Passenger Perceptions of Airline Safety: Marketing Safety Records

A survey of four airline passenger groups suggests that the public wants more information about airline safety and would accept airline marketing based on safety performance. Although the air carrier industry has become crippled in today's economy, the 1991 survey identifies several significant perceptions of air travelers.

by
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The world's airlines are transporting more passengers and flying more miles than ever before. More than 480 million passengers are flown annually in the United States alone.

While accidents are rare, several studies suggest that passenger concerns about flight safety appear to be on the rise. A survey conducted by American Express, for example, shows increased interest on the part of business travelers for more information about flight safety and the safety performance of specific airlines.

In addition, other studies have shown that at least 30 percent of air travelers use perceptions of an airline's safety record as a basis for deciding which airline to choose.

Public awareness of airline safety issues is likely to increase in the 1990s. This growth will in part be simply a function of an increased number of passengers and frequency of travel. Even if the airline industry maintains its current accident rate, the raw number of accidents will increase because of the increase in flights. In this context, public perception of the airline industry is even more demanding.

Airlines are increasingly concerned about passenger perceptions of safety because they frequently change. And available evidence shows that airlines should try to reduce the number of flying unknowns in the public's perception of the aviation industry (Table 1, page 2).

Airline executives and marketers know that safety must be the driving force — the most important issue of airline management. A profitable but unsafe airline is not likely to remain profitable for long.

To identify passenger perceptions of airline safety and to determine what elements were of particular interest, a study was conducted that was based on responses from four passenger groups: National Business Travel

Association (U.S.) members (254), non-airline premium and incentive marketers (188), arriving passengers (406) at three airports (Los Angeles, San Diego and Dallas/Fort Worth) and upper-level students from two universities (92). Survey respondents ranged in age from 19 to 74, with an average age of 39.

The response rate was 25.6 percent for business association members; 23.9 percent from the marketers, 41.1 percent from arriving passengers and 76.1 from the students. The total sample response rate was more than 37 percent.

The survey, conducted in 1991, found that 63 percent of those polled did not believe there was enough safety-related information available to the public. In a breakdown of each group, 52 percent of the business travelers, 58 percent of the students, 46 percent of the arriving passengers and 40 percent of the marketers said that they did not believe there was enough safety information available.

The study also found that:

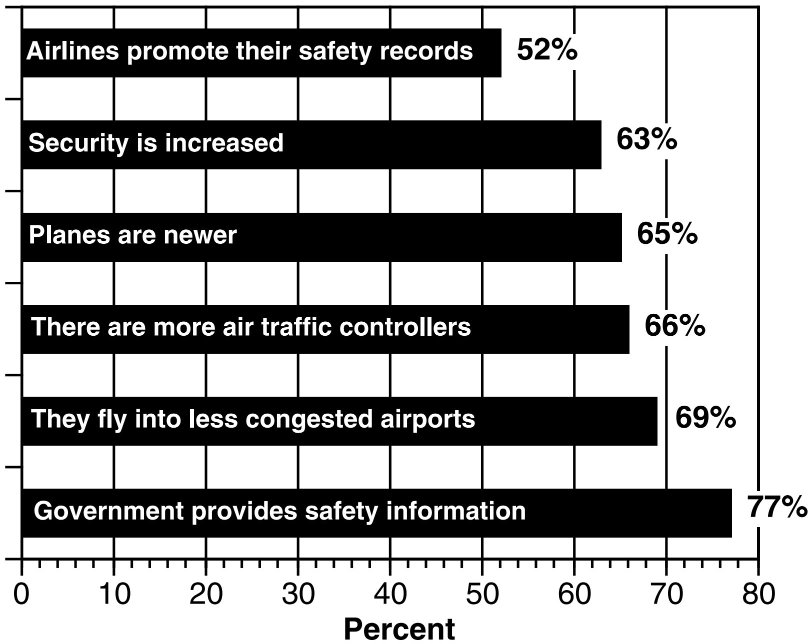
- At least 85 percent of the respondents would pay more for increased airline safety procedures. (At least 51 percent of all groups polled said that an

Table 1
Ranking of the Ten Most Important Safety Factors the Four Groups Consider When Choosing Airlines
Rank 1 = Most important safety factor (scale ranking 1-10)

Sources	NBTA*	Marketers	Passengers	Students	Overall
****Number of Respondents**	**65**	**45**	**167**	**72**	**349**
Recent Accident/ Results	2.5	1.5	1	1	1
Bad Weather Probability En Route	4	3	2.5	2	2
I Don't Think Of Safety	6	4	2.5	3	3
Aircraft Information	2.5	5	4	4.5	4
Airline Financial Operational Details	1	1.5	5	7	5
Security Information/ Performance	5	7	6	4.5	6
Crew Selection Training, Experience	7	6	7	6	7
Bomb threats, Hijackings	8	8.5	10	8	8
Detailed Maintenance Information	9	10	9	9	9
Aircraft Manufacturer	10	8.5	8	10	10

*NBTA = National Business Travelers Association
**All persons surveyed did not respond to all questions.
Source: Becker Associates

Table 2
The survey of the four passenger groups also indicated passengers feel much safer when:



Source: Becker Associates

increase in maintenance expenditures would justify fare increases.)

- 55 percent have a clear idea of what safety information is important and what details they want before choosing an airline.

- 69 percent said they wanted the government to provide airline safety information, while 59 percent said they would prefer to receive such information from the airlines or consumer groups.

