

Airworthiness Now

A current guide to certification sees progress in the integration of European standards under one safety organization.



BOOKS

Airworthiness: An Introduction to Aircraft Certification

De Florio, Filippo. Oxford, England, and Burlington, Massachusetts, U.S.: Butterworth-Heinemann, 2006. First edition. 261 pp. Figures, bibliography, index.

“To allow an aircraft to be operational in normal air traffic, it is necessary to demonstrate that its design and construction are in compliance with the applicable requirements; the verification of such compliance is entrusted to the competent authorities,” says De Florio. “*Airworthiness* introduces aerospace engineering students and engineers into this world consisting, on the one hand, of designers, manufacturers and operators, and, on the other, of airworthiness authorities, in two disciplines that should work in unison, because they should aim at a common goal: flight safety.”

The book discusses certification regulations, the agencies that write them and the agencies that verify that they are followed from aircraft design to construction. Chapters cover the International Civil Aviation Organization and national and regional civil aviation authorities such as the Joint Aviation Authorities (JAA), the European Aviation Safety Agency (EASA) and the U.S. Federal Aviation Administration; airworthiness requirements; type certification; products, parts and appliances; airworthiness certification; and continued airworthiness in flight operations.

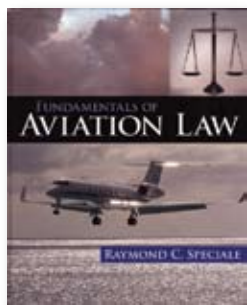
De Florio believes that the creation of EASA and its gradual assumption of the regulatory

role is a step forward. He says, “In spite of a huge amount of work accomplished for unification of regulations and procedures in Europe, the JAA did not have the authority to impose these rules. The EASA now has this power and can perform as a single authority. For instance, once an aircraft is type certificated by the EASA, this type certificate is valid for all the Member States, without being just a ‘recommendation’ for the issue of a national type certificate. Today, we have a single European agency instead of 25 national authorities, and a single certificate for aeronautical products.”

Fundamentals of Aviation Law

Speciale, Raymond C. New York: McGraw-Hill. 360 pp. Figures, appendixes, bibliography, index.

“It is important for all aviation professionals, including pilots, executives, air traffic controllers and mechanics, to have a fundamental understanding of the legal environment in which they operate,” Speciale says. He notes, however, that there is no universal recognition of “aviation law” as a distinct branch of legal systems, and subjects that apply to aviation can fall under traditional headings such as commercial law, tort law, employment law and property law. Non-U.S. readers should note that the book is mainly based on U.S. law, although the final chapter takes up international aviation law with sections on international agreements such as the Chicago Convention, Warsaw Convention and bilateral treaties.



Chapters are devoted to tort (injury) liability and air commerce, administrative agencies such as the U.S. Federal Aviation Administration, commercial law's applicability to aviation transactions, corporate and property law for aviation enterprises and employment law for the aviation industry.

Ways in which criminal law can affect pilots and air carriers are discussed in chapter 3. Offenses can include document falsification, transporting hazardous materials without authorization, operating an unregistered aircraft, and unauthorized fuel tank modifications.

"Whether a regulatory violation crosses the line into the realm of criminal violations is a difficult question to answer at times," Speciale says. He cites the U.S. federal government indictment of SabreTech, the operator of a repair station that packed partially expended oxygen generators as cargo aboard ValuJet Flight 592 in May 1996. The airliner crashed in the Florida Everglades, killing all 110 people aboard, after the eruption of a fire that later was attributed to the oxygen generators on the airplane.

An appeals court overturned a conviction against SabreTech and several of its employees on the grounds that "these aviation repair station personnel committed mistakes, but they did not commit crimes."

REPORTS

Manual for Preventing Runway Incursions

International Civil Aviation Organization (ICAO). Document 9870. First edition. 2006. 86 pp. Figures, references, appendixes. Available via the Internet at <www.icao.int/FSIX/Library1.cfm> or from ICAO.*

In 2001, the ICAO Air Navigation Commission identified areas that needed to be addressed for progress in runway incursion prevention. They included radio communications phraseology, language proficiency, equipment, airport lighting and markings, airport charts, operational aspects, situational awareness and human factors.

ICAO embarked on an education and awareness campaign, beginning with a comprehensive search of the best available educational material for an interactive runway safety tool kit, included in this manual as an appendix. The

organization held runway safety seminars in its various regions, culminating in the runway incursion prevention guidelines on which this manual is based.

"An evolution in terms of safety thinking has led to a change of focus, from individuals to organizations," the manual says. "It is now acknowledged that senior management decisions are influential in shaping the operational contexts within which operational personnel perform their duties and discharge their responsibilities. It is also well known that, no matter the extent to which operational personnel may excel in their performance, they can never ultimately outperform, safety-wise, systemic deficiencies and flaws in the system that [includes] them."

Chapters discuss contributory factors in runway incursions; establishing a runway incursion prevention program; recommendations for prevention of runway incursions — for aircraft operators, pilots, air traffic services providers and controllers, and regulators; incident reporting and data collection; and severity classification of runway incursions.

Systems can and should be improved, the manual says, but ultimately "properly selected, trained and motivated personnel" are the last line of defense against breakdowns of the system that are rare but inevitable. "Operational personnel are the true goalkeepers of the aviation safety system," says the manual.

