Traffic Jam

Europe is upgrading its air traffic management, but safety information flow within the system is held back by fears of legal repercussions.

BOOKS

European Air Traffic Management: Principles, Practice and Research

Cook, Andrew (editor). Aldershot, England, and Burlington, Vermont, U.S.: Ashgate, 2007. 277 pp. Figures, tables, appendix, bibliography, index.

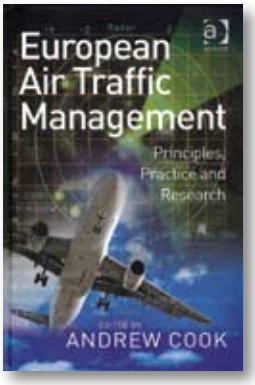
"As part of the future air ATC/ATM [air traffic control/air traffic management] service for Europe, aircraft will be controlled accurately and with high integrity in four dimensions [latitude, longitude, altitude and time] with the aid of on-board and satellite navigation and communications technologies," says one contributor to this book, an across-the-board look at European ATM. "Each aircraft will negotiate and re-negotiate a 4D [four-dimensional] flight plan in real time with the ground-based ATM system. This will provide airborne autonomous separation to give conflict-free tracks between origin and destination in the form of 4D profiles to be accurately adhered to by aircraft."

That will be then; this is now. Although ATC will arguably change more radically than any other part of the aviation system in the coming years, for the moment it remains largely in the hands of traditional controllers operating on the basis of radar coverage and voice or datalink radio communication.

European ATM must accommodate a growth in demand for air transport while maintaining or improving current safety levels. Technical innovations, such as reduced vertical separation minima, and administrative initiatives, such as the Single European Sky legislation adopted in 2004 to reorganize air navigation service providers into functional sectors independent of national boundaries, are helping to increase capacity, the book says.

In a chapter titled "ATM and Society — Demands and Expectations," contributor Nadine Pilon says that current forecasts predict a doubling of air traffic in Europe by 2025. "This predicted growth of flights may produce more incidents in absolute numbers, and increases the risk of collision," she says. "In order to maintain its adequate level of safety, the air transport industry, and in particular ATM, implements continuous reinforcements of safety assurances, but this has little repercussion on the *perception* of risk."

The development of land for housing and business in ever-growing areas around cities may also increase the perception of risk because of accidents during takeoff or approach. The two most dramatic accidents that resulted in people on the ground being killed were the El Al 747 accident in Amsterdam in 1992 and the Concorde accident at Roissy, near Paris Charles de Gaulle Airport, in 2000.



"It appears that society could be becoming more sensitive to, and more aware of, air transport safety risks and/or environmental impacts, and possibly becoming less tolerant of operational errors," Pilon says. "An illustration is the case of the Linate [Airport, Milan] accident where a runway incursion resulted in a collision, with fatalities, in 2001. Both the judicial investigation and the technical investigation were heavily reported in the press, in particular in the regional newspapers. The trial resulted in eight ATM personnel (from front-line operations to top management) being jailed. The way in which this, and a number of similar cases, were reported in the press and handled in the courts … identifies a lack of support by society for air traffic management. There remains a tendency for these cases to be addressed not only through

changes in the system but, additionally, by establishing culpability and punishment on the basis of personal liability. This poses the question of whether such cases point to a trend where, in modern societies, air transport is considered a mature industry in which failures of that system are less and less tolerated."

Concern about ATM-related accidents naturally leads to calls for measuring the system's safety. But European ATM, Pilon says, is "not providing at the European level a satisfactory indication of the level of safety it produces, as stated by the Performance Review Commission [of Eurocontrol in a 2006 report]."

Safety cannot easily be measured by the number of ATM-related accidents, which is quite low overall, so that a single major accident can cause a huge spike in the rate. "That is the reason why reporting on safety occurrences and incidents is required: In some cases, a safety occurrence may indicate that safety has been compromised and therefore lead to improvements," Pilon says. "However, this genuine demand for transparency may, in some cases, cause difficulties for air traffic management on account of the safety culture, confidentiality and even legal issues."