Passengers are currently getting airline safety information from a variety of sources, according to the survey. Results indicate that 93 percent use newspapers at least "sometimes"; 88 percent use television reports at least "sometimes"; 81 percent use personal experience and news magazines at least "sometimes"; 78 percent use word of mouth "sometimes"; 61 percent use friends as source "sometimes." Libraries, travel agencies and manufacturers were less often used as an information source by the surveyed passengers (Table 4, page 4).

In 1988, the U.S. General Accounting Office (GAO) conducted a study on how to measure an airline's safety. It was designed to be used by both industry and the public. The GAO study also found problems in the availability of the safety information. Indeed, it remains difficult for the public to find details of an airline's performance quickly. The public is either forced go to libraries, access costly data bases or contact government agencies or the airlines themselves to get desired information. Worse, available information (as noted by the GAO study) is not uniformly measured or presented, making comparisons difficult.

The survey of the four passenger groups outlined several factors that made passengers feel much safer (Table 2).

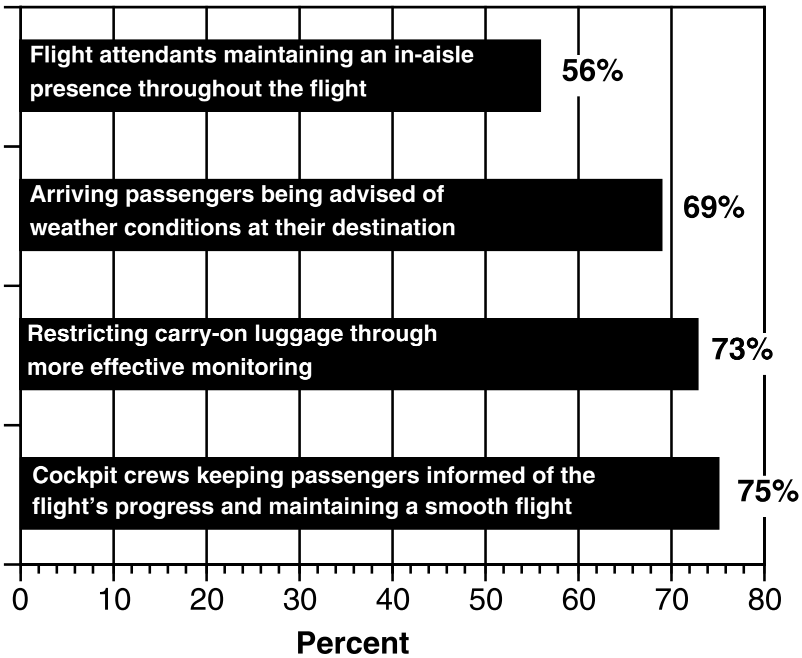
The survey also revealed inflight features that passengers said made them feel safer (Table 3, page 4).

Study results showed that nearly a majority (46 percent) of respondents avoid certain aircraft, with the most avoided being propeller-powered airplanes (26 percent).

In addition, the study indicated that passengers avoided airlines that had received fines from the U.S. Federal Aviation Administration (FAA) for maintenance or safety violations; airlines that were experiencing labor problems; carriers that were having financial problems; and those that flew into high-profile terrorist-prone cities (Table 5, page 5).

Public suspicions about airline safety may be aggravated by a survey of incidents for the four-year period from 1986-1990. Accidents and incidents during this period were attributed to metal fatigue, narrowly avoided midair collisions, engine mistakenly shut down, fuel

Table 3
Inflight features that passengers said made them feel safer included:



Source: Becker Associates

exhaustion, landing at the wrong airport, and engine failures or engine separations from aircraft. These incidents, taken individually, may not be a problem or indication of a crisis. But together they indicate to the public that something may be wrong and needs to be remedied.

Historically, the airline industry has not used safety comparisons or safety performance in advertising or promotion campaigns.

Some airlines may have the concern that if the safety issue is raised, it would open the floodgates and increase passenger fears. However, airlines know that passengers can and do generalize safety from other factors (although this may be due in part to not having adequate access to safety information). Traditionally, airlines have generalized the safety issue by showing excellence in maintenance, operations and quality of service. In the past, some airlines focused on this issue by discussing maintenance while subtly mentioning safety in their advertisements.

While airlines know that safety is an important issue, they may not know precisely how many passengers choose not to travel because the safety issue is not aggressively marketed.

Table 4
Ranking of the Most Frequently Used Source of Airline Safety Information as Indicated by the Four Passenger Groups

Rank 1 = Most frequently used source of information (Scale Ranking 1-7)

Sources	65 NBTA Members	45 Marketers	168 Passengers	73 Students	351 Overall
Government Agencies	1	1	1	1	1
Airlines	3	3	3	2	2
Consumer Groups	2	2	2	3	3
Researchers	5.5	4	4	5	4
Travel Agents	5.5	5	5	4	5
Business Associations	4	6	7	6	6
Manufacturers	7	7	6	7	7