Main Report for the 2005/2012 Integrated Risk Picture for Air Traffic Management in Europe

Spouge, John; Perrin, Eric. European Organisation for the Safety of Air Navigation (Eurocontrol), Eurocontrol Experimental Centre. EEC Note no. 05/06. April 2006. 98 pp. Figures, tables, references. Available on the Internet at <www.eurocontrol.int/eec/public/subsite_homepage/homepage.html> or from Eurocontrol.**

Eurocontrol has developed an integrated risk picture (IRP) for air traffic management (ATM) in Europe to describe the safety priorities in the gate-to-gate ATM cycle and the safety implications of future ATM developments. This report includes a baseline IRP for 2005 and a benchmark for 2012.

Among the questions the report asks, and tries to answer, are:

- What is the safety assessment of the overall system?
- How might new elements (e.g., conflict detection and resolution systems) interact?
- Can negative interactions be avoided, and as-yet unplanned positive interactions be introduced into the system design concept?
- What are the strong and weak safety areas in the overall system?
- Is the resultant system risk-sensitive to the sequence and timing of implication?

The report concludes that the IRP methodology, although needing further development, “provides the best currently available picture of the ATM contribution to aviation accident risks, and appears suitable for the wide range of intended uses and recommendation of safety improvements.”

Gate to Gate Safety: Solving Interface Problems in the Aviation System. Results of Working Group B, Flight Operations & Flight Crew Training

Roelen, A.L.C.; Smit, H.H.; Risseeuw, L.W.; van Bossuyt, B.C. National Aerospace Laboratory (NLR)—Netherlands. NLR-CR-2006-342. August 2006. 26 pp. Figures, tables, references, appendix. Available from NLR.***

“The ability to communicate and cooperate between different disciplines of the aviation system is vital for the system’s safety performance,” the report says. “In the current aviation system, interfaces [defined as a boundary across which two systems communicate] are not properly managed, and these interface problems downgrade flight safety.”

To demonstrate that solutions to interface problems can be developed, two working groups were created, both including operational specialists from various disciplines. This report describes a working group committed to solving interface problems between flight operations and flight crew training. The task of the working group was to provide detailed problem descriptions, develop original solutions and design their practical implementation — a methodology called Gate to Gate Safety.

“The group had a total of four meetings,” the report says. “In the first session, a description of the flight crew training process was discussed and agreed upon. A brainstorm was held in the second session to identify flows of information and to describe existing interface problems. In the third session, solutions to the identified interface problems were generated. These solutions were further specified in the final session.”

The report concludes that the Gate to Gate Safety methodology works: “Within a limited amount of time and resources, this working group came up with useful results.”



WEB SITES

International Civil Aviation Organization (ICAO), <www.icao.int/>

The International Civil Aviation Organization (ICAO), a United Nations Specialized Agency, works with member states to achieve safety, security and sustainable development of civil aviation. Through its Web site, ICAO gives members and nonmembers access to important safety information.

ICAO has posted selected guidance materials online at no cost. These free documents may be viewed, printed or downloaded to the user’s computer. Not all are available in all official ICAO member languages. Free material appears in numerous locations throughout the Web site, and the find is worth the hunt. Following are examples of these materials and their locations:



- The publications section lists a number of free items. Examples are *Systems Management Manual* (290 pages); preliminary, unedited chapters from the *Manual of Civil Aviation Medicine*; and *MRTD Report*, the new ICAO journal devoted to machine-readable travel documents.
- The signature publication, *ICAO Journal*, is available in full text and color for years 1991–2005. Viewing these issues requires DjVu Viewer, a Windows program that can be downloaded at no cost using the posted Web link.
- The aviation safety section of ICAO’s home page links to the Flight Safety Information Exchange, which has its own online library. Some full-text documents and manuals are *ICAO Manual of Preventing Runway Incursions*, May 2006, and *Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation* by the U.S. National Aeronautics and Space Administration, May 1996.

Hard-copy and electronic versions of documents and manuals are available for purchase through eCommerce, ICAO’s online catalog of publications.

Aircraft Owners and Pilots Association (AOPA), Air Safety Foundation (ASF), <www.aopa.org/asf/>

ASF promotes safety and pilot proficiency through training, seminars and courses, research and analysis, safety education programs, and publications primarily for general aviation pilots. Much of ASF’s information is free online.

One free safety online course of interest to airline operators is *Runway Safety*, available in versions for airlines and general aviation. It was “designed to help pilots avoid and prevent runway incursions by studying the various factors involved,” says the course introduction. The complex, interactive course uses combinations of graphics, sound and animation to teach and test pilots.



The opening page of the training program describes system and Internet requirements, estimated downloading times and estimated time to complete the program. Participants can comment on the programs through e-mail links to AOPA or Air Line Pilots Association, International (ALPA).

ALPA and FAA Office of Runway Safety and Operational Services provide alternative access to this runway safety program through their respective Web sites.

REGULATORY MATERIALS

Approval of Flight Guidance Systems

U.S. Federal Aviation Administration (FAA) Advisory Circular 25.1329-1B. July 17, 2006. 146 pp. Tables, appendixes. Available from FAA via the Internet at <www.airweb.faa.gov>. ●

Sources

- * International Civil Aviation Organization
Document Sales Unit
999 University Street
Montreal, Quebec H3C 5H7 Canada
- ** Eurocontrol
96, Rue de la Fusée
B-1130 Brussels Belgium
- *** National Aerospace Laboratory (NLR)
Anthony Fokkerweg 2
P.O. Box 90502
1006 BM Amsterdam The Netherlands

Books, reports and regulatory materials in InfoScan are available to FSF members on site in the Jerry Lederer Aviation Safety Library <www.flightsafety.org/library.html>.

— Rick Darby and Patricia Setze