Terrorism — Dark Times Ahead?

The Middle East War has ended, but violent forces allied with Saddam Hussein may remain a threat to the safety of air transportation.

by
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Almost a year ago, it was extremely quiet on the terrorist front. Hardly anyone predicted the sudden attention this subject was about to receive only a few months later.

Last spring, the inquest into the bombing of Pan Am Flight 103 over Lockerbie, Scotland, was still in the news, but did not make headlines anymore; the downing of a U.T.A. (Union de Transports Aeriens) airliner over Niger in 1989 seemed forgotten by the media; and the bomb that destroyed an Avianca plane near Bogota, Columbia in 1989 was but one atrocity in the Medellin cocaine cartel's violent war against the Columbian state. However, those quiet days have passed, and it is appropriate to consider a general assessment of the present terrorist situation in order to consider what kind of threat civil aviation can expect within the near future.

It is important to establish that the present situation is very dangerous indeed, not only because we are in the aftermath of a war, but first and foremost because of the violent nature and past behavior of Iraq's president, Saddam Hussein, the unpredictable kingpin of the catastrophe that unfolded during the past several months. Many things have been said about Hussein, but relatively few words have been spared about his knack for violence and conspiracy. Talking about that too loudly in the past decade would have been somewhat embarrassing for all those who actually knew what kind of person he was, but who nevertheless tolerated, and even supported him, for political and economical reasons. Many western governments, including the U.S. government, played down the violent acts of the Iraqi leader for quite some time, in the erroneous assumption that an enemy of their [western government] enemy had to be its friend.

So the West forgave and even silently applauded Hussein's assault on Iran, and subsequently felt obliged to provide him with the necessary military hardware to wage his eight-year-war with the ayatollahs in Teheran. In 1982, the U.S. government thought it was appropriate to strike Iraq off its list of terrorist sponsoring countries as a reward for Hussein's shrewd decision to remove the welcome mat for some of his oldest and most bloodthirsty guests and protegés, Abu Nidal and his Fatah Revolutionary Council, who were becoming an obstacle for profitable relations with the west. They were not arrested, but asked to leave Iraq [for Libya].

The use of chemical warfare, first against the Iranians and later against Iraq's own Kurdish population, was the first major crime that caused some western doubt about Hussein. The super-cannon affair [during which Iraq tried to

import specially designed pipes that were to become cannon barrels] and Iraqi efforts to get detonators for nuclear devices also made the headlines.

Hussein's past is riddled by killings, summary executions and public hangings — in fact, on several occasions he pulled the trigger himself. From 1968, which was the year his party took power, until 1979, Hussein as vice-president, was the architect of the Iraqi secret services, which he organized to great perfection and which apparently remain completely loyal to him. His conspiratorial skills changed Iraq into a society in which about 30 percent of the population informs and spies on the rest.

After he overthrew former president Ahmad Hasan al Bakr in 1979, Hussein took the presidency himself, becoming one of the very few, if not the only one, who dedicated his presidential task entirely to aggressive warfare. In 1980, he attacked Iran and waged war for eight years and later, made several attacks on his own Kurdish population. In 1990, he invaded Kuwait, an act of aggression that led to the recently ended war with several allied nations, that sought to enforce United Nation's sanctions. Whatever the reasons for his dangerous behavior — territorial, nationalist, personal — his political career has excelled in the use of violence on a national and on an international level, and not as a victim but as the orchestrator.

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Hussein is an able politician, at least in the framework of the Middle East. His claim that the annexation of Kuwait would bring closer a solution to the Palestine problem of self-determination garnered support, so much so that even the Palestine Liberation Organization (PLO) took his side in the conflict. The world has still to discover if Hussein's second claim, that he waged a religious war of Jihad against the infidels, will meet with success; there were signs of Moslem approval in other countries for this religious motive.

Unfortunately, both of these claims appealed to terrorist forces, as an effort to create some sort of an invisible, worldwide second front. This front did not win the war for him, but it certainly has created uneasiness among Hussein's adversaries.

This appeal to terrorist help is in accordance with Hussein's personality. He succeeded quite well in intimidating his own population, so why not try the same weapon of intimidation on his enemies abroad? It is possible that he has great expectation about its effects, and it has to be admitted that so far he has no reason to feel greatly disappointed.

Early in December 1990, the 12 European Community (EC) home affairs ministers gathered in Rome for a meeting of the so-called Trevi group, the international governmental security body we hear little about. This time, the public was merely informed of the concern expressed by minister-members about developments of the Middle East conflict, and about the possibility of terrorist acts in the event of a military showdown in the Persian Gulf region. The group even decided to call for a meeting of its anti-terrorist experts at an earlier date, in January 1991, instead of March as previously scheduled, in order to prepare for danger as soon as possible.

This seemed to be a good idea, assuming that the Iraqi dictator would unleash the agents of terrorist war he had assembled in Baghdad in 1990 in the event of a military conflict between Iraq and the West. Time seemed available to prepare effective countermeasures. But on the other hand, it was highly probable in those days of December that Hussein's fifth terrorist column was already in the field, and that the Trevi initiative had come too late. There were two reasons for this assumption. The first was that once war had started, it would become very difficult for terrorist agents to leave Iraqi territory for assigned targets in other

countries, surrounded as Iraq was by enemies on almost any side, with Turkey on the north, Iran on the east, Syria on the west and Saudi Arabia on the south. Only Jordan offered a possible way out in that circumstance, a shaky ally at the time.