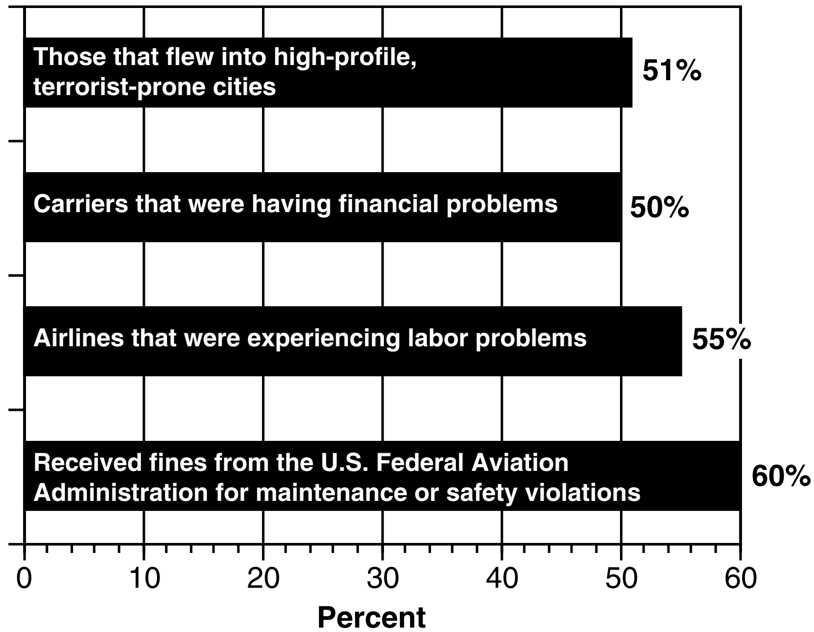
Source: Becker Associates

Airlines, faced with increased competition, must address the question of providing safety information to the public on a broader scale. The advantage of providing such information is that it allows control over its dissemination, thus reducing the risk of it being abused or misreported by other sources. Less desirably, regulations might be legislated to require information defined by mandate.

Safety information has become a consumer issue because of a number of industry changes, including a decline in the number of airlines, a dramatic increase in public awareness and concern over safety lapses (accidents) and airline attempts to find ways to differentiate themselves from competitors.

Study respondents indicated that they had very specific information requests about airline safety performance. For example, 47 percent indicated that they wanted to know more about detailed safety infractions of each airline (infractions include crashes, incidents and maintenance violations); 42 percent said that they wanted maintenance and operational performance explanations; 39 percent liked knowing detailed aircraft age information; and 22 percent put importance on detailed crew experience information.

Table 5
The study indicated that passengers avoided some airlines:



Source: Becker Associates

Thus, while there are differences among groups, most passengers want safety-related information that gives a detailed picture of airline safety, maintenance and operational performance along with information on aircraft age and crew experience. Most of this information is already available within the industry, but has not enjoyed wide distribution.

The survey showed that those persons who had access to information about flying and the aviation industry were more at ease when they were airline passengers.

Airlines that address the safety issue from a marketing perspective could increase passenger loads while reducing passenger fears (and perhaps increase the frequency of those who fly reluctantly).

The findings of the passenger survey suggest that the public is ready to accept airlines marketing themselves on the basis of safety.

Results of the passenger survey indicate that airlines can focus on a variety of operational and management considerations to enhance passengers' sense of airline safety. They include the following:

- Ensure that flights are as smooth as possible;
- Implement procedures for ground personnel to inform passengers prior to boarding about en route and destination weather. Cockpit crews should also update this information prior to landing;
- Develop procedures to maintain a constant cabin presence by flight attendants except during takeoff and landing preparations;
- Provide safety information about "how planes fly" on customized, inflight videos;
- Develop brochures to complement "fear of flying" seminars provided by industry professional and a few airlines;
- Develop a profile of a safety-sensitive traveler and brief ground and flight crews

on such a passenger's characteristics; and,

- Increase education on excellent overall safety records of all aircraft in the transportation fleet.

There is a wide diversity of safety perceptions about individual airlines. Those airlines with high, positive safety perceptions in the eyes of passengers should market and differentiate themselves in terms of these perceptions and the "scorecard" content. Much as airlines are promoting themselves today on the basis of on-time dependability, airlines in the future might add to their messages that they do very well in terms of low crash and fatality rates; experience few security breaches and have those inflight features that appeal to safety-sensitive passengers. They should also emphasize maintenance expenditures for training and equipment and the experience levels of their crews. Momentum is a powerful force in information dissemination, and this is especially true in relation to travel industry safety information.

Current technology can help airlines identify important subgroups from their passenger data bases. This allows airlines to market themselves to specific groups based on their safety sensitivity.

It has been found, for example, that women are more likely to avoid airlines that have experienced recent accidents or safety violation action. With this in mind, a program could be devised to educate this subgroup of airline passengers about the rarity of air crashes and what warrants safety and maintenance fines.

Growing public awareness and interest in airline safety shows that many passengers are no longer willing to simply accept or assume safety. This offers the industry a substantial opportunity to increase safety awareness, reduce fear of flying and to bolster passenger loyalty (and revenues). ♦

About the Author

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While at Braniff, Becker was director of passenger service at Dallas/Fort Worth International Airport, a post that included managing the airline's worldwide Boeing 747 operations. He was also director of marketing and membership benefits for the International Airline Passengers' Association.

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Copies of Becker's 167-page report on passenger safety attitudes can be obtained by contacting Becker Associates, 4474 La Cuenta Drive, San Diego, CA 92124 U.S. Telephone 619-569-7110.

U.K. Airmisses Involving Commercial Air Transport

by
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The U.K. Civil Aviation Authority (CAA) recently published a new report titled *U.K. Airmisses Involving Commercial Air Transport*. The report contains airmiss statistics for a 10-year period in U.K. airspace and includes details of the most recent airmiss investigations.

In the United kingdom, an airmiss is an incident that is said to have occurred "when a pilot considers that his aircraft may have been endangered by the proximity of another aircraft." It is said in the report that the U.K. system follows the guidelines set out by the International Civil Aviation Organization (ICAO). In practice, only pilots of aircraft involved in the incident can file an airmiss report. A decision to file an airmiss report rests entirely on the pilot's subjective assessment of the circumstances. However, pilots will normally report airmisses to air traffic controllers. If a controller believes that flight safety has been compromised, but no airmiss report was filed, the controller can file an aircraft proximity hazard report that will be investigated by a procedure similar to, but separate from, the airmiss reporting system.