Pilon says that the flow of incident information can be limited for several reasons:

- "In organizations such as ATC, team issues play an important role, and a strong safety culture is crucial for safety. Efficient safety reporting is based on trust and therefore takes a long time to become fully embedded in the organization — and can soon be rejected. While in some operational units, implementing safety reporting can be seen as a catalyst for reinforcing the safety culture, it can also be detrimental in other instances where it seems to run counter to trust."
- "Individuals should voluntarily report their own errors and any other dysfunction of the ATM system, and such reports, rendered anonymous, should be made available for safety improvement. When considering the way safety analyses, investigations and improvement measures are carried out, some may see certain confidentiality clauses as being over-restrictive, however. A delicate issue to resolve."
- "In the case of a legal inquiry, any requested data or file will be released to the judicial authority, regardless of any confidentiality agreement. In certain countries in Europe, even when no accident has actually occurred, staff may still be prosecuted because of a safety incident."

To counteract inhibitions about reporting safety information, the ATM community and Eurocontrol, for example, through the SAFREP [Safety Data Reporting and Data Flow] task force, are promoting the idea of "just culture" in ATM. Eurocontrol says that "the SAFREP task force found that punishing air traffic controllers or pilots with fines or license suspension, as well as biased press reports, has led to a reduction in the reporting of incidents and sharing of safety information. It also recognized that the need for a culture that encourages honest reporting is not yet reconciled with the judicial system and legislators. It warns that the situation may get worse if no immediate action is taken."

REPORTS

An Overview of Spatial Disorientation as a Factor in Aviation Accidents and Incidents

Newman, David G. Australian Transport Safety Bureau (ATSB) Aviation Research and Analysis Report B2007/0063. Final report. December 2007. 42 pp. Figures, references. Available via the Internet at <www.atsb.gov.au/publications/2007/B20070063.aspx> or from ATSB.*

The prevalence of spatial disorientation (SD) as a factor in aviation incidents and accidents is hard to establish, the report says. In incidents, or when SD occurs with no accident or incident resulting, it may go unreported. And "many accidents where SD is cited [by investigators] as a likely factor are fatal," the report says.

"SD is defined as the inability of a pilot to correctly interpret aircraft attitude, altitude or airspeed in relation to the Earth or other points

of reference," the report says. "It is a very common problem, and it has been estimated that the chance of a pilot experiencing SD during [his or her] career is in the order of 90 to 100 percent. The results of several international studies show that SD accounts for some 6 to 32 percent of major accidents, and some 15 percent to 26 percent of fatal accidents."

The report describes three types of SD:

- Unrecognized. "The pilot, unaware of the problem, continues to fly the aircraft as normal. This is particularly dangerous, as the pilot will not take any appropriate corrective action, since [he does] not perceive that there is in fact a problem. … This form of SD is clearly dangerous, and accounts for the majority of SD accidents and fatalities."
- Recognized. "The pilot becomes aware that there is a problem. While the pilot may or may not be aware that the problem is SD, in this form of disorientation [he is] aware that something is not quite right, that [his] sensory system is giving information that does not agree with the information available from the instruments, or that things just don't add up. … If this is successfully dealt with, an SD accident does not tend to result. The pilot may then have received a valuable lesson on SD and how to recover from it."
- Incapacitating. "The pilot may be aware of the disorientation, but is mentally and physically overwhelmed to the point where [he is] unable to successfully recover from the situation. The pilot may fight the aircraft all the way to ground impact, never once achieving controlled flight. Such forms of disorientation are a result of breakdowns in the normal cognitive processes, possibly due to the overwhelming nature of the situation, especially if other factors such as fatigue and high workload are also present."

