# Introduction

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- The aviation community is under constant pressure to reduce accident and incident rates, while optimizing operational costs to remain competitive. **Flight Data Monitoring (FDM)**, also referred to as **Flight Operations Monitoring (FOM)** or **Flight Operations Quality Assurance (FOQA)**, offers an efficient solution to this challenge. This quality assurance process, which consists of downloading and analyzing aircraft data on a routine basis, is now being used by operators throughout the world to facilitate corrective actions in a range of operational areas.


# FOQA Program History

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- FAA Concept Development Study: 1995-1998
  - Provided U.S. airlines with guidance on how to establish effective FOQA programs
  - Documented successes and safety benefits of U.S. airline trial FOQA programs
- Flight Safety Foundation promotions (1998)
- AC 120-82 (2004)
  - Guidance on developing FOQA program


# What is FOQA?

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- Technology that collects and analyzes aircraft operational parameters
-  • Uses flight data recorders (FDR) or quick access recorders (QAR)
- Resulting data is stored and analyzed with software to identify program defined events

# What Does FOQA Measure ?

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- Routine downloading and systematic analysis of aircraft parameters that were recorded during flight
-  • Continuous comparison of flight profile, engine and systems operation with a set of defined parameters in order to detect exceedences.
- Compilation of data to obtain an accurate overall picture of the operation and the condition of engines and systems.
- Aids diagnostics, research and incident investigation.

# What Can FOQA Identify?

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- Non-compliance and divergence from SOPs
- Inadequate SOPs and inadequate published procedures
- Ineffective training, and inadequate skills
- Fuel inefficiencies and environmental un-friendliness
- Aerodynamic inefficiency / Powerplant deterioration
- System deficiencies

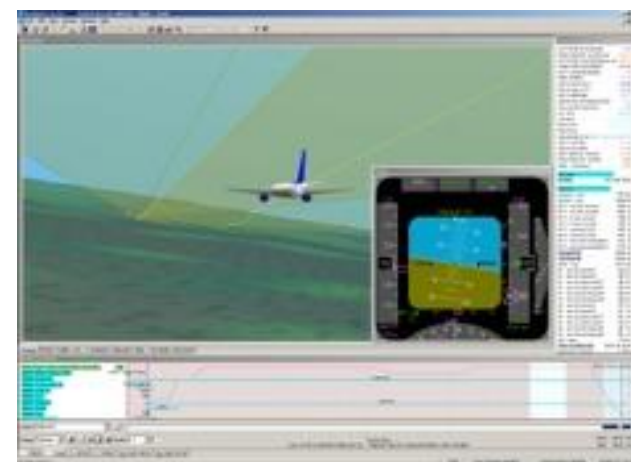
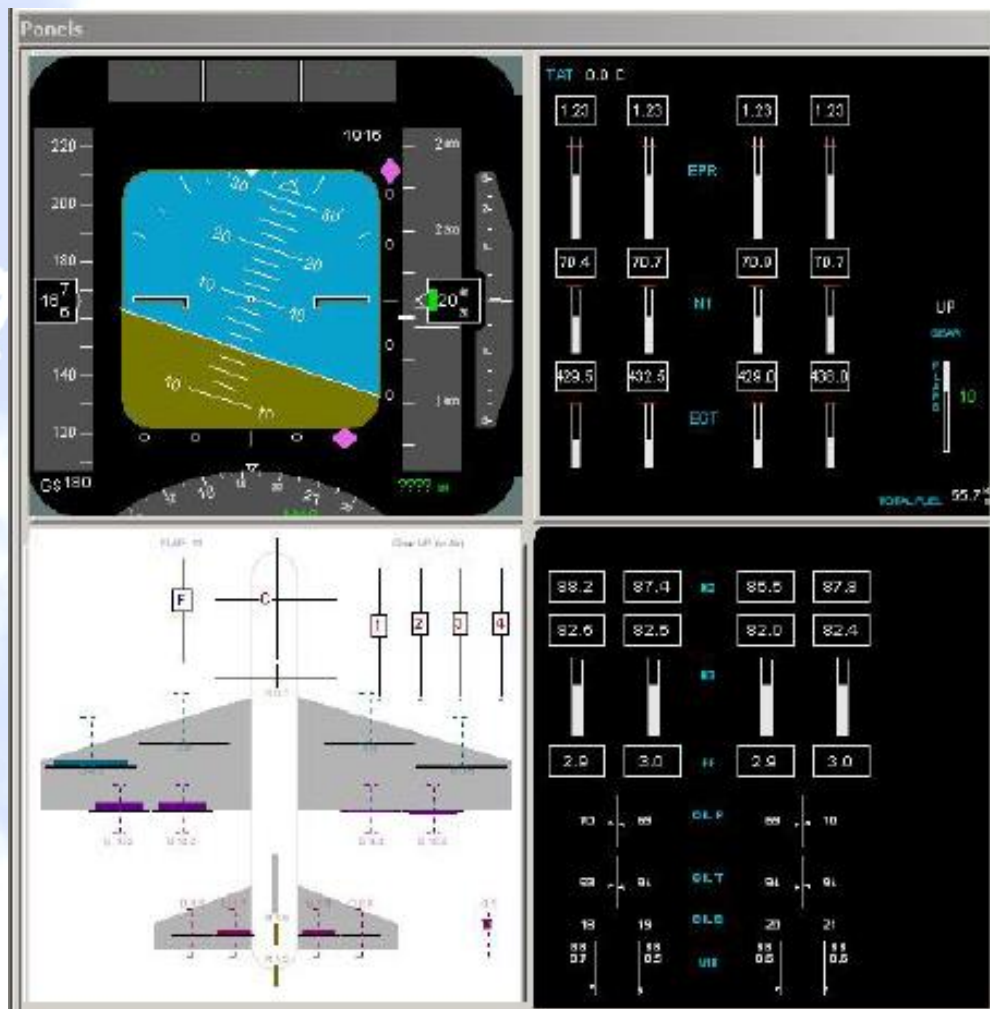
**The vast majority of information gained by FOQA cannot be found in any other way**