The second reason had to do with military effectiveness. Hussein had spent much money to acquire such an impressive force of underworld terrorists, and he had been expected to use them as a means of retaliation as soon as he was attacked. Because terrorist groups need preparation time for their actions, this would also imply that methods and targets had already been selected.

Therefore, it appeared crucial for the groups that back Hussein to get their active commandos out of his country well before war started, and to station them in the vicinity of the targets chosen to be attacked. These groups, by the way, can be trusted to find their way into Middle Eastern and European countries, because they had been there before. In the past, they spent time building networks of reliable moles and sleepers there, who can be activated relatively easily.

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Last year's marriage between Hussein's regime and the Palestinian terrorist groups was one of mutual convenience. It may now be assumed that Hussein's ambition to invade Kuwait ripened in 1989, immediately after the end of his disappointing war with Iran that denied him victory and substantial territorial gains. As a shrewd dictator, he must have guessed that an attack on Kuwait would leave him with few Western and Middle Eastern friends, although he must have been also taken by surprise by the widespread rejection of his enterprise. The support of terrorist groups balanced his isolated position somewhat.

The terrorist groups must have been pleased with Saddam's invitation to join forces with him, because of the decreasing market for terrorist actions. With Iran trying to gain more international legitimacy, Syria's president Hafez Al Assad posing as a responsible statesman and Libya's Col. Mu'ammar al-Qadhafi in one of his less deranged periods, the demand for terrorist mercenaries was deteriorating, so the call to arms from Baghdad was most welcome.

One of the first groups to accept Hussein's invitation was the Fatah Revolutionary Council, led by the notorious Sabri Al Banna, alias Abu Nidal, who made quite a name for himself as the most ruthless terrorist to fight for the liberation of Palestine and his own financial benefit. He and his group were responsible for a series of atrocities, including the airport massacres at Rome and Vienna in December 1985; the massacre at the synagogue in Istanbul in 1986; and the hijacking of an Egyptian plane in the same year, also with heavy losses of life. Before that time, Abu Nidal specialized in targeting and killing moderate PLO officials, a tactic he used again in 1982 when his group made an attempt on the life of the Israeli ambassador in London, thus provoking the Israeli invasion of Lebanon

Abu Nidal's group, or what was left of it, was in fact saved from collapse by Hussein's invitation. In November 1989, two of Abu Nidal's closest aides, Atef Abu Bakr and Abdel Rahman Issa, had had enough of their leader and announced they and a rebel faction wanted a renewed alliance with Arafat's PLO. The reason for their desertion, as they told it, was the bloodthirstiness of their former leader, who according to them was "a perfect example of schizophrenia" and, who in an act of folly had more than 150 of his followers killed as Israeli spies. Even Qadhafi had shown his displeasure about this massacre, by taking Abu Nidal into custody and ordering his group to get out of Libya.

The whereabouts of Abu Nidal became unclear for a while. One source said that he was under Libyan house arrest, another located him in an Algerian hospital with terminal can-

cer, another source reported him dead and a fourth revealed that in April 1990 Abu Nidal had offered his services to Hussein. His troubles, however, were not over yet, because in June 1990, Arafat's PLO launched an attack on one of Abu Nidal's camps in the Lebanese Bekaa valley, and took some 40 of his followers prisoner.

With the remains of this group, Abu Nidal changed employers and moved from Libya to Baghdad, somewhere during May and June 1990. However, he did not break off relations with the Libyan leader. In fact, in January 1991 he did Qadhafi one more favor by setting free some Belgian hostages he had kept for several years, probably in an attempt to facilitate Libyan commercial relations with a Western country like Belgium. Belgium reciprocated Abu Nidal's kind gesture the same month, by not arresting Walid Khaled, one of Abu Nidal's henchmen, but by giving him the opportunity to leave Belgian territory without delay. And he pleased his new employer, Hussein, by having the PLO's number two man, Abu Iyad, murdered just two days before the military conflict started.

"... at this moment our fingers are touching the trigger. We will shoot the moment Iraq suffers aggression."

Abu Nidal's organization may be the most fearsome terrorist group at present, but in the late 1960s and early 1970s the most notorious group was the Popular Front for the Liberation of Palestine (PFLP), led by George Habash. While Arafat's Fatah movement engaged in guerrilla warfare against Israel during those days, the Marxist-Leninist Habash decided that more countries were to blame for Palestinian misery, especially the capitalist countries that sustained the Jewish state. In fact, Habash introduced Palestinian terrorism in western Europe by hijacking planes, bombing synagogues and attacking air terminals. Together with the Japanese Red Army, Habash's PFLP was responsible, on May 30, 1972, for the attack on Lod Airport in Tel Aviv, Israel, which resulted in the death of 25 people and the wounding of approximately 75 more.

Habash's organization and its pro-Soviet offspring, the Democratic Front for the Liberation of Palestine (DFLP) of Nayef Hawatmeh, continued their terrorist activities during the 1970s, after which they quieted down. In 1986, they made peace with Yasser Arafat and rejoined the PLO, which then announced that henceforth it would renounce terrorism as a means of fighting for a Palestinian state. Nevertheless, during a conference in Amman in September 1990, Habash and Hawatmeh opted for the Iraqi side in the Gulf conflict and promised to retaliate against any "imperialist-zionist" threat. Habash was quoted "at this moment our fingers are touching the trigger. We will shoot the moment Iraq suffers aggression. War has its own logic. We are not terrorists. We are freedom fighters."

