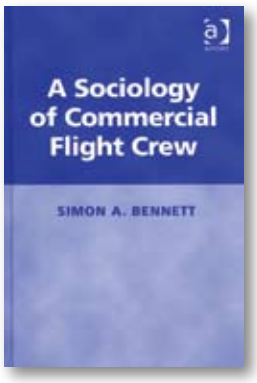
Pilot Project

A sociological study of airline pilots finds that most report satisfaction in their jobs, but some are alienated from management and have safety-related concerns.

BOOKS

A Sociology of Commercial Flight Crew

Bennett, Simon A. Aldershot, England, and Burlington, Vermont, U.S.: Ashgate, 2006. 224 pp. Tables, appendixes, bibliography, index.



This study looks at airline pilots from an angle that Bennett says has been more or less bypassed previously — how pilots are affected by the social environment they inhabit.

A pilot, Bennett says, is "a social actor. That is, someone with a history; a work life; a home life; a social life; someone caught up in numerous social and economic networks." Six in-depth interviews and questionnaire responses were designed to give a coherent picture of pilots' interactions with their profession.

One reason for the study, the author says, is that "the success of commercial aviation is due … to the imagination, ambition and dedication of its employees. In my opinion, commercial aviation's future prosperity depends in large part on developing more subtle understandings of those who work in the industry. Only if the industry understands its key resource can it be nurtured and used to best effect."

The social setting in which pilots work also has safety implications. "The introduction of crew resource management … has served to flatten (but not eliminate) the flight deck's authority gradient," Bennett says. "To improve safety margins, much of the imperiousness of the rank of captain has been engineered away. First officers (and flight attendants) are encouraged to contribute to the management of the flight and to seek clarification from the captain if, on the basis of a piece of information known only to themselves, they believe a decision to be ill-advised."

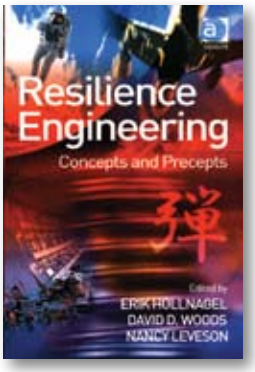
Pilots' responses to the questionnaire and in interviews yielded primary data, mostly *verbatim* comments. Concerns included how interaction with management at their airlines potentially affects safety, although it cannot be determined from the sample group how representative such concerns are among airline pilots.

One pilot said that commercial pressures created a "hidden culture of short cuts." The pilot said, "Turnaround [between-flight] issues revolve around safety and blame. Nobody minds working fast to get the job done, but there can be perceived pressure to take short cuts. It is as much about perceived pressure [as] of actual pressure. The airline will be very sure to leave a good audit trail of its procedures to show on paper that everything is being done correctly, but it is not the projected culture that counts, it is the hidden culture, the whispers between pilots, discussions over coffee, chats during turnarounds."

Another pilot said, "We need more respect from the management group, nonpartisan safety departments, and rules and regulations that do not contain the words 'where possible'; 'may'; [and] 'taking into account all the factors.'" Another cited "commercial pressure; a management attitude that finance is everything; performance-related pay awards when a human resources desk jockey tells me how I am flying

my airplane, and consequently what my pay raise will be."

Nevertheless, to judge from the *verbatim* quotes, most pilots still enjoy, and some even get a thrill, from what they do. "Sense of achievement," "financial security" and "camaraderie" are frequently reported phrases. One said, "As a pilot, you feel part of the plane. There's nothing to beat climbing up through the cloud first thing in the morning on a gray day with dawn breaking and seeing all those wonderful colors. I love what I do, and even if I won the lottery tomorrow, I'd go on flying."



Resilience Engineering: Concepts and Precepts

Hollnagel, Erik; Woods, David; Leveson, Nancy (editors). Aldershot, England, and Burlington, Vermont, U.S.: Ashgate, 2006. 409 pp. Tables, figures, bibliography, index, appendix.

