Flight Data Recorders and International Operations

Introduction
The international aviation community has placed significant emphasis in recent years upon Flight Data Recorders (FDRs), as aircraft accident investigation arms of governments (e.g., the United States' National Transportation Safety Board, among others) have pushed for the installation of more advanced FDRs in newer aircraft to support more definitive accident investigation capabilities. As new FDR standards and regulations come into existence, business aircraft operators periodically wrestle with questions concerning FDRs and international operations. When reviewing the regulations of specific countries or even International Civil Aviation Organization (ICAO) standards, operators sometimes wonder whether they are required to equip their aircraft with a particular type of FDR in order to operate as a transient aircraft in a given country.

Regulatory Situation
While aviation regulations and standards can at times be challenging to interpret, the National Airworthiness Authorities (NAAs) of individual countries typically do not levy or enforce FDR equipment requirements upon transient aircraft that are not registered or do not principally operate within their jurisdictions. This practice is in keeping with ICAO standards and procedures. Although individual National Airworthiness Authorities (NAAs) may well levy equipment requirements that address safety of flight or airspace capacity issues upon all aircraft operating in their airspace regions, FDRs do not fall within this category. Unlike operational examples such as RVSM, Enhanced Surveillance transponders, TCAS II, ADS-B Out, and the like, FDRs contribute nothing to the safety of aircraft operation in real time or to improvement in airspace capacity. FDRs fall within the category of equipment required to support accident investigations, which typically come under the purview of the appropriate agency within an aircraft operator’s own country of registration. It is also worth noting that FDR equipment type or status is not included in the ICAO international flight plan format.

International Civil Aviation Organization (ICAO) Standards and Procedures
It is important to understand that ICAO is not a regulatory body. ICAO’s stated purpose is to develop international Standards and Recommended Practices (SARPs), which individual ICAO member countries then reference when developing their own legally enforceable national civil aviation regulations. When ICAO creates a new standard or amends an existing one, it then becomes the responsibility of each member country to adopt the new or amended standard within its own body of national regulations. The NAA of an ICAO member country retains the right to not adopt a particular standard, or to adopt an altered version, but in such a circumstance, the NAA is required to file a “notification of difference” with ICAO to note the departure from the ICAO standard, in accordance with Article 38 of the Convention on International Civil Aviation (“Chicago Convention”). For this reason, operators need to know the national regulations of the countries in which they register and operate their aircraft. While familiarity with ICAO standards may be helpful in understanding the background behind national aviation regulations or for understanding the types of requirements that one is likely to encounter around the world, the ICAO standards themselves do not represent a universal body of regulations for international operators to follow.

ICAO SARPs concerning aircraft equipment requirements (including FDR installations) are contained within ICAO Annex 6 Part I Chapter 6 (for commercially operated aircraft) and Part II Chapter 2.4 (for privately operated aircraft). Each of these chapters states the following in its general introductory paragraph (6.1 and 2.4.1, respectively):

In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in aeroplanes according to the aeroplane used and to the circumstances under which
the flight is to be conducted. The prescribed instruments and equipment, including their installation, **shall be approved or accepted by the State of Registry.** [emphasis added]

The above paragraph makes it clear that the NAA of each ICAO member country bears the responsibility to determine the details of and approve equipment installations. (This includes FDR installations.)

ICAO Document 7030 (Regional Supplementary Procedures) addresses specific operational needs in specific regions of the world. Similar to (though distinct from) the SARPs, such supplementary procedures are reviewed and approved by the ICAO Council and promulgated among the contracting countries in the relevant regions for incorporation into NAA regulations, as appropriate. It is significant to note that nowhere in ICAO Document 7030 is FDR equipment mentioned. This is thoroughly logical, since an FDR equipment installation is not a regionally driven operational need, whereas other kinds of equipment installations mentioned in Document 7030 definitely are:

Example:

5.3.1.1 ACAS II shall be carried and operated in the EUR Region (and the Canarias FIR) by all **turbine-engined aeroplanes** having a maximum certificated take-off mass exceeding 5 700 kg or authorized to carry more than 19 passengers. [emphasis added]

Such supplementary procedures distinguish themselves from SARPs in that they are intended for applicability (likewise via adopted NAA regulations) to all targeted aircraft within the affected regions and not just to those registered within the affected countries within those regions.

**Examples of National Regulations**
The following comparisons present examples of national regulations that apply only to aircraft registered or principally operated within a given country versus regulations that apply to all aircraft, including transients. These excerpts are given as examples only. Aircraft operators should consult current regulations directly to determine requirements for their operations. Note the key differences between the two kinds of regulations (bold font added for emphasis):

**United States - Example 1: FDR Requirement Applicable to US-Registered Aircraft**

14 CFR 91.609(c)(1) –  
No person may operate a **U.S. civil registered**, multiengine, turbine-powered airplane or rotorcraft having a passenger seating configuration, excluding any pilot seats of 10 or more that has been manufactured after October 11, 1991, unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium, that are capable of recording the data specified in appendix E to this part....