All airmiss reports in U.K. airspace involving

Table 1
U.K. Total Airmisses (Civil and Military)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1990			1991	
											Jan. Apr.	May Aug.	Sep. Dec.	Jan Apr.	May Aug.
Definite Risk (A)	13	20	13	21	14	21	20	33	30	25	5	12	8	4	7
Possible Risk (B)	72	55	62	57	52	50	58	59	55	51	9	33	9	12	22
Total Risk-bearing (A+B)	**85**	**75**	**75**	**78**	**66**	**71**	**78**	**92**	**85**	**76**	**14**	**45**	**17**	**16**	**29**
No Risk (C)	131	96	92	93	77	104	113	120	118	119	25	61	33	19	29
Total (A+B+C)	216	171	167	171	143	175	191	212	203	195	39	106	50	35	58

Source: *U.K. Airmisses Involving Commercial Air Transport*, U.K. Civil Aviation Authority civil and military aircraft are investigated first by the Joint Airmiss Section of the National Air Traffic Services. Reports are examined by the Joint Airmiss Working Group, an independent committee drawn from a wide cross-section of civil and military agencies. In assessing the degree of risk in a reported airmiss (based on ICAO guidelines), the Working Group first determines if the incident has a "definite risk (A)," a "possible risk (B)" or "no risk (C)" of collision.

Table 2
Commercial Air Transport Aircraft Involved in Airmisses

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1990			1991	
											Jan. Apr.	May Aug.	Sep. Dec.	Jan Apr.	May Aug.
Definite Risk (A)	3	6	5	0	1	7	2	7	2	9	3	3	3	0	0
Possible Risk (B)	18	5	21	14	15	9	11	13	10	9	0	8	1	3	2
Total Risk-bearing (A+B)	**21**	**11**	**26**	**14**	**16**	**16**	**13**	**20**	**12**	**18**	**3**	**11**	**4**	**3**	**2**
No Risk (C)	74	50	48	60	44	59	57	75	60	58	11	28	19	11	12
Total (A+B+C)	95	61	74	74	60	75	70	95	72	76	14	39	23	14	14

Table 3
Commercial Air Transport Airmisses — Numbers of Incidents

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1990			1991	
											Jan. Apr.	May Aug.	Sep. Dec.	Jan Apr.	May Aug.
Definite Risk (A)	2	5	4	0	1	4	2	4	2	6	2	2	2	0	0
Possible Risk (B)	14	3	17	11	11	8	9	11	9	6	0	5	1	2	2
Total Risk-bearing (A+B)	**16**	**8**	**21**	**11**	**12**	**12**	**11**	**15**	**11**	**12**	**2**	**7**	**3**	**2**	**2**
No Risk (C)	58	39	38	51	37	49	44	58	51	51	9	27	15	9	8
Total (A+B+C)	74	47	59	62	49	61	55	73	62	63	11	34	18	11	10

Table 4
Airmisses Involving Two Commercial Air Transport Aircraft

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Definite Risk (A)	1	1	1	0	0	3	0	3	0	3	1
Possible Risk (B)	4	2	4	3	4	1	2	2	1	3	2
Total Risk-bearing (A+B)	**5**	**3**	**5**	**3**	**4**	**4**	**2**	**5**	**1**	**6**	**3**
No Risk (C)	16	11	10	9	7	10	13	17	9	7	9
Total Airmisses Involving Transport Aircraft (A+B+C)	21	14	15	12	11	14	15	22	10	13	12

*1991 figure is a ratio estimate based upon the January-August 1991 data in the report.

Source: *U.K. Airmisses Involving Commercial Air Transport*, U.K. Civil Aviation Authority

The Working Group investigation is not a disciplined procedure. Its purpose is to establish the cause of the airmiss to prevent a similar occurrence. However, where negligence was either a direct cause or a contributing factor, sanctions can be ordered against the pilots or controllers involved. The process of determining sanctions, however, is distinct from the airmiss reporting and investigation system. The chief inspector of accidents, who reports independently to the Secretary of State for Transportation, can initiate an accident investigation at any time when an airmiss is judged to be particularly serious.

Table 1 (page 7) is a summary of the number of airmisses reported in U.K. airspace during the the last 10 years with quarterly figures for the past two years up to May-August 1991. During the 10-year period, the annual number of airmisses fluctuated, but revealed a declining trend. Of the annual average (estimated at 184), about 70 incidents, or 42 percent, were considered to be risk-bearing and 58 percent had no risk.