It did not seem to bother Habash that he was siding with a regime that, according to his own point of view, had committed the same crime against the Kuwaitis as he accused Israel of doing in 1948 against the Palestinians, by forcibly denying a people the right of independence. Habash turned the argument upside down, by asking why Iraq should withdraw from Kuwait if Israel had not been forced to withdraw from the occupied territories.

Threatening remarks were also made by Abu Abbas, leader of the Palestine Liberation Front, which in 1985 made news headlines with the hijack of the Achille Lauro cruise ship, and in May 1990 torpedoed the United States-PLO dialogue by trying to invade a Tel Aviv beach using heavily armed personnel aboard speedboats. Two other groups, supposedly in Baghdad since August 1990, are Abu Salim's Popular Front for the Liberation of Palestine, Special Command, and the 15th of May group of Abu Ibrahim, a man known for his successful aircraft bombs during the 1970s. Another group, that according to rumors has moved to Baghdad, is Ahmed Jibril's Popular Front for the Liberation of Palestine-General Command, the primary suspect in the Lockerbie bombing.

The groups mentioned above are dangerous; they have proven that in the past. An additional danger has been Yassir Arafat's decision, just before the war started, for the PLO to take the Iraqi side. Why he made this apparently desperate move is not known. Perhaps he considered it his duty to follow the more radical factions of PFLP, DFLP and PLF; perhaps he was forced by his own Fatah followers to take a belligerent stand. Eventually, the move will cost him, politically and financially. But in the meantime, no one knows what to expect from all the PLO offices in so many countries, or from Palestinian immigrants worldwide or from the way the intifadah (the Palestinian uprising against the Israelis) might develop in the occupied territories.

All Palestinians, as far as they recognize the PLO as their representative organization, aligned with Hussein, and the consequences of this alliance could be dreaded. Another dangerous aspect is Hussein's effort to build an image as a holy warrior. If taken at face value, this could incite certain Moslem groups, like Hezbollah and Jihad Islami in Lebanon to join the terrorist force of Iraq, even in the aftermath of the war.

Civil aviation has remained a favorite target for Middle East terrorist groups ... .

It is still unclear what all this means for civil aviation. However, the point to consider is that Hussein has surrounded himself with professional terrorists, some known because of their hijackings, aircraft bombings and attacks on airports in the past. In times past, these groups, although linked to some supportive regime, stressed the autonomy of their actions and claimed to be independent in their decision-making. Now, however, are they firmly embedded in Hussein's strategy to act as auxiliary forces?

Civil aviation has remained a favorite target for Middle East terrorist groups, and the reasons for it are still the same: high visibility, which means extensive coverage of any terrorist act by the news media, and the fear instilled into the traveling public just by threats of terrorist acts. The influence of fear has been dramatically demonstrated during the past several months, when corporations and individuals cancelled air travel because of potential terrorist attacks. Coupled with the world's generally poor economic conditions, made worse by high fuel costs during the past year, empty seats added to lost revenue. The effect on the airline industry has been devastating and echoed into other industries as well.

Hijacking, out of fashion for some years now, may become attractive again, as a tool to free prisoners of war, to coerce minor economic or territorial concessions, or to simply ridicule the coalition forces.

The hijacking of aircraft has been rendered more difficult in Western countries, but with Iraqi sympathizers within their borders, perhaps some of these difficulties might be overcome, like the smuggling of weapons aboard a plane. Outside the Western Hemisphere, the possibilities of getting an armed commando on board an aircraft are more likely because many people back Hussein, regardless of their governments' positions.

Hijacking is the least lethal way to attack an airline. Far more dangerous, are the use of bombs on aircraft and armed attacks on air terminals. Semtex, the favored terrorist explosive, has found its way to the Middle East by the ton, and detection technology, which has been developed to cope with this odorless and malleable explosive, is still imperfectly applied and distributed.

There has been evidence that some terrorist commandos are already on the move. In December 1990, two units were arrested in Spain, while in Italy an Iraqi was arrested on suspicion of terrorist activities. In January 1991, the Austrian security service arrested a group of Iranian terrorists belonging to the Majahedian el Khalk, the Iranian communist party which, out of revenge, sided with Iraq. In Yugosla-

via, the Serbian government was accused of letting some 50 terrorists cross through the country into Western Europe; the accusation was never denied.

In this regard, it is an open question whether the United States, too, has been infiltrated by middle eastern terrorists. Experts have long expressed their amazement why it was that the United States, which in the view of so many Moslems personifies the Great Satan himself, has hardly been bothered by terrorist attacks. The explanations have not always been convincing, like the one that took for granted that it was the uniform outer frontier that protected the United States against terrorist infiltration, while in Europe a chaos of national borders facilitated easy entry.

It is difficult to understand why it would be difficult for terrorists to enter the United States, when tens of thousands of Latin Americans have already succeeded in illegally crossing the southern U.S. border.

I always suspected that the United States was spared terrorist visits because of Soviet influence on radical Middle Eastern countries and their terrorist protegés, assuming that it has never been in the interest of the Soviet Union to heighten East-West tensions unnecessarily. If this theory has had any value, then now could be the time for terrorists to test it, because the Soviet Union has lost its grip on the Middle Eastern radicals, and this could mean that U.S. territory is no longer off-limits. ♦

About the Author

C.J. Visser studied modern history at the University of Amsterdam during the 1960s. He was a researcher at the Netherlands Institute of Questions on Peace and Security, The Hague, from 1970 to 1983. Since then, he has been a member of the research department of the Netherlands Institute of International Relations Clingendael, The Hague, where he has written books and articles about terrorism.

