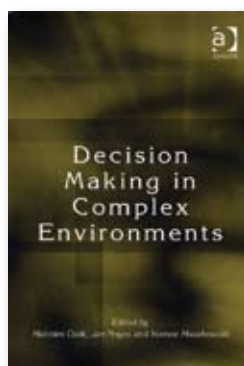


# Decision Management

The vast amount of information available to today's decision makers is being studied to find out how it can be optimally used.



## BOOKS

### Decision Making in Complex Environments

Cook, Malcolm; Noyes, Jan; Masakowski, Yvonne (editors).  
Ashgate: Aldershot, England, and Burlington, Vermont, U.S., 2007.  
458 pp. Figures, tables, references, index.

Decision making is not what it used to be. It's a great deal more complicated. In our globalized, technologically linked world, information is constantly changing and increasing almost faster than anyone can keep up with it. Decisions tend to affect more people in a larger sphere of influence.

"Today, we are inundated with a plethora of information, e-mails and ever-changing software," Masakowski says. "It is imperative that we master the critical components of knowledge management and decision making that will enhance and empower the individual and/or nation."

Automation, as usual, has both helped and created its own concerns. "There has been significant progress made in the development of technologies that serve to modify data, reduce the clutter and present information/knowledge in a manner in keeping with human information processing," Masakowski says. "However, there is still a need to be aware of the trade-offs involved between the human decision maker and those automated technologies that support their decision maker. Currently, we are faced with an abundance of information that challenges our attention and cognitive capacities, as well as placing increased demands on time management."

Besides several chapters on general characteristics of complex decision making, the

book considers its application in several fields. A number of them by various contributors are relevant to aviation. Examples of those chapters include the following, with brief samples of observations made in them:

- "Human Information Processing Aspects of Effective Emergency Incident Management Decision Making": "Effective incident commanders functioned as if they had a good practical understanding of the limitations of their information processing system. ... They had developed a rich network of decision rules organized in schemas [tentative internal representations of the outer world] which enabled them to use, mostly, fast, rule-based, robust *recognition* decision processes rather than slow, vulnerable, knowledge-based analytical problem solving processes, which involve heavy demand [on] working memory capacity."
- "Air Traffic Controller Strategies in Holding Scenarios": "The difference in pattern matching [of two randomly selected controller groups in an experiment] highlighted one of the main differences between the sequencing of simple or complex traffic flows. The controllers sequencing the simple traffic flow mainly ordered the traffic according to patterns of traffic in a plan view. The controllers viewing the complex traffic flow considered the flight level of the aircraft more important and sequenced traffic according to the vertical view of the aircraft."

- “The Flight Deck of the Future: Field Studies in Data Link and Free Flight”: “Data link has the potential to offer the ‘permanence’ of information in a way that buffers the vulnerability of working memory. This would allow air traffic control officers to devote their cognitive resources to other demanding cognitive tasks, for example, solving conflicts and so on.”
- “The Flight Deck of the Future: Perceived Urgency of Speech and Text”: “From the findings it is clear that both speech and text commands in expected or unexpected situations have their relative merits. It is likely that in routine, low-workload communications, such as a request for a change in [altitude] as stated on the flight plan, the use of data link could avoid errors that may occur due to mishearing, low radio quality or perceptual confusion between two similar flight numbers. However, for non-routine situations, such as a pilot running low on fuel, the potential impact of data link could be more critical.”

## REPORTS

### Understanding Safety Culture in Air Traffic Management

Eurocontrol Experimental Centre. EEC Note 11/06. September 2006. 50 pp. Figures, tables, annexes. Available via the Internet at <[www.eurocontrol.int/safety/gallery/content/public/EEC\\_note\\_2006\\_11.pdf](http://www.eurocontrol.int/safety/gallery/content/public/EEC_note_2006_11.pdf)>.

Safety culture is important in air traffic management (ATM) even when other elements of a safety management system (SMS) are already in place, according to this report based on a survey of 52 staff members of European air navigation service providers (ANSPs). “The results suggest that whilst a good SMS is necessary, it may not be sufficient,” the report says.