**United States - Example 2: TCAS II Minimum Software Level Requirement Applicable to All Aircraft Operating in US RVSM Airspace with a TCAS II System**

14 CFR 91 Appendix G, Section 2(g) –  
Traffic Alert and Collision Avoidance System (TCAS) Compatibility With RVSM Operations: **All aircraft.** After March 31, 2002, unless otherwise authorized by the Administrator, if you operate an aircraft that is equipped with TCAS II in RVSM airspace, it must be a TCAS II that meets TSO C-119b (Version 7.0), or a later version.
Australia – Example 1: FDR Requirement Applicable to Australia-Registered Aircraft

Civil Aviation Order 20.18: Aircraft Equipment – basic operational requirements

1 Application

This section applies to all Australian registered aircraft

6 Recording equipment

An aircraft of maximum take-off weight

(a) In excess of 5 700 kg and which is:
   (i) Turbine powered; or
   (ii) Of a type first certificated in its country of manufacture on or after 1 July 1965;

Shall not be flown (except in agricultural operations) unless it is equipped with an approved flight data recorder and an approved cockpit voice recorder system...

Australia – Example 2: ADS-B Out Requirement for All Aircraft

Civil Aviation Order 20.18: Aircraft Equipment – basic operational requirements

9B Directions relating to carriage and use of automatic dependent surveillance – broadcast equipment

9B.1 This subsection applies to aircraft engaged in private, aerial work, charter or regular public transport operations in Australian territory

9B.8 On and after 12 December 2013, any aircraft that is operated at or above FL 290 must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.

India - Example 1: Flight Data Recorder Required for Aircraft Registered in or Imported, Purchased, or Leased for Operation in India

Civil Aviation Requirements, Section 2 – Airworthiness, Series 'I', Part V, Issue II, 23rd Jan 2013, Rev 2, 14th November 2014

1. PURPOSE

...This part of the Civil Aviation Requirement[s] lays down the requirements for fitment of Flight DataRecorders, Combination Recorders, Data Link Recorders, Airborne Image Recorders, Airborne Image Recording System[s] and Aircraft Data Recording System[s] on aircraft registered in India. All aircraft imported/purchased or leased for operation in India shall meet the applicability requirements laid down in this CAR.

4.2.2.3

All aeroplanes of a maximum certificated takeoff mass of over 5700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2005 shall be equipped with a Type IA FDR.
India - Example 2: ACAS [TCAS] II “Recommended” for All Aircraft Operating in Indian Airspace


2. Applicability

The requirements of this CAR are applicable to aeroplanes referred to in paras 5 and 6 and engaged in commercial and general aviation operations to, through, within and overflying the Indian airspace.

6.2

It is recommended that all turbine-engined aeroplanes of a maximum certificated take off mass in excess of 5700 kg but not exceeding 15000 kg, or authorized to carry more than 19 passengers, for which the individual airworthiness certificate is first issued after 01 January 2008, should be equipped with an airborne collision avoidance system (ACAS II).

Frequently Asked Questions

1. Is an operator required to comply with ICAO “regulations” when operating internationally?

ICAO itself is not a regulatory body and does not produce regulations; it produces standards for NAAs to incorporate into their own regulations. See the section on page 1 entitled, “International Civil Aviation Organization (ICAO) Standards and Procedures.”

2. Could a particular country conceivably levy a requirement even on transient aircraft for an FDR?

The NAAs of individual countries have the authority to implement whatever requirements they choose. However, intentionally levying specific FDR requirements upon operators of transient aircraft would represent a significant departure from the proper application of ICAO standards and procedures and would create a burden of impractical proportions upon such operators, who are responsible to adhere to the FDR installation requirements of their own respective NAAs. Depending upon complexity, FDRs can cost $100,000 to $200,000 (or more) to install, and having to install or modify FDRs in order to conduct temporary operations in a given region would be cost-prohibitive. Textron Aviation is not aware of any country that intentionally levies FDR requirements upon transient business aircraft. While some NAAs may (through ignorance of the proper application and intent of ICAO standards and procedures) inadvertently create what appears to be an FDR requirement applicable to all aircraft including transients, ultimate enforcement of such FDR rules upon transient aircraft is impractical and unlikely.

3. Does Textron Aviation seek to advise customers regarding required equipment for their operations?

Cessna, Beechcraft, and Hawker continually strive to keep abreast of national airworthiness requirements worldwide, both from a certification as well as an operational point of view. This can be challenging at times, as some NAAs do not always make their intentions widely known in a proactive manner, while others at times levy requirements that are impractical and not in alignment with ICAO standards and must later be altered or rescinded. While Textron Aviation may not always have the last word on each and every current or pending operational requirement in every country, our Airworthiness and Customer Service teams are typically well aware of important operational considerations. Our company also operates fleets of demo aircraft worldwide, so we are well-versed in international operational equipment considerations.

Aircraft operators may be able to obtain useful guidance from their own NAA as well as from the NAAs of the countries where they intend to operate regarding equipment requirements. In addition, professional international flight planning services and handlers, such as Universal Weather and Aviation, Avplan, etc., may...
also be of assistance. In the final analysis, it is always ultimately the aircraft operator’s responsibility to ensure adherence to all applicable regulations for regions of intended operation.

Feel free to contact your Cessna, Beechcraft, or Hawker Customer Service representative if you have further questions.