A recognized authority on the subject of terrorism, Visser has studied the Basque separatist group ETA and the Italian Red Brigades, as well as terrorist groups in Latin America and the Middle East. He has spoken and written for the Flight Safety Foundation and is the author of the FSF pamphlet "Civil Aviation Remains Vulnerable to Terrorism."

Aviation Statistics

U.S. Air Carrier Safety Performance Accident Statistics and Trends 1980-1990

In 1990, U.S. scheduled and nonscheduled airlines operating under 14 CFR 121, large certificated route air carriers and supplemental air carriers, were involved in 26 accidents, six of which resulted in 39 fatalities. Twelve of the fatalities were crew members and passengers aboard the aircraft involved, according to preliminary statistics released by the U.S. National Transportation Safety Board (NTSB). A brief description of the six fatal accidents is

shown in Appendix 1.

Tables 1 and 2 list the number of accidents, fatal accidents and rates of U.S. air carriers by scheduled and nonscheduled service for the past decade. In nonscheduled services, there were only two accidents, neither of which was fatal. The total accident rate of nonscheduled services measured by all three major safety yardsticks, i.e., aircraft hours flown, aircraft miles flown and departures, is the second lowest in the decade. In scheduled service, U.S. air carriers were involved in 24 accidents, the lowest number since 1987. Although six of the 24 were fatal, only eight passengers and four crew members aboard three aircraft involved in the six fatal accidents were fatally injured. The total 29 fatalities in 1990 and the total accident rates for 1990 were also the lowest since 1987.

In view of the fact that the total accidents, fatal accidents, fatalities and accident rates have been declining since 1987, the monthly accident data and aircraft hours flown over the

Table 1

Accidents, Fatalities, and Rates
U.S. Air Carriers Operating Under 14 CFR 121
Scheduled Service (Airlines *)
1980-1990

	Accidents		Fatalities					Accident Rates@ Per Million Aircraft Miles		Per 100,000 Aircraft Hours		Per 100,000 Departures	
Year	Total	Fatal	Total	Aboard	Aircraft Miles Flown#	Aircraft Hours Flown#	Departures*	Total	Fatal	Total	Fatal	Total	Fatal
1980	15	0	0	0	2,928,955,000	7,069,481	5,567,044	0.0051	0.0000	0.212	0.000	0.269	0.000
1981	25	4	4	2	2,811,348,000	6,834,140	5,420,342	0.0089	0.0014	0.366	0.059	0.461	0.074
1982	16	4	234	222	2,806,885,000	6,697,770	5,162,346	0.0053	0.0011	0.224	0.045	0.291	0.058
1983	22	4	15	14	2,920,909,000	6,914,969	5,235,262	0.0075	0.0014	0.318	0.058	0.420	0.076
1984	13	1	4	4	3,258,910,000	7,736,037	5,666,076	0.0040	0.0003	0.168	0.013	0.229	0.018
1985	17	4	197	196	3,452,753,000	8,265,332	6,068,893	0.0049	0.0012	0.206	0.048	0.280	0.066
1986	21	2	5	4	3,875,523,358	9,498,519	6,954,833	0.0052	0.0003	0.211	0.011	0.288	0.014
1987	32	4	231	229	4,111,723,029	10,064,852	7,251,288	0.0075	0.0007	0.308	0.030	0.428	0.041
1988	28	3	285	274	4,259,991,158	10,520,090	7,255,417	0.0063	0.0005	0.257	0.019	0.372	0.028
1989	25	8	131	130	4,336,549,023	10,583,726	7,258,677	0.0058	0.0018	0.236	0.076	0.344	0.110
1990P	24	6	39	12	4,382,000,000	10,800,000	7,259,000	0.0055	0.0014	0.222	0.056	0.331	0.083

P Preliminary data.

* Includes accidents involving deregulated all cargo air carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121 operations.

\# Source of estimate: FAA.

@ The following suicide/sabotage cases are included in "Accidents" and "Fatalities" but not in "Accident Rates":

			Fatalities	
Date	Location	Operator	Total	Aboard
8/11/82	Honolulu, HI, U.S.	Pan American	1	1
4/02/86	Near Athens, Greece	Trans World	4	4
12/07/87	San Luis Obispo, CA, U.S.	Pacific Southwest	43	43
12/21/88	Lockerbie, Scotland	Pan American	270	259

Table 2

Accidents, Fatalities, and Rates
U.S. Air Carriers Operating Under 14 CFR 121
Nonscheduled Service (Airlines *)
198 -1990