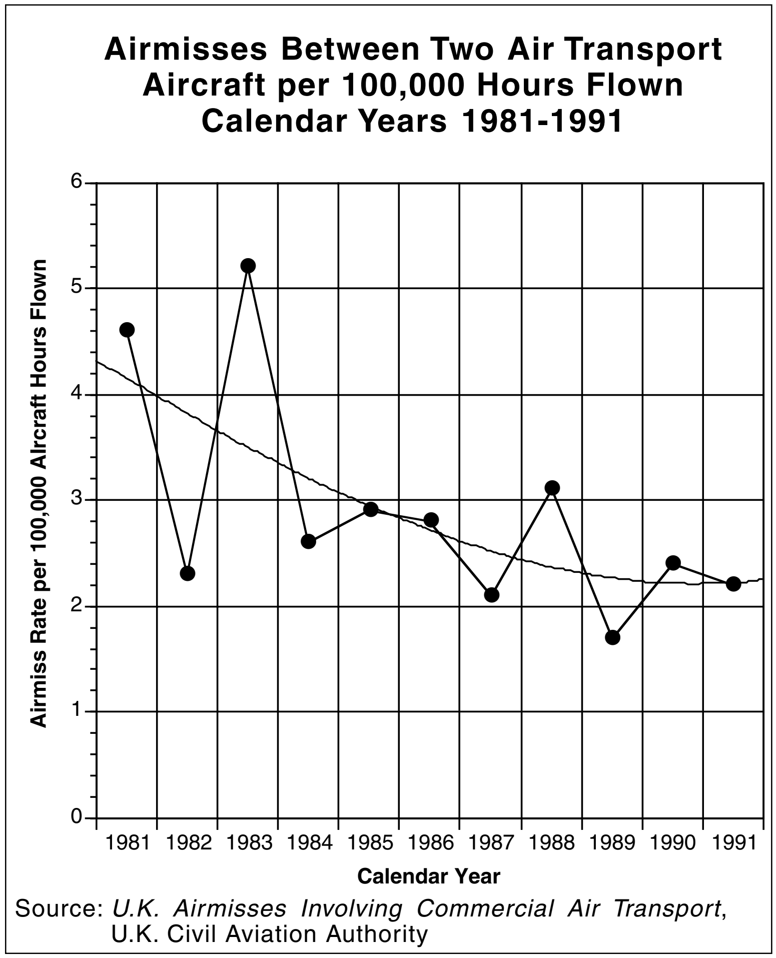

Figure 1

Two Airmisses per Month Involve Air Transport Aircraft

Airmisses can occur between any combination of commercial transport, military and general aviation aircraft. The public's concern is naturally focused on commercial passenger flight (Table 2, page 8). Table 3 (page 8) shows the number of airmisses involving commercial transport aircraft during the past 10 years. Table 4 (page 8) shows the actual number of commercial air transport aircraft involved in airmiss incidents involving two commercial transport aircraft generated from the difference between Tables 2 and 3. On average, an airmiss between two air transport aircraft could occur once a month.

Figure 1 shows the rate of commercial air transport aircraft involved in airmisses in terms of commercial transport aircraft

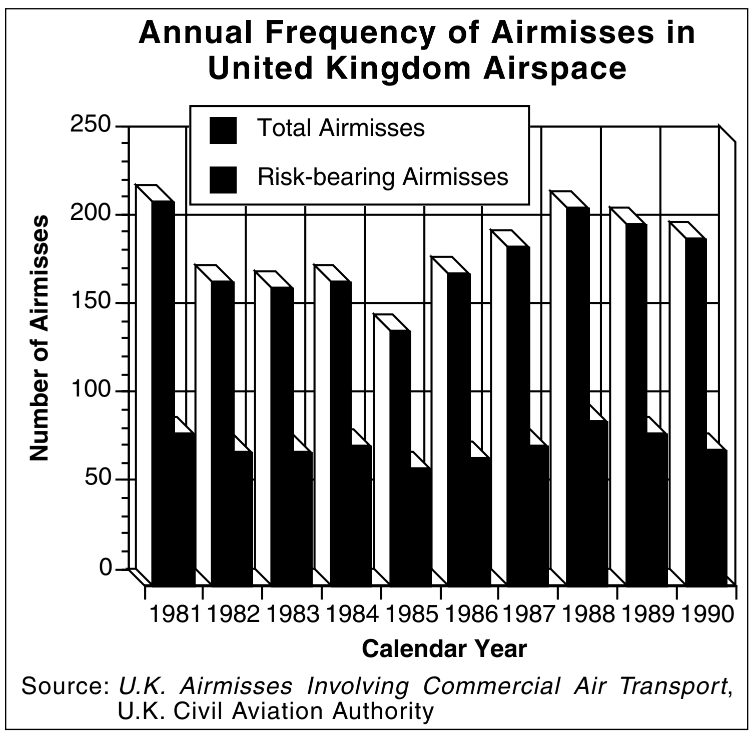

Figure 2

hours flown. The frequency of commercial air transport aircraft involved in risk-bearing airmisses during the 10-year period was about three airmisses per 100,000 aircraft hours flown. The 10-year trend has been falling, from 4.6 airmisses per 100,000 aircraft hours flown in 1981 to about two in 1990-1991. Figure 2 (page 9) shows the annual frequency of total airmisses as well as risk-bearing airmisses, including civil and military. It increases and decreases without a visible trend.

Copies of the report (No. ISSN 0951-6301) are available from the CAA's Printing & Publication Service at Greville House, 37 Gratton Road, Cheltenham, GL50 2BNB England. ♦

Reports Received at FSF Jerry Lederer Aviation Safety Library

Reference

Updated Reference Materials (Advisory Circulars, U.S. FAA)

Numbers	Month/Year	Subject
36-1F	June 1992	Noise Levels for U.S. Certified and Foreign Aircraft (Cancels AC 36-1E, Noise Levels for U.S. Certificated and Foreign Aircraft, dated June 30, 1988).
70/7460-1H	July 1992	Change 2 to Obstruction Marking and Lighting, AC 70/7460-1H, effective September 1, 1992).
150/5370-10A	July 1992	Change 4 to Standards for Specifying Construction of Airports, AC 150/5370-10A, effective July 7, 1992.
170-14	July 1992	Implementation of 50 kHz/Y Channels for ILS/VOR/DME (Cancels AC 170-12, Implementation of 50 kHz/Y Channels for ILS/VOR/DME, dated October 7, 1970).