The concept of resilience in systems design has received considerable attention in recent years (*Aviation Safety World*, December 2006, page 54). Resilience is among the latest generation of risk management principles that go beyond reactivity. The trouble with a reactive method — looking at past accidents to find ways to keep the same sort of accident from happening again — is that it is ill suited to today's understanding of accident causation as the result of a complex interaction of human, mechanical and institutional factors, rather than single-point operator errors or chains of causation.

Hollnagel and Woods say that "failure, as individual failure or performance failure on the system level, represents the temporary inability to cope effectively with complexity. Success belongs to organizations, groups and individuals who are resilient in the sense that they recognize, adapt to and absorb variations, changes, disturbances, disruptions and surprises — especially disruptions that fall outside of the set of disturbances the system is designed to handle."

The book explores many aspects of resilience as the ability of systems to anticipate and adapt to failure. "Resilience engineering is a paradigm for safety management that focuses on how to help people cope with complexity under pressure to achieve success," Hollnagel and Woods say. "It strongly contrasts with what is typical today — a paradigm of tabulating error as if it were a thing, followed by interventions to reduce this count. A resilient organization treats safety as a core value, not a commodity that can be counted. … Rather than view past success as a reason to ramp down investments, such organizations continue to invest in anticipating the changing potential for failure because they appreciate that their knowledge of the gaps is imperfect and that their environment constantly changes."

Resilience engineering begins, they say, with a focus on methods and tools:

- To analyze, measure and monitor the resilience of organizations in their operating environment;
- To improve an organization's resilience vis-à-vis the environment; and
- To model and predict the short- and long-term effects of change and line management decisions on resilience and, therefore, on risk.

REPORTS

Fire Safety of Advanced Composites for Aircraft

Mouritz, A.P. Australian Transport Safety Bureau (ATSB). B2004/0046. April 2006. 36 pp. Figures, tables, references. Available via the Internet at <www.atsb.gov.au/publications/2006/grant_20040046.aspx> or from ATSB.*

"Without careful management and strict safety regulations, the risk of aircraft fires could increase with the growing use of fiber-reinforced polymer composite materials in aircraft," the report says. "Many polymer composites rapidly ignite when exposed to fire and generate high amounts of heat, blinding smoke and choking fumes. The careful selection of fire resistant composite materials is essential to aircraft safety."

Researchers performed a comprehensive review of the scientific literature to develop a database of the fire properties of many polymer composites, which are used both structurally and in cabins. Properties included time to ignition, limiting oxygen index, peak and

average heat-release rates, total heat release, flame-spread rate, smoke and combustion gases. Tables present the composite materials, ranked from best to worst in fire safety terms. Currently used composites and others that may be used in future designs are included.

Glass-reinforced phenolic composites are the most common of those used in cabins, and the database shows their excellent fire reaction performance. Carbon-reinforced epoxy composites, those with the most frequent structural applications, have poor fire resistance, according to the data.

Color and Visual Factors in ATC Displays

Xing, Jing. U.S. Federal Aviation Administration (FAA) Office of Aerospace Medicine. DOT/FAA/AM-06/15. Final report. June 2006. 22 pp. Figure, tables, references, appendixes. Available via the Internet at <www.faa.gov/library/reports> or through the National Technical Information Service.**

Current computer technology makes it easy to use color for identification or differentiation on the digital displays used by air traffic controllers. FAA has no requirement for how color should be used on air traffic control (ATC) displays. The variety of color designs suggests that manufacturers, in creating unique color schemes, disagree with one another or have not seriously considered the human factors aspects of color choices for the ATC environment, the author says. Furthermore, some ATC displays allow individual users to configure the color coding to suit themselves.

As a result, the color stylization of the same information can vary from one ATC facility to another or even within the same facility, with a resulting potential for confusion, the report says. Also a matter for concern, it adds, is that using color symbolism has drawbacks as well as benefits, and those drawbacks are not widely understood.

