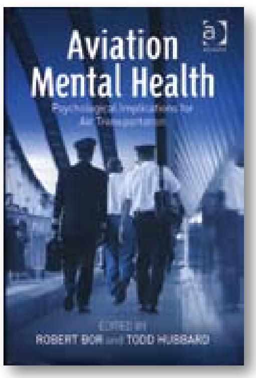
Mind in Flight

The nature of aviation creates its own psychological challenges that call for specialized monitoring and help.



BOOKS

Aviation Mental Health: Psychological Implications for Air Transportation

Bor, Robert; Hubbard, Todd (editors). Aldershot, England, and Burlington, Vermont, U.S.: Ashgate, 2006. 375 pp. Figures, tables, references, index.

Aviation professionals tend to distrust psychological evaluation and mental health therapy. Those processes involve subjectivity and ambiguity, which are not valued in the realm of aviation, where clarity and precision are standard procedure. It also appears to many who work in aviation that mental health issues arise only as a sign of something wrong, which can endanger a career.

Nevertheless, the human organism was not designed by evolution to fly — to be in a totally artificial environment disconnected from the earth for hours, sometimes in abnormal spatial attitudes, experiencing daytime and a demand for alertness when body and mind insist it's night and time to sleep — and some psychological difficulties are to be expected as a result.

No matter how well trained and experienced crewmembers are, they cannot be completely immune to stressors that aviation presents. Some, like jet lag, are mainly physiological. Others are psychological or emotional: the need to make decisions with potentially catastrophic consequences if they are wrong, the requirement for concentration and perception, and having to depend on and trust other professionals who may not be personally known to the individual. When operating as part of a crew, a pilot's actions are constantly monitored by other crewmembers, a situation that the editors describe as feeling like an endless driving test. Being repeatedly away from home for days at a time, possibly in a foreign environment, creates further pressures.

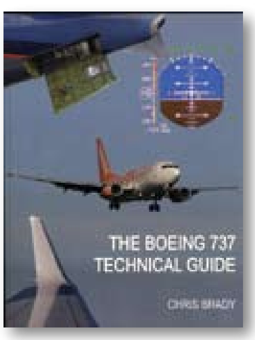
The editors hope their book will make the case that aviation mental health practitioners are there to help with the issues that flight introduces, not to find fault.

"This book seeks to present a modern, informed, balanced and useful application of mental health issues in aviation and to challenge outdated and negative impressions held by some about what mental health insights can offer to aviation," the editors say. "It is about the mental health of the millions of professionals worldwide responsible for flight. It is not, however, a book about aviation human factors."

Aviation mental health is concerned with six main tasks, the editors say: identifying those who are psychologically unfit for the work; monitoring the psychological health of those in training and employment in the aviation industry; assessing and treating those who develop psychological problems at work; determining whether and for how long an individual is unfit for aviation duty; emotionally supporting those considered unfit for duty, whether temporarily or long term; and preventing mental health problems through intervention, health promotion and research.

The papers comprising the book are organized under three headings: "Psychological Issues of Flight and Cabin Crew"; "Psychological Processes Among Passengers and Crew"; and "Related Themes in Aviation." Among the topics of papers are psychiatric disorders and syndromes among pilots; psychiatric evaluation of crewmembers; psychological factors in flight crew selection; and psychological problems among cabin crew. The several chapters about psychological problems of passengers in connection with flight might at first seem off-topic, but fear of flying and on-board psychiatric emergencies affect cabin crewmembers.

"The field of aviation mental health should not be seen to be limited to the diagnosis and treatment of psychopathology and psychiatric problems," the editors say. "A book of this scope is also concerned with the prevention of psychological problems, especially among crew." They acknowledge that some important groups are left out of the discussion, particularly air traffic controllers and maintenance technicians. The reason, they say, is a lack of scientifically sound published literature on those populations.



The Boeing 737 Technical Guide

Brady, Chris. United Kingdom: Tech Pilot Services, 2006. Version 15. 366 pp. Figures, diagrams, photographs, index.

An old engineering joke says, "When all else fails, read the manual." This guide is designed for Boeing 737 pilots who have read the flight operations manual and want to know more. The author, easyJet's maintenance test pilot, started and maintains The Boeing 737 Technical Website at <www.b737.org.uk>.