Although the term “safety culture” has been used over the past few years in ATM, it is not always clear what it means in that context. The report is intended to clarify the concept, based on the results of the survey, which was administered by interviewers. “The various interview results were pooled to generate a large list of

issues,” the report says. “Several of the analysts were involved in clustering these into a set of comprehensive safety culture elements.”

Safety culture elements, which were also categorized into sub-elements, comprised “safety management commitment,” “trust in organizational safety competence,” “involvement in safety,” “ATCO [air traffic controller] safety competence” and “a just, reporting and learning culture.” Analyzing statements extracted from the interviews, the researchers found examples of practices that “enable” or “disable” safety culture in each sub-element.

For example, in the sub-category of “communication about changes,” disabler examples include “new procedures are issued by staff notice”; “there is only one accessible computer with the information and no verification that controllers understand”; and “people sometimes forget to do the computer-based briefing before [a] shift.”

In the same sub-category, enabler examples include “safety briefing by station manager with team outlines new staff notices, new activities, restrictions, etc.”; “for big changes, controllers are given training in simulations”; and “maintenance engineers communicate with controllers before touching a system.”

### Birdstrike Risk Management for Aerodromes

U.K. Civil Aviation Authority, Safety Regulation Group. CAP 772. First edition. March 2007. 48 pp. Figures. Available via the Internet at <[www.caa.co.uk/docs/33/CAP772.pdf](http://www.caa.co.uk/docs/33/CAP772.pdf)> or from The Stationery Office.\*

“The bird strike risk is not uniform across all types of aerodromes and flight operations, and therefore it is essential that the most appropriate measures are identified and adapted to suit the local situation,” the report says. “Effective techniques in risk assessment, bird control, habitat management and safeguarding exist that can reduce the presence of birds on aerodromes and the risk of a bird strike.”

Risk identification is an important prerequisite to risk reduction. “The level of ambient bird strike risk, which is the level and type of bird activity that would occur in the absence of any monitoring or control measures, should be determined,” the report says. Without this baseline

measurement, it is hard to gauge the effectiveness of risk reduction techniques.

The assessment process typically involves, among other things, identifying bird species and habitats in the area; the probability of a strike with each species, considering current mitigation procedures and seasonal factors; the size and numbers of each species, including whether the birds are solitary or in flocks; and the frequency of serious strikes involving multiple birds. Taking all factors into account, the acceptability of the level of risk can be plotted on a matrix with scales for severity and probability, both ranging from very low to very high.

The chapter on risk reduction includes sections on habitat management, bird dispersal and safeguarding — keeping an eye on new or proposed land-use development outside the airport perimeter that could attract birds to the area.

Managing the habitat that offers birds food or security can in some cases be as important as dispersion. The report calls management of grass areas “the most effective habitat control measure,” with both short and tall grass attracting birds, and recommends maintaining grass at a height of 100 to 200 mm (4 to 8 in). Management might include eliminating or reducing the fruit- and berry-producing plants that attract birds. Other techniques include clearing out buildings or structures that invite roosting, draining standing water, piping water streams underground, and blocking landfill and sewage sites from birds.

Noise can be useful in dispersal, but the noise must be one that the birds do not become quickly habituated to, the report says. Birds have their own “language” for warning one another, and effective sounds include recorded signals from other birds that indicate danger or distress, such as when captured by a predator. Distress cries are usually most effective when they come from a bird’s own species, the report says. Waterfowl are mostly immune from dispersal through sound: “They feel secure on the water and, if threatened, tend to remain there.”

For those whose bird knowledge could use a boost, the final chapter, “Aerodrome

Ornithology,” offers guidance in identification, biology and behavior by species.

## ELECTRONIC MEDIA

### Archives of the Aerospace Medical Association Journals

This DVD contains 73 years (1930–2002) of full-text articles from three magazines — *Aviation, Space, and Environmental Medicine* and its two preceding titles, *Aerospace Medicine* and *The Journal of Aviation Medicine*. All have been published by the Aerospace Medical Association.