The report describes various types of illusions: some known as vestibular, because they are caused by sensations in the vestibular system, or inner ear; others visual, which can occur even in visual meteorological conditions and are often based on expectations that override what the pilot actually sees.

Possible contributors to SD include pilot factors, such as flying while experiencing an illness that affects the vestibular system, or while taking medication with a similar effect; aircraft factors, for example, lack of an autopilot or the presence of a malfunctioning autopilot; operational factors, such as inadvertent entry into instrument meteorological conditions (IMC) by pilots without an instrument rating, or prolonged acceleration; and environmental factors, including the lack of visual cues, as when an approach is flown at night over water — prompting the "black hole" illusion that gives a false mental picture of altitude above terrain.

"The chances of an SD event occurring in flight can be reduced by a series of simple preventive measures, many of which can be attended to before flight," the report says. "These include flying when fit and well … , not flying under the influence of alcohol or medications, avoiding [flying under] visual flight rules into IMC, [and] increasing awareness of SD illusions and planning for their possible appearance at different stages of flight in the preflight planning process.

"It is vitally important that pilots are aware that SD happens to normal pilots. It can affect any pilot, any time, anywhere, in any aircraft, on any flight, depending on the prevailing circumstances. Furthermore, experience of SD does not mean it will not ever happen again. Awareness and preparedness are key elements in preventing an SD accident."

WEB SITES

Centers for Disease Control and Prevention, <wwwn.cdc.gov/travel/contenttravelindustryair.aspx>

The Centers for Disease Control and Prevention (CDC) is a component of the U.S. Department of Health and Human Services. The CDC says that its mission is "to promote health and quality of life by preventing and controlling disease, injury and disability." In support of this mission, the CDC Web site shares

information with the public.

Sections of the site focus on health and safety information of interest to flight and cabin crewmembers and the aviation industry. The CDC provides instructional and guidance documents and reporting forms at no cost for downloading or printing.

The following requirement is noted on the air travel pages: "Based on federal regulations (42 CFR Part 71), CDC DGMQ [Division of Global Migration and Quarantine] requires reporting from international conveyances destined for the U.S. of all on-board deaths and certain illnesses suggestive of a communicable disease."

To meet this requirement, the CDC has compiled documents for flight crews and cabin crews that describe specific medical conditions and symptoms, list information to be gathered from ill passengers or crewmembers, and define thresholds for reporting. Some of the information is repeated as single-page, quick reference cards.

The CDC also provides scripts for public health announcements to be delivered to passengers prior to landing. Scripts are matched to scenarios to assist crews in selecting the appropriate announcement for different communicable-illness situations.

There are health and safety guidance documents for ground and maintenance workers; interior and exterior cleaning workers; personnel interacting with passengers; and baggage and cargo handlers who have been exposed to airplanes arriving from areas affected by communicable diseases such as avian flu and SARS (severe acute respiratory syndrome) virus.

Some of the other topics of possible interest to flight and cabin crewmembers are tuberculosis and meningitis; risks from food and water (drinking and recreational exposure); protection from insects and arthropods, principally spiders; and health tips and vaccination requirements for global travelers.

Literature references and Web site links to related information appear within documents and on the CDC site.

Asociación Latinoamericana de Aeronáutica, <www.ala-internet.com>

The Latin American Aeronautical Association (ALA) gives "the Latin American aviation community an organizational link to the global aviation industry." It informs "the Latin American aeronautical community on aviation topics and … promote[s] aviation safety."

On its home page, visitors can select English, Spanish or Portuguese language pages. The Web site has a Spanish-English/English-Spanish aeronautical dictionary, an encyclopedia of aviation photography and an English/Spanish directory of companies providing products and services to the aviation industry. All three are free online.

According to the organization, the ALA magazine is "the only Spanish/Portuguese language aviation magazine." Excerpts from the current year's magazines are also free online. ●

Source

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— Rick Darby and Patricia Setze