								Accident Rates					
								Per Million Aircraft Miles		Per 100,000 Aircraft Hours		Per 100,000 Departures	
	Accidents		Fatalities		Aircraft	Aircraft							
Year	Total	Fatal	Total	Aboard	Miles Flown#	Hours Flown#	Departures*	Total	Fatal	Total	Fatal	Total	Fatal
1980	4	1	1	0	114,867,000	310,100	162,364	0.0348	0.0087	1.290	0.322	2.464	0.616
1981	1	0	0	0	109,449,000	291,558	154,537	0.0091	0.0000	0.343	0.000	0.647	0.000
1982	4	1	1	1	131,628,000	342,555	188,787	0.0304	0.0076	1.168	0.292	2.119	0.530
1983	2	0	0	0	148,409,000	383,830	209,112	0.0135	0.0000	0.521	0.000	0.956	0.000
1984	4	0	0	0	169,153,000	429,087	232,776	0.0236	0.0000	0.932	0.000	1.718	0.000
1985	5	3	329	329	178,264,000	444,562	237,866	0.0280	0.0168	1.125	0.675	2.102	1.261
1986	3	1	3	3	187,728,057	475,353	271,473	0.0160	0.0053	0.631	0.210	1.105	0.368
1987	4	1	1	1	233,399,828	523,844	306,947	0.0171	0.0043	0.764	0.191	1.303	0.326
1988	1	0	0	0	243,563,710	621,441	366,948	0.0041	0.0000	0.161	0.000	0.273	0.000
1989	5	3	147	146	266,187,646	667,353	382,124	0.0188	0.0113	0.749	0.450	1.308	0.785
1990P	2	0	0	0	267,000,000	670,000	383,000	0.0075	0.0000	0.299	0.000	0.522	0.000

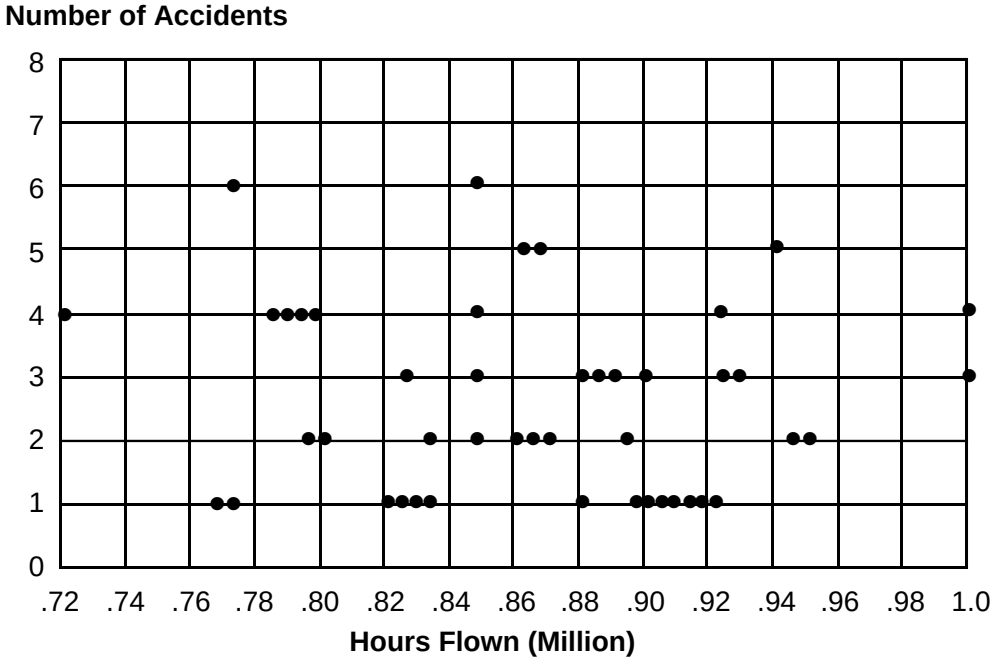
P Preliminary data.

* Includes accidents involving deregulated all cargo air carriers and commercial operators of large aircraft when those accidents occurred during 14 CFR 121 operations.

\# Source of estimate: FAA.

Figure 1

A Scatter Diagram of Accidents and Hours Flown per Month
U.S. Air Carriers Operating Under 14 CFR 14 (Airlines)
Scheduled and Nonscheduled Service 1987-1990



A total of 120 accidents were recorded over the four year period. No accidents were recorded in January 1987 and November 1990.

four-year period were used to evaluate whether aircraft accidents and flight time are correlated. Figure 1 is a scatter diagram of accident frequency and aircraft hours flown by month for the four-year period. It is apparent that no clear relation between accident frequency and aircraft hours flown can be drawn.

Figure 2 illustrates the total accident and fatal accident rates from 1980 to 1990 and Figure 3 shows the monthly accident rates in terms of aircraft hours for every year. In terms of both total and fatal accidents, and rates, there were no discernable trends of any consequence. The three figures clearly depict that as far as U.S. air carriers are concerned, in the past decade the occurrence of aircraft accidents is a random event, and that their accident involvement, either on a monthly basis or an annual basis, is independent from the increase or decrease of aircraft flight time.