New Reference Materials

Advisory Circular 120-56, 01/23/92, *Air Carrier Voluntary Disclosure Reporting Procedures.* Washington, D.C. U.S. Federal Aviation Administration, 1992. 12 p. in various paging.

Summary: This advisory circular (AC) provides information and guidance material that may be used by air carrier certificate holders operating under Federal Aviation Regulations (FAR) Parts 121 and 135 when electing to voluntarily disclose apparent violations to the Federal Aviation Administration (FAA). The procedures and practices outlined in this AC can be applied to maintenance, flight operations and security aspects of an air carrier's organization.

Advisory Circular 25.963-1, 07/29/92, *Fuel Tank Access Covers*. Washington, D.C. : U.S. Federal Aviation Administration, 1992. 2p.

Summary: This AC sets forth a means of compliance with the provisions of FAR Part 25 dealing with the certification requirements for fuel tank access covers on turbine powered transport category airplanes.

Reports

Comparisons of Molecular Sieve Oxygen Concentrators for Potential Medical Use Aboard Commercial Aircraft/Harvey M. England Jr.,

Bruce C. Wilcox Jr., Garnet A. McLean. Washington, D.C. U.S. Federal Aviation Administration, Office of Aviation Medicine; Springfield, Va., U.S. Available through the National Technical Information Service*, [1992]. Report No. DOT/FAA/AM-92/22. 7 p.: ill. Includes bibliographical references (p. 7).

Key words
1. Aircraft — Oxygen equipment — Evaluation.
2. Respirators — Evaluation.
3. Aircraft survival equipment — Evaluation.

Summary: Medically-impaired air travelers requiring supplemental oxygen must depend on airlines to provide oxygen cylinders. Performance, space and cost are considerations in providing this service. Tests were conducted in an altitude chamber to assess the viability of Molecular Sieve Oxygen Concentrators (MSOC) as an alternative. Five different MSOC were placed in the altitude chamber and connected to a mass spectrometer outside. Gas concentration was digitized at one sample per second and stored online via a microcomputer. Tests at ground level showed four of the five MSOC produced oxygen at 95 percent purity at two liters per minute flow, which was maintained until 13,000 feet. Increasing altitude resulted in graded reduction of oxygen levels. At 25,000 feet, only two MSOC withstood sudden decompression. Results of this study indicate that some MSOC indeed have the potential to provide oxygen for the medically-impaired air traveler. [Abstract]

Evaluation of Head Impact Kinematics for Passengers Seated Behind Interior Walls/Van Gowdy, Richard DeWeese (Civil Aeromedical Institute). Washington, D.C. U.S. Federal Aviation Administration, Office of Aviation Medicine; Springfield, Va., U.S. Available through the National Technical Information Service*, [1992]. Report No. DOT/FAA/AM-92/20. 12 p.: ill. Includes bibliographical references (p. 12).

Key words
1. Impact.
2. Head — Wounds and injuries.
3. Crash injuries.

Summary: Federal aviation regulations for crashworthy seats include the head injury criteria (HIC) as part of the pass-fail performance specifications. For passenger seats located behind interior walls to meet this requirement, the dynamics of head impact with the wall must be evaluated from a system approach. Procedures for conducting system tests and analyzing the head motion of an anthropomorphic test dummy (ATD) are described. Analyses of head kinematics from dynamic impact tests with a lap-belt restrained ATD are presented. [Abstract]

Aviation Research: FAA Could Enhance its Program to Meet Current and Future Challenges: Report to Congressional Requesters/United States General Accounting Office. Washington, D.C. U. S. General Accounting Office**, 1992]. Report No. GAO/RCED-92-180. 18 p.; ill. Includes bibliographical references.

Key words
1. Aeronautics — Safety measures — Research — United States.
2. United States — Federal Aviation Administration — Auditing.

Summary: This final report was given before the U.S. House of Representatives Committee on Science, Space and Technology as both a review of the Federal Aviation Administration's (FAA) research program and to assist in reviewing the FAA's fiscal year 1993 budget request. The report focuses on the FAA's progress in responding to the Aviation Safety Research Act of 1988; the long-term research that the FAA undertook in fiscal year 1991; and factors that will affect the FAA's success in meeting its research goals. The FAA's Research, Engineering and Development (RE&D) Program is acknowledged as playing an important role in ensuring the safety, security and efficiency of the U.S. air transport system. But, according to the report, the FAA has not included resource estimates for research efforts as required by the Aviation Safety Research Act nor has it delineated specific long-term projects in its RE&D plan. According to the report, Congress has been concerned that the FAA's RE&D program is not sufficiently future-oriented. The draft plan has established measurable goals, but the report says these goals are so ambitious that the plan cannot achieve them because they rely heavily on other FAA programs. According to the report, success in meeting research goals will depend upon incorporating RE&D goals into other programs; utilizing research conducted by other federal agencies; integrating various technologies to address existing and future capacity, security and safety concerns; and incorporating human factors into all research. [Modified Results in Brief]

Effects of Seating Configuration and Number of Type III Exits on Emergency Aircraft Evacuation/ Garnet A. McLean ... [et al.]. Washington, D.C., U.S. Federal Aviation Administration, Office of Aviation Medicine; Springfield, Va. Available through the National Technical Information Service*, [1992]. iii, 6, A-3 p.: ill. Includes bibliographical references (p. 6).

<u>Key Words</u>
1. Airplanes — Seats.
2. Aircraft survival equipment.
3. Survival.