Special features help researchers quickly access the 16,691 titles: an index for browsing by publication date, article title, author and magazine, plus basic and advanced search capability. Articles may be printed, saved or read on the computer monitor. Articles include tables, figures and references as they appeared in print.

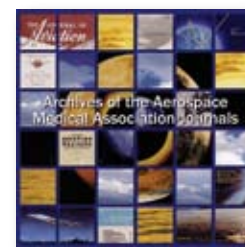
The DVD is priced separately for members, nonmembers and institutions. Order information is available at the association’s Web site, <[www.asma.org](http://www.asma.org)>, or from Sheryl Kildall at <[skildall@asma.org](mailto:skildall@asma.org)>.

## WEB SITES

### Aerospace Medical Association (AsMA), [www.asma.org](http://www.asma.org)

AsMA is an international organization with a “membership [that] includes aerospace medicine specialists, flight nurses, physiologists, psychologists, human factors specialists and researchers in this field. Most are with industry, civil aviation regulatory agencies, departments of defense and military services, the airlines, space programs, and universities.”

AsMA describes aerospace medicine as a “branch of preventive medicine that deals with the clinical and preventive medical requirements of man in atmospheric flight and space.” This description, an overview of major issues affecting those who function in the “abnormal environment encountered in aviation and space,” and information about a career in this unique





field of medicine are available to members and nonmembers in “This Is Aerospace Medicine,” a 63-slide presentation, posted on the Web site.

The publications section of the Web site contains other items free to nonmembers. Some are written for travelers; some, such

as *Medical Guidelines for Airline Travel* (second edition, May 2003, 22 pp.) are directed to medical professionals. AsMA says the document was written for “physicians [who] need to understand the world of commercial flight, environmental and physiological stresses, and vaccination requirements in order to properly advise patients.” The guidelines address specific medical conditions that may be pre-existing or manifest in flight.

Portions of AsMA’s peer-reviewed journal, *Aviation, Space, and Environmental Medicine*, are available free to nonmembers — tables of contents and abstracts of monthly issues, plus selected full-text articles. *Medical News*, a section of the journal that informs readers about organizational and medical news, is also online at no charge.

Links to constituent and affiliated organizations with purposes and objectives similar to those of AsMA, such as the Aviation Medical Society of Australia and New Zealand, and related professional and commercial organizations are included at the Web site. Its multi-media online bookstore sells items of interest to members and nonmembers.

(Editorial note: Dr. Russell B. Rayman, executive director of the Aerospace Medical Association, is a member of the *AeroSafety World* editorial advisory board.)

**Haldale Media Group, [www.haldale.com](http://www.haldale.com)**

Haldale publishes products for the training and simulation industry that serves aviation. The Haldale Web site provides

several aviation products free and online.

Current and archived full-text issues of *CAT: The Journal for Civil Aviation Training* are available in digital format and can be read online or printed. Haldale says that *CAT* has a regional and international focus in its reporting on “training challenges and solutions” for commercial aviation.

The World and Regional Aviation Training Conference and Tradeshow (simultaneous programs focusing on airline pilot, cabin crew and maintenance training, referred to within the industry as WATS/RATS) “brings together leading aviation training companies to discuss the evolution of training equipment, regulations and processes,” according to the Web site. In addition to providing information about upcoming events, the site provides complete presentations from the previous conference. Two examples of agenda items from the 2007 event are “Pilot Technology-Driven Training: The New Aircraft and System Challenges” and “WATS/RATS Pilot Air Carrier Training Insights.”

Presentations from the same conference addressing cabin crew subjects such as “Safety, Egress/Emergency Evacuation Training” are offered online to be read or downloaded. Some presentations contain audio and video clips. Proceedings from the 2007 maintenance conference are also available.

Likewise, there are full-text presentations from the 2006 European Aviation Training Symposium, which focused on suppliers of training products to the European air transport market. “Safety and Unexpected In-Flight Events” and “Advances in Flight Training Technology” were two of several session topics discussed.

Free international directories and guides to providers of simulation equipment, training products and services are provided through the <[haldale-directories.com](http://haldale-directories.com)> Web portal and on CD. ●

**Source**

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— Rick Darby and Patricia Setze