Figure 2

Accident Rates and Trends
U.S. Air Carrier — All Operations
1980-1990

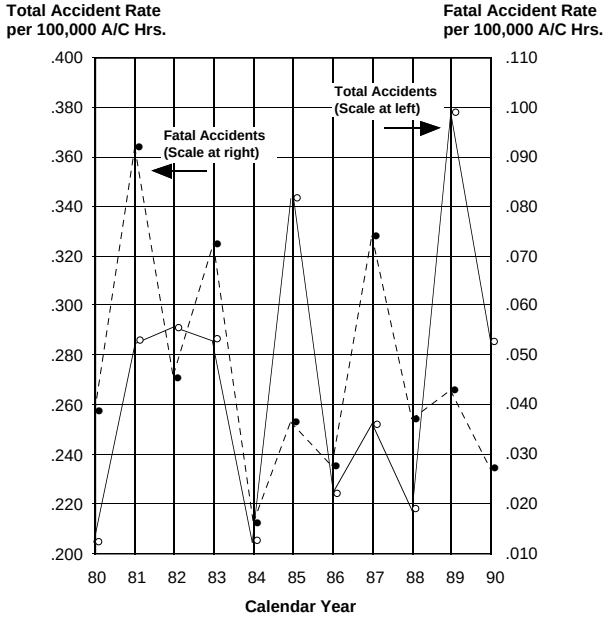
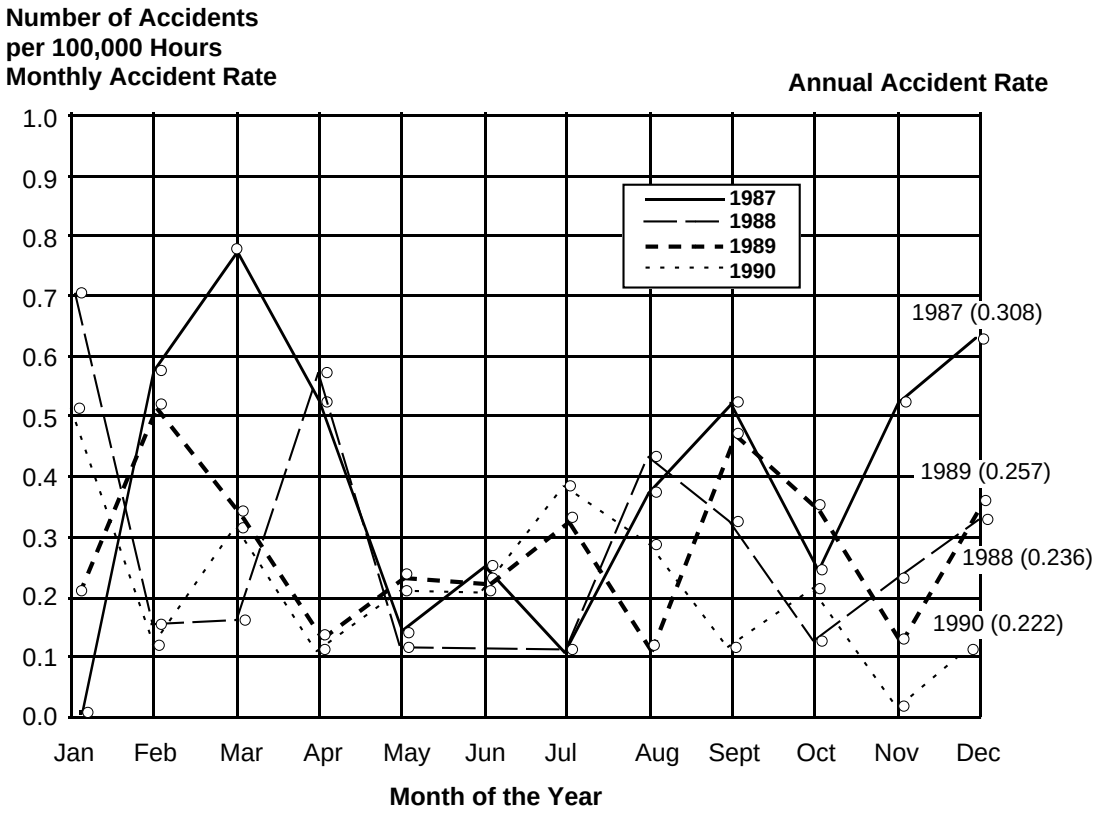


Figure 3

Monthly Accident Rate per 100,000 Aircraft Hours
U.S. Air Carriers — Scheduled Operations
1987-1990



Appendix 1

Fatal Accidents and Fatalities
U.S. Air Carriers Operating Under 14 CFR 121
All Scheduled Service
(Airlines)
1990 (Preliminary Data)

					Fatalities					
Date	Location	Operator	Service	Aircraft	Psgr	Crew	Other	Total	Total Abroad	Reported Type of Accident
1/18	Atlanta, Ga., U.S.	Eastern Airlines	Psgr	B-727-231	0	0	1	1	158	Runway collision with a General Aviation aircraft during landing.
1/31	Indianapolis, Ind., U.S.	Federal Express	Cargo	B-727-23	0	0	1	1	3	Ground employee fatally injured while attempting to tow aircraft.
3/13	Phoenix, Ariz., U.S.	Alaska Airlines	Psgr	B-727-227	0	0	1	1	41	Aircraft struck pedestrian on runway during takeoff.
5/05	Guatemala City, Guatemala	Translados	Cargo	M/D DC-6	0	3	24	27	3	Crashed into a residential neighborhood just after takeoff.
10/03	Atlantic Ocean	Eastern Airlines	Psgr	M/D DC-9-31	1	0	0	1	97	Passenger dies as result of injuries received during in-flight encounterwith turbulence.
12/03	Detroit, Mich., U.S.	Northwest Airlines	Psgr	M/D DC-9-10	7	1	0	8	42	Runway collision in fog. One aircraft taking off and one taxiing.
		Northwest Airlines	Psgr	B-727	0	0	0	0	156	

U.S.S.R. Safety Information

Accidents Involving Gas-turbine Aircraft
All Types of Service
January 1, 1990-December 31, 1990

Source: State Supervisory Commission for Flight Safety (Gosavianadzor), Council of Ministers, U.S.S.R.