Summary: An increase in the required pathway width from aircraft center aisles to type III overwing exits is being weighed by the FAA. To augment the analysis, an examination of seat/exit configuration effects on simulated emergency egress was constructed in the Civil Aeromedical Institute (CAMI) evacuation research facility. Four subject groups traversed four different seat/exit configurations in a counterbalanced, repeated-measures design. Pathway width was modified by altering seat pitch. In single-exit trials, the fastest times and highest flow-rate occurred with a 20-inch pathway between triple seats or a 10-inch pathway between double seats. Double exits produced 36 percent shorter egress times, although flow rates declined 11 percent and exit plug removal times increased 32 percent, compared to single exits. Efficient egress requires optimization of the spaces around the exit. Generally, wider pathways and fewer obstructions enhance this process. However, when available space exceeds individual passenger needs, conflicts may be produced that inhibit egress. [Modified Abstract]

Books

Winds of Change: Domestic Air Transport Since Deregulation. Washington, D.C. Transportation Research Board, National Research Council, 1991. x, 399 p. : ill. Special report 230. Includes bibliographical references.

<u>Key Words</u>
1. Airlines — United States — Deregulation.
2. Aeronautics, Commercial — United States.
3. Aeronautics and state — United States.

Summary: A decade after passage of the Airline Deregulation Act of 1978, the Executive Committee of the Transportation Research Board (TRB) concluded that a review was needed of the experience with airline deregulation. Late in 1988 the governing board of the National Research Council (NRC) and others sponsored a committee appointed by the NRC to investigate the effects of deregulation upon the airline industry. This committee, composed of experts in aviation, economics, safety, airline and airport operation, and public policy, was asked to consider whether the level of air passenger service is adequate in comparison with past and likely future trends; whether there are certain factors, working independently or interactively, that affect service; whether safety has diminished since deregulation; and whether policy changes by airlines, local agencies that own and operate airports, or the federal government, are necessary to improve the quality of air passenger service. The committee defined the key issues affecting commercial aviation since deregulation, examined the effects of deregulation on the industry and the response to deregulation from both the public and private sectors. The first part of the committee's report focuses on private sector issues; namely, air carrier management and financing, effects on consumers (in terms of fares and flight frequency) and the nature of airline competition. The second part of the report deals with issues affecting the public sector, such as safety, airport and airway capacity and the ability of the federal government to discharge its responsibilities in these areas. In its examination of the government role since deregulation, the committee focused most of its attention on the role of the FAA in providing airway and airport capacity and enforcing federal safety regulations. Conclusions and recommendations are given in a summary and four appendices are provided, including a dissenting statement from a member of the study committee.[Modified Preface and Executive Summary] ♦

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Accident/Incident Briefs

This information is intended to provide an awareness of problem areas through which such occurrences may be prevented in the future. Accident/incident briefs are based upon preliminary information from government agencies, aviation organizations, press information and other sources. This information may not be entirely accurate.

Boeing 747 Wake Turbulence Thrashes Fokker

Fokker F27-200 Friendship. No damage. One serious injury.

The Fokker was cleared to descend to 8,000 feet for initial positioning for London's Heathrow International Airport. Immediately preceding the F27 was a Boeing 747 descending to 4,000 feet, also cleared to land on runway 09L.

A short time later, the F27 was re-cleared to 4,000 feet and the 747 was told to line up for runway 09R. Runway 09R, the usual runway for takeoffs, is sometimes allocated as a convenience to inbound aircraft heading for Terminal 4. This meant that the F27 would pass behind the 747 while positioning for runway 09L.

Subsequently, both aircraft were cleared to descend to 3,000 feet and were separated horizontally by eight nautical miles. A minute later, the F27 was cleared to descend to 2,500 feet and the separation was reduced to 4.5 nautical miles. After another minute had elapsed, when the F27 crossed the 09R centerline, the horizontal separation was about three nautical miles. The F27 encountered the wake vortex of the

B-747 about 500 feet below the height at which the 747 had been one and one half minute earlier.

The wake turbulence, which lasted only a few seconds, threw the No. 2 flight attendant out of her jump seat and into the air but she landed back on the seat. The No. 1 flight attendant, who was closing the flight deck door, was thrown into the air and broke her leg when she landed and fell, spending the rest of the flight on the floor in considerable pain until the aircraft landed about two minutes later.

Air traffic regulations for Heathrow require allowing a minimum wake turbulence separation of five miles for crossing traffic and six miles for following traffic.

Four Engines Flameout Over West Australian Desert

British Aerospace BAe-146. No damage. No injuries.

While cruising at Flight Level 310 (31,000 feet) on a scheduled flight to Perth, the BAe-146 lost power on all four engines. The aircraft, with 51 passengers and a crew of four aboard, descended to 10,000 feet before the crew was able to restart the engines and restore power.

The aircraft diverted to a nearby airport along the flight route.

A post-crash inquiry determined that the likely cause of the flameouts was icing. The Australian Bureau of Air Safety has imposed an altitude limit for the aircraft of FL280 in clear weather and FL250 in icing conditions.

Helicopter Causes Near Miss On Short Final

Boeing 737. No damage. No injuries.

The Boeing 737 was on a radar-controlled approach to Romania's Bucharest Airport. As the passenger jet broke out of cloud at 400 feet above the runway, the flight crew saw a helicopter maneuvering at the same altitude about 200 feet from the runway centerline. The helicopter did not change its position and air traffic control made no mention of its presence.

The flight crew reported that the time lapse between sighting and passing the helicopter was about two seconds.

Trim Loss Brings Down Metro II

Swearingen Metro II. Aircraft destroyed. Four fatalities.

The Metro II accelerated normally on the takeoff run and the gear was retracted after liftoff.