Brady says that the book is "intended to fill in the gaps left by existing publications. It contains facts, tips, photographs and points of interest, rather than simply being a reproduction of the manuals. Its broad scope will hopefully make it as interesting to students doing their type rating as it will be to training captains fielding unusual and searching questions from colleagues."

The book opens with a look at the history and development of the 737, from the 737-100 to the latest "next generation" and specialized models. Following a section about production, including materials, the book examines the systems that enable the airplane to do its job. Variations in systems among versions of the airplane and upgrades to systems are discussed.

Numerous photographs, all black-and-white except the front and back covers, illustrate the points covered by the text. Descriptions, while technical, sometimes have a personal touch: "On a couple of occasions, I have seen three reds and three greens [gear position indicator lights] after the gear has been selected 'DOWN.' This was because the telescopic gear handle had not fully compressed back toward the panel. If this happens to you, give it a tap back in and the red lights should extinguish."

A section titled "Pilots' Notes" gives background information on topics such as Boeing's new "Normal" checklists, crosswind takeoff and landing guidelines, landing techniques, procedures for loss of thrust from both engines, and sample type rating examination questions. The notes are to aid understanding and do not supersede company operational policies.

Every 737 hull-loss accident is described, and many descriptions include the investigative authority's determination of causal factors.

REPORTS

Assessing Institutional Resilience: A Useful Guide for Airline Safety Managers?

Wood, Margot; Dannatt, Robert; Marshall, Verena. Australian Transport Safety Bureau (ATSB). B2004/0240. Final report. June 2006. 63 pp. References, appendix. Available via the Internet at <www.atsb.gov.au/publications/2006/AVISE_20040240.aspx> or from ATSB.*

"History shows that some organizations operating in hazardous environments or using hazardous processes appear to 'forget' to be afraid of the hazards they face," the report says.

The term "institutional resilience" often is used to describe an organization's ability to "bounce back" from unexpected problems or to resist hazards. James Reason, a professor of psychology at Manchester (England) University who specializes in the organizational dimension of human error, has developed a checklist for assessing institutional resilience, including a version for the airline industry. This report presents the findings of a qualitative study investigating factors perceived to facilitate institutional resilience in airlines, obtained through interview questions adapted from Reason's checklist. Senior managers at 12 airlines operating in the Asian and Pacific regions were interviewed.

"If management is committed to facilitating institutional resilience, what does this *look like*?" the report asks. "The term 'committed' is included in Reason's checklist, and while overlapping with some terms, appears to be the 'driving force' behind others [identified in the study]."

The study found that strategies prevailing at resilient airlines included these:

- The chief executive and senior managers attend safety meetings and crew resource management seminars, and make themselves available for discussions with crewmembers.
- A safety department is backed by adequate resources, independent of flight operations and accountable to senior management.
- Recommendations for safety initiatives are endorsed and financially supported by top management and the governing board.
- Safety-related data are discussed openly and acted on without negative reference to individuals or groups.
- The safety department manager and personnel interact regularly and directly with crewmembers.

Reason's checklist for assessing institutional resilience in an aviation environment is included in an appendix. It includes 20 company characteristics that can be scored as "yes," "unsure" or "no," with numerical equivalents of 1, 0.5 and 0, respectively.

Total scores are interpreted as follows: "16–20 — So healthy as to be barely credible. 11–15 — You're in good shape, but don't forget to be uneasy. 6–10 — Not at all bad, but there is still a long way to go. 1–5 — The organization is very vulnerable. 0 — Jurassic Park."

New Refractive Surgery Procedures and Their Implications for Aviation Safety


New Refractive Surgery Procedures and Their Implications for Aviation Safety

Nakagawara, Van B.; Wood, Kathryn J.; Montgomery, Ron W. U.S. Federal Aviation Administration (FAA) Office of Aerospace Medicine. DOT/FAA/AM-06/9. Final report. April 2006. 45 pp. Figures, tables, references, appendixes. Available via the Internet at <www.faa.gov/library/reports> or through the National Technical Information Service.**

Since the 1980s, U.S. pilots have been allowed to correct refractive error — an eye defect that prevents light rays from focusing on the retina — by undergoing surgery. The types of refractive surgery, which formerly consisted mainly of photorefractive keratectomy (PRK) and laser in situ keratomileusis (LASIK), have recently been augmented by new surgical techniques such as laser epithelial keratomileusis (LASEK), laser thermal keratoplasty (LTK), conductive keratoplasty (CK) and others.