Date	Aircraft	Nature of Flight	Total Aboard		Injuries to Occupants Fatal	Other
1/3	Tu-134	Psgr.	6	crew	4	2
			65	psgr.	23	42

Fire en route. The crew reported a fire and made an emergency landing at the field. The cause of the fatal accident: fire in the rear underfloor cargo compartment due to a short circuit.

2/3	Il-86	psgr.	12	crew	—	—
			347	psgr.	—	—

Left main gear failure during the landing run. The cause of the accident: manufacturing defect.

2/6	Tu-134	psgr.	5	crew	—	—
			65	psgr.	—	—

Engine failure en route. The crew made an emergency landing. The cause of the accident: manufacturing defect.

2/28	Yak-42	psgr.	3	crew	—	—
			120	psgr.	—	—

Gear-up landing. The cause of the accident: pilot error.

3/27	Il-76	cargo	9	crew	9	—
			—	psgr.	—	—

Stall during approach to land. The cause of the fatal accident: pilot error, ATC fault.

4/8	Tu-154	psgr.	4	crew	—	—
			164	psgr.	—	—

Struck a refueller while taxiing. The cause of the accident: crew error and ground support service fault.

(continued)

Date	Aircraft	Nature of Flight	Total Aboard		Injuries to Occupants Fatal	Other
4/19	Tu-154	psgr.	4	crew	—	—
			153	psgr.	—	—

During the descent, the crew erroneously engaged the reverse thrust of two engines instead of deploying the spoilers. The landing was performed with one engine operative. The plane ran off the runway. The cause of the accident: pilot error.

6/2	An-24	psgr.	4	crew	—	—
			29	psgr.	—	—

Hard landing on the nose gear, the plane caught fire and was destroyed. The cause of the accident: crew error.

6/12	Il-76	cargo	10	crew	10	—
			—	psgr.	—	—

On approach, the plane was struck by “Stinger” missile.

6/12	Tu-154	psgr.	4	crew	—	—
			140	psgr.	—	—

On taxiing, struck a lamppost. The cause of the accident: crew error and bad markings at Gdansk Airport.

6/29	An-12	cargo	7	crew	—	—
			—	psgr.	—	—

On taxiing, struck another aircraft. The cause of the accident: crew error, ground service personnel error.

6/30	Il-62	psgr.	5	crew	—	3
			97	psgr.	—	2

Ran off runway on landing. The cause of the accident: crew error, deficiencies in pilot training.

8/1	Yak-40	psgr.	3	crew	3	—
			43	psgr.	43	—

Struck a hill on descent. The cause of the fatal accident: crew’s unauthorized straightening the route, ATC error.

(continued)

Date	Aircraft	Nature of Flight	Total Aboard		Injuries to Occupants Fatal	Other
8/9	An-24	psgr.	4	crew	—	—
			48	psgr.	—	—

On taxiing, struck a vehicle standing on the side of the taxiway with the left wing. The cause of the accident: crew error, ground support services fault.

8/10	An-24	psgr.	3	crew	—	—
			40	psgr.	—	—

Gear-up landing. The cause of the accident: crew error.

8/15	Yak-42	psgr.	3	crew	—	—
			120	psgr.	—	—

On taxiing, struck another aircraft. The cause of the accident: deficiencies in organization and flight control at the airport.

9/9	Yak-40	psgr.	4	crew	—	—
			18	psgr.	—	—

Ran off runway and struck another aircraft. The cause of the accident: crew error on approach.

9/13	Yak-42	psgr.	5	crew	1	4
			124	psgr.	3	34

Premature descent and striking trees short of the runway. The cause of the accident: crew error, deficiencies in duty distribution among the crewmembers.

10/14	Tu-154	psgr.	4	crew	—	—
			57	psgr.	—	—

While taxiing from the ramp involving a 180-degree turn, struck another aircraft. Wing and fuselage structure damaged. Investigation is in progress.

10/20	Tu-154	psgr.	6	crew	—	—
			164	psgr.	—	—

On takeoff run at rotation speed, the crew failed to lift off the aircraft. The takeoff was rejected and aircraft ran off runway. The cause of the accident: center of gravity displacement, exceedance of the takeoff weight limit.

(continued)

Date	Aircraft	Nature of Flight	Total Aboard		Injuries to Occupants Fatal	Other
11/31	Tu-154	psgr.	4	crew	—	—
			170	psgr.	—	—

On the ramp, waiting for towing, the captain released the brakes. The aircraft rolled back and damaged another aircraft on the ramp. The cause of the accident: crew error, lack of crew coordination.

11/17	Tu-154	cargo	6	crew	—	—
			—	psgr.	—	—

Fire in flight, emergency landing in a field. Full hull loss. Investigation is in progress.

11/21	Il-62	psgr.	10	crew	—	2
			174	psgr.	—	18

On landing at an alternate airfield, the aircraft ran off the runway, damaging the fuselage, wings and landing gear. The cause of the accident: crew error, deficiencies in operations organization.

12/12	Tu-154	psgr.	10	crew	—	—
			150	psgr.	—	—

On approach, the left gear failed to extend. On landing, the left wing was damaged. The investigation is in progress.

12/14	An-24	psgr.	4	crew	—	2
			39	psgr.	—	—

The plane landed hard 60 meters (200 feet) short of the runway end and the fuselage structure was damaged. Flight crew made premature descent. The investigation is in progress.