The researcher visited nine ATC facilities to learn how controllers used computer displays and color information in performing their tasks, to identify color usage and relevance to ATC tasks, to determine the purposes of color use and to discuss with facility representatives the advantages and problems involving colors on displays.

"In this report, we described the benefits of color use in ATC displays," the researcher says. "We also derived a rationale for how to achieve these benefits based on accumulated vision and cognitive research. We also identified several drawbacks of color use in ATC displays and presented the potential consequences of inappropriate use of colors in the domain of perceptual and cognitive information processing."

An example of misjudged color design, the report says, is using the same color for different purposes, or in contradiction to a convention that controllers have assimilated through experience.

"For example, red is usually the top choice to convey warning and alert messages," the report says. "Controllers would naturally infer that a red code conveys urgent information, and the attention to red reduces awareness of other information. Problems arise when the color is used to encode an aircraft's destination, even though the destination is no more important than that of any other aircraft. When two meanings are associated with the same color code (e.g., urgency, destination), the brain has to exert extra effort to suppress one meaning to correctly interpret the meaning of that code."

The report also says that adding more colors reaches a point of diminishing returns, and that although controllers generally prefer color displays, studies indicate that colors make their job seem easier but do not improve efficiency.

WEB SITES

Air Data Research, <www.airsafety.com>

This organization offers a weekly *Air Safety Newsletter* delivered by e-mail that alerts readers to newly released and revised accident reports from numerous countries and accident investigation boards. Internet links to the reports are provided.

The newsletter may also contain news, data and other information released by the U.S. National Transportation Safety Board and the U.S. Federal Aviation Administration.

Its publisher says that *Air Safety Newsletter* addresses research needs of aviation safety

investigators and analysts, and that "distribution is provided at no charge to persons actively employed in the fields of aviation accident investigation, analysis or litigation."

Flight Safety Information (FSINFO), <www.fsinfo.org>

Aviation enthusiasts who follow news from around the world may find *Flight Safety Information Newsletter* helpful. FSINFO compiles a daily newsletter of aggregated global aviation news from newspapers, Web sites and other sources. The newsletter is delivered by e-mail one or more times daily at no charge. Issues contain a combination of original and summarized text, with links to electronic sources.

Visit the Web site to register for the newsletter. While at the Web site, readers can peruse an online library that lists full-text articles, magazines like *Flight Safety Information Journal* and reports.

A bonus to receiving the electronic newsletter is its Web links to original news sources. Readers following breaking news about a particular aviation event may find a link to local or national media near the event. For example, a news article about an aviation event in Singapore may contain a link to a local source, such as *The Straits Times* newspaper, where additional information is available.

AUDIO-VIDEO

Safety Around Helicopters

Civil Aviation Authority of New Zealand (CAA) and Video New Zealand. DVD. 70 minutes. June 2006. Available on loan from CAA*** or by purchase from Video New Zealand.****

The video is divided into modules. The first, "Introduction," is appropriate for everyone who operates in or around helicopters. It includes basic operational information and best practices for approaching an aircraft and using doors and seat belts. Other modules are mission-specific.

"Going Bush" describes safety requirements for transporting hunters. "The Mountains" includes the safety briefing and embarking and disembarking procedures for transporting skiers and snowboarders. "Industry" shows how to prepare a helicopter site, including checking for dangerous wires. "All at Sea" is about methods for safe retrieval of a person from a boat. "Corporate and Tourism" discusses passenger briefings that vary with the helicopter type and destination. "Rescue on the Land" shows how an injured farm worker is rescued.

"Helicopter Identification" includes the main types of helicopters being used in New Zealand, with information such as the location of doors.

There is no regional code, and any functional DVD player can read the disc. ●

Sources

* Australian Transport Safety Bureau
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Internet: <www.atsb.gov.au>

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