The report describes the techniques of the recently developed procedures and their applications, advantages and risks. The text includes summaries of experimental results, which are enhanced by extensive references to the clinical literature.

"It is unknown at this time how the long-term effects of refractive surgery may affect the performance of civil airmen and if the known refractive surgery complications summarized in this paper may be exacerbated by age," the report says. "It is important that pilots be aware of possible problems that may result from having refractive surgery that may affect their ability to safely perform aviation tasks."

WEB SITE

ASRS Database Online, <http://asrs.arc.nasa.gov/main.htm>

The aviation safety reporting system (ASRS), administered by the U.S. National Aeronautics and Space Administration, now allows everyone access to its large incident database of unsafe occurrences and hazardous situations.

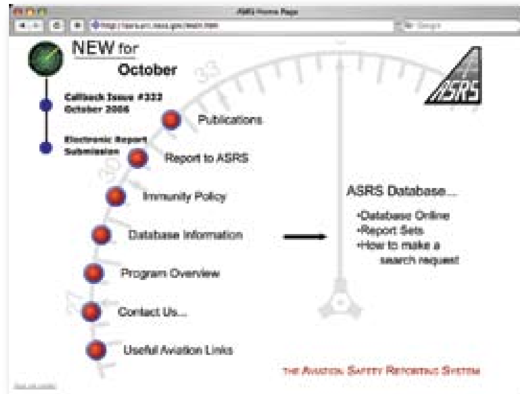
ASRS describes itself as "the world's largest repository of voluntary information provided by aviation's frontline personnel, including pilots, controllers, mechanics, flight attendants and dispatchers." Currently, more than 130,000 incident records compiled from more than 700,000 submitted reports are in the database. The online database contains incident records from 1988 to the present and is updated monthly.

The purpose of the program is "to lessen the likelihood of aviation accidents." Data are used by government, industry and academia to identify and remedy deficiencies and discrepancies in the aviation system; formulate policy and planning; and support human factors safety research. Depending on an individual researcher's needs and creativity, any number of uses are possible — education and training aids, examples of specific event types, identification of risks associated with certain actions, and information to support a personal opinion or observation, to name a few.

Confidential incident reports of occurrences in the most recent month are submitted to ASRS, where they are analyzed by a professional staff of former air traffic controllers and pilots. Identifying information is removed to protect confidentiality, and safety hazards are identified and flagged. The U.S. Federal Aviation Administration (FAA) or the U.S. National Transportation Safety Board (NTSB) determines whether to corroborate reported events and address remedies. The reporting system is non-punitive, and the FAA cannot use these reports for enforcement action. There are two exceptions – accident reports are forwarded to NTSB and reports involving criminal offenses are forwarded to the U.S. Department of Justice.

Reports of events appearing in the database are "soft" data, meaning that the data should be reviewed with care. Submissions are selectively corroborated, reporter biases and perceptions may exist, and multiple reports of the same incident may be combined into a single record. Individual database records can contain more than 40 categories of information, plus the reporter's narrative and a brief synopsis.

With so much information, getting the information that is wanted could be challenging. However, the database employs sophisticated search features and precise criteria selection. Researchers



are given drop-down selection lists with recognized aviation terms. Narratives of individual records usually contain FAA terms and abbreviations and ASRS codes unique to this database, so ASRS provides encoding and decoding lists on line. Researchers can print all information as it appears on the viewing screen or reformat search results for customized reports.

This database is complex. Users will benefit from reviewing background and supporting information in advance of searching. For optimum results, they should read descriptions of database content and structure and ASRS's recommendations for creating queries, formulating search strategies, manipulating data and displaying reports.

Until now, access to this type of information has been limited. Researchers had to contact ASRS directly, or access brief reports of similar data at the FAA's National Aviation Safety Data Analysis Center (NASDAC) web site, using a search form with limited options and a search engine with limited capability. (NASDAC was recently renamed Aviation Safety Information Analysis and Sharing [ASIAS].) ●

Sources

* Australian Transport Safety Bureau
P.O. Box 967, Civic Square
ACT 2608 Australia
Internet: <www.atsb.gov.au>

** National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161 U.S.A.
Internet: <www.ntis.gov>

— Rick Darby and Patricia Setze