A few seconds after liftoff, the aircraft was observed to descend and it subsequently collided with the ground and caught fire. The two pilots and two passengers were killed.

An investigation determined that loss of trim may have been caused by a sudden activation of the stick pusher, although lack of flight recorders and total destruction of the stall avoidance system precluded confirmation of the hypothesis. The inquiry concluded that lack of visual cues during the night takeoff also contributed significantly to the crash.

Engine Fire Leads to Emergency Landing

British Aerospace BAe ATP. Substantial damage. Two minor injuries.

At 3,000 feet in a routine daylight descent, the pilot smelled a burning odor that was followed by light smoke in the cockpit. The smoke became more dense at 2,000 feet and entered the cabin, which was filled with 54 passengers.

The pilot initiated an emergency descent. At 200 feet above ground level, the No. 1 engine torque reading was zero. The pilot made a high approach and the aircraft touched down halfway down the runway, left the runway but was brought back into control and onto the runway. The pilot activated fire extinguishers on both engines before shutdown and all passengers were evacuated safely.

An investigation determined substantial damage to the No. 1 engine, with broken metal pieces of the turbine section in the exhaust pipe. There was a heavy oil splash on the left engine nacelle and wing under surface. A low quantity of oil was found in the left engine oil tank.

Corporate Executive

Electrical Failure Adds Drama to Instrument Approach

Beech 80 Queen Air. Substantial damage. No injuries.

The Queen Air lost all electrical power while in daylight instrument visual conditions. The pilot descended immediately to visual meteorological conditions.

During the emergency descent, the gear could not be lowered. The aircraft was force-landed in a field and slid into a stone wall, tearing the right engine off before stopping.

An investigation determined that a broken electrical wire on a cannon plug at the right engine firewall had short circuited.

Pilot Crashes in Unfamiliar Aircraft

Cessna 421. Aircraft destroyed. One fatality.

The newly-hired pilot, who held a commercial certificate, began a familiarization flight in the 421 although he had not been flight checked in the aircraft.

The right engine failure was caused by fuel starvation. The left engine failure was caused by fuel starvation when the aircraft was about 10 miles from its home airport.

The aircraft crashed into a pasture in a nose down, slightly left wing low, vertical descent angle. A fuel line ruptured on impact and caused a fire that engulfed the left engine, cabin and left wing. A post-crash inquiry determined that neither propeller was feathered at impact and that the gear was lowered. The flaps were fully extended.

Other General Aviation

Power Lines Botch Landing After Engine Power Loss

Piper J3. Aircraft destroyed. One serious injury.

During an emergency landing after the Piper's engine lost power, the J3's tailwheel struck wires at a height of about 25 feet above a field. The aircraft pitched nose-down into the ground. A passenger was seriously injured.

An inquiry determined that the pilot initiated the emergency landing even though he was aware that wires were located at the approach end of the field. The engine was still developing some power at impact and the fuel tank ruptured. Engine power loss was attributed to a vapor lock.

No-flap Takeoff Kills Four

Socata TB10 Tobago. Aircraft destroyed. Four fatalities.

Witnesses said that during the take-off roll, the single-engine TB10 failed to gain sufficient altitude as it departed a steeply sloping grass strip.

The aircraft struck obstacles at the end of the airstrip, cartwheeled and caught fire. The pilot, who had 1,372 hours total time, was killed along with three passengers.

An investigation determined that the flaps were retracted at impact. The was no evidence of engine malfunction or a medical condition of the pilot that could have contributed to the accident.

Rotorcraft

Air Ambulance Mission Ends With Mountain Crash

Aérospatiale AS-350D. Aircraft destroyed. Two fatalities. One serious injury.

The helicopter was en route to pick up a patient when it crashed into mountainous terrain.

A surviving crew member reported that the flight was normal until about one minute before the crash when suddenly "everything got dark" and he could not see horizontally outside the aircraft and could no longer see lights on the ground. The crew member, a paramedic, said the pilot had checked the weather before departing and had said that the ceiling was at 8,000 feet above ground level (AGL).

The paramedic said that he was trying to see through the forward windscreen until about 30 seconds prior to impact, when he heard the radar altimeter audio warning sound. He said he did not see any warning lights in the cockpit and added that the pilot did not perform any "big" maneuvers prior to impact.

A company visual flight rules (VFR) flight plan was filed for the operation. Instrument meteorological conditions prevailed at the accident site.

Food Poisoning Cuts Short Air Taxi Flight

Bell 206L-3. Aircraft destroyed. Two fatalities. Two serious injuries. One minor injury.

The commercial pilot and four passengers were en route to an offshore platform when the pilot suddenly became ill shortly after takeoff.

About four minutes into the flight, the pilot radioed that he was returning to base, adding that he was not feeling well. About a minute later the pilot radioed that he was "going to land on the water at coordinates 29.15 and 89 ... ." Before he finished the last two digits he said "Hell, I don't know."

Two passengers were killed when the helicopter struck the water. The pilot and another passenger were seriously injured.

The pilot stated that there was no evidence of aircraft malfunction. He said he began to experience severe nausea, dizziness and heavy sweating after takeoff, which he blamed on fried fish he had eaten the day before.

According to the pilot, he became ill at an altitude of 800 feet mean sea level (MSL) and intended to start an approach to the water.

He said his last recollection of the flight was when he moved the collective control down to start the approach. The next thing the pilot remembered was being picked up by a rescue helicopter.

Two passengers seated in the cabin stated that the pilot did not warn them of a possible water landing. They said the approach looked normal until the nose pitched down to near-vertical just before impact. ♦