# FOQA Identified Event Examples

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- Altitude deviation
- Abnormal pitch landing
- Excessive pitch attitude
- Stick shaker
- Early flap change after takeoff
- Engine overtemp
- Etc.

# FOQA Output Examples



# FOQA Real World Accomplishments

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- Airline saved \$100 million by reducing takeoff engine overtemps from 46 to 6 (discovered autothrottle flaw)
-  • FAA realigned airspace at Orlando International because of FOQA recorded unstabilized approaches
- Airline saved \$1 million over the past year in inspections it didn't have to perform by using FOQA data to educate pilots on how to avoid flap over-speed conditions

# FOQA Concerns

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- Cost- installation and ongoing data processing
- Punitive action- to overcome must have a “just culture”
- Infrastructure support to process data
- False positives



# Additional FOQA and FDM Notes

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These notes are intended as guidance to the aircrew and management involved in the FOQA/FDM program and can be used to build a FOQA/FDM section in your manual.

## **Introduction:**

It is important to be aware that FOQA/FDM is but a part, albeit an important one, of [Operator]'s total use of Flight Recorder Data. These notes refer specifically to the FOQA/FDM program.

It has long been understood that the greatest safety benefit will be derived from FOQA/FDM by working in a spirit of mutual co-operation towards improving flight safely. A rigid set of rules can, on occasions, be obstructive, limiting or counter-productive and it is preferred that those involved in FOQA/FDM should be free to explore new avenues, by mutual consent, always bearing in mind that FOQA/FDM is a safety program and not a disciplinary tool. The absence of rigid rules means that the continued success of FOQA/FDM depends on mutual trust.

## **Purpose:**

The primary purpose of the FOQA/FDM program is to enhance flight safety. The actions to be taken to reverse an adverse trend or to prevent the repetition of an event may include raising pilot awareness, changing procedures or manuals or seeking to change pilot behavior, individually or collectively, amongst others.

# Additional FOQA and FDM Notes

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Interested third parties (Airbus, IAA, JAA/EASA, and FAA, MITRE or a research body) may seek FOQA/FDM data for safety purposes.

If the request is for de-identified data (i.e. the data does not contain any information that would enable the data to be identified as originating from a particular flight) then [Operator] may supply this information.

If, on the other hand, the requested data only has value when it can be linked to specific flights then [Operator] must obtain the consent of the individuals concerned before proceeding with disclosure.

## **Procedures:**

Quick Access Recorder (QAR) media will be removed from the aircraft on a regular basis and the data will be transmitted to a contracted agency that will analyze the information therein and compare it to a set of parameters supplied by [Operator].

In the event that a pre-determined limit is exceeded e.g. rate of descent below 1,000 feet, in excess of 1,200 feet per minute for four seconds, an "exceedance" (Limit 3) message will be e-mailed to the FOQA/FDM Manager. Lower values than this, Limits 1 and 2, will be recorded for statistical purposes and reported to [Operator] at regular intervals.

The FOQA/FDM Manager will exercise his/her judgment in deciding the most appropriate method of investigating any exceedances.

# Additional FOQA and FDM Notes

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## **Confidentiality:**

It is fundamental to the purpose of the scheme that, where necessary, the substance of the reports should be disseminated in the interests of flight safety. However, without prejudice to [Operator], proper discharge of responsibilities as required by law, the FOQA/FDM Manager will be the only person who will be aware of the pilot's identity.

## **Exceptions:**

- If the event is subject to an [Operator] Incident Report the QAR data may be used to obtain greater detail or understanding.
- Should the same pilot be involved in repeated events, following due notification to him/her, the FOQA/FDM Manager may inform his/her Chief Pilot with a view to recommending extra training.
- In other cases of repeated events by the same pilot, a single pilot- induced event of such severity that the aircraft was seriously hazarded or another flight would be if the pilot repeated the event, the FOQA/FDM Manager may report the matter to the Chief Pilot.

# Additional FOQA and FDM Notes

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- If Airborne Collision and Avoidance System resolution takes place during your flight you must notify the Director of Operations or the Chief Pilot so that the NTSB can be notified without delay. You shall then notify the Director of Safety with an email or phone call with the flight details so he/she can record the incident in the FOQA report.

**Note:** In reference to *NTSB 830.5 Immediate Notification*

*(10) Airborne Collision and Avoidance System resolutions issued either:*

- (i) When an aircraft is being operated on an instrument flight rules flight plan and compliance with the advisory is necessary to avert a substantial risk of collision between two or more aircraft; or*
- (ii) To an aircraft operating in class A airspace*

# Additional FOQA and FDM Notes

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## **Confidential Contact with Pilots:**


It is recognized that the QAR trace may give an incomplete picture of what happened, and that it may not be able to explain why it happened. The FOQA/FDM Manager may contact the pilot(s) involved to elicit further information regarding a particular event. Further, the FOQA/FDM Manager may remind pilots of [Operator]'s SOPS where these appear to have been disregarded.

Contact will initially be with the Captain of the flight; however, where Human Factors are thought to be involved, it may also be necessary to contact the First Officer.

If a pilot fails to co-operate with the FOQA/FDM Manager, the FOQA/FDM Manager may pass the responsibility for contact with that pilot, and any subsequent action, to [Operator]'s Chief Pilot.

# Information on FOQA Implementation

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- FAA guidance: AC 120-82 for airlines
  - C-FOQA: Corporate FOQA data sharing program by the Flight Safety Foundation
  - ICAO: (Annex 6 Part 1)
    - 3.3.2** 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 safety management system.
    - Note.— An operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.*
    - 3.3.3** A flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.
  - Paragraph ORO.AOC.130 of Commission Regulation (EU) No 965/2012, Annex III
    - The operator shall establish and maintain a flight data monitoring system, which shall be integrated in its management system, for aeroplanes with a maximum certificated take-off mass of more than 27 000 kgs
    - The flight data monitoring system shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

# Reference Material

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- [AC 120-82 - Flight Operational Quality Assurance](#)
- [Microsoft Word - Anx.06.Part.01.11th Ed.incl.Amdt.44.alltext.en.INPROGRESS.CC.docx](#)
- [Commission Regulation \(EU\) No 965/2012 - Air Operations | EASA](#)
- [213398\\_EAFDM\\_GoodPractice\\_FDMOversight.indd](#)