Reports Received at FSF Jerry Lederer Aviation Safety Library

Reports

Aircraft Accident Report: United Airlines Flight 232, McDonnell Douglas DC-10-10 Sioux Gateway Airport, Sioux City, Iowa, July 19, 1989. — Washington, D.C., U.S. : U.S. National Transportation Safety Board (NTSB); Springfield, Virginia, U.S.: Available from NTIS*, 1990. Report NTSB/AAR-90/06, PB90-910406. 126p.

Key Words
1. Aeronautics — Accidents — 1989.
2. Aeronautics — Accidents — Engine Failure.
3. Aeronautics — Accidents — Hydraulic Systems.
4. Aeronautics — Accidents — Inspection Procedures.
5. Aeronautics — Accidents — Maintenance.
6. Aircraft Cabins — Safety Measures.
7. Airplanes — Maintenance and Repair — United States.
8. United Airlines — Accidents — 1989.

Summary: The DC-10-10, N1819U experienced a catastrophic failure of the No. 2 tail-mounted engine during cruise flight. The separation, fragmentation and forceful discharge of stage 1 fan rotor assembly parts from the No. 2 engine led to the loss of the three hydraulic systems that powered the airplane's flight controls. The flight crew experienced severe difficulties controlling the airplane, which subsequently crashed during an attempted landing at Sioux Gateway Airport, Iowa. There were 285 passengers and 11 crewmembers onboard. One flight attendant and 110 passengers were fatally injured.

The Board determines that the probable cause of this accident was the inadequate consideration given to human factors limitation in the inspection and quality control procedures used by United Airlines' engine overhaul facility which resulted in the failure to detect a fatigue crack originating from a previously undetected metallurgical defect located in a critical area of the stage 1 fan disk that was manufactured by General Electric Aircraft Engines. The subsequent catastrophic disintegration of the disk resulted in the liberation of debris in a pattern of distribution and with energy levels that exceeded the level of protection provided by design features of the hydraulic systems that operate the DC-10's flight controls. [Executive summary]

Recommendations A-89-95 through A-89-97, A-90-78 through A-90-79, A-90-88 through A-90-91, A-90-147 through A-90-155, and A-90-167 through A-90-177 were issued as a result of this accident. Topics include engine fan rotor assembly design, certification, manufacturing, and inspection; maintenance and inspection of engine fan rotor assemblies; hydraulic flight control system design, certification, and protection from uncontained engine debris; cabin safety, including infant restraint systems; and aircraft rescue and firefighting facilities. [Abstract]

*Airline Deregulation: Trends in Airfares at Airports and Medium-Sized Communities. Report of Congressional U.S. General Accounting Office (GAO)***. — Washington, D.C., U.S. : U.S. Accounting Office, November, 1990. Report GAO/RCED-91-13; 25p.

Key Words
1. Airlines — Fares — United States.
2. Airlines — Rates — United States.
3. Local Service Airlines — United States.
4. Competition — United States.
5. Airlines — Deregulation — United States.

Summary: GAO examined airfares since deregulation (1978) for airports serving small

and medium-sized communities (600,000 or less) and compared fare changes at these airports with those at airports serving the nation's largest communities. GAO also examined average yields — fares per passenger mile — in 1979, 1984, and 1988 for flights from airports serving the different-size communities. GAO findings generally corroborate those reported by the DOT in February 1990 — airfares are lower since deregulation at airports of all sizes and that small cities benefited from the greatest decline in fares. Overall, average fares per passenger mile, adjusted for inflation, were more than 9 percent lower in 1988 than in 1979 at airports serving small and medium-sized communities and about 5 percent lower at airports serving large communities. Decreases varied widely. Twenty nine of the 112 airports reviewed experienced increases in fares, including 15 of the 38 medium-sized community airports.

Aircraft Accident Report: Aloha IslandAir, Inc., Flight 1712, DeHavilland Twin Otter, DHC-6-300, N707PV, Halawa point, Molokai, Hawaii, October 28, 1989. — Washington, D.C., U.S. : U.S. National Transportation Safety Board (NTSB); Springfield, Virginia, U.S. : Available from NTIS*, September 25, 1990. Report NTSB/AAR-90/05, PB90-910405. 40p.

Key Words
1. Aeronautics — Accidents — 1989.
2. Aeronautics — Accidents — Night Flying.
3. Aeronautics — Accidents — Pilot Training.
4. Aeronautics — Accidents — Visual Flight Rules.
5. Aeronautics — Accidents — Weather.
6. Aloha Islandair — Accidents — 1989.

Summary: On October 28, 1989, about 1837 Hawaiian Standard Time, Flight 1712 collided with mountainous terrain while en route on a scheduled passenger flight from the Kahului Airport, Maui, to Kaunakakai Airport, Molokai, Hawaii. The flight was operating under 14 CFR Part 135 and conducted under visual flight rules (VFR). The airplane was in a wings-level attitude on a heading of 260 degrees when it struck the rising terrain. This final heading was determined to have been the normal heading routinely used by other flights as they travelled over water parallel to the north shore of Molokai en route to the Kaunakakai Airport. The aircraft was destroyed; the two pilots and all 18 passengers received fatal injuries. The NTSB determines that the probable cause of this accident was the decision of the captain to continue flight under visual flight rules at night into instrument meteorological conditions (IMC), which obscured rising mountainous terrain. Contributing to the accident was the inadequate supervision of personnel, training, and operations by Aloha IslandAir management. Also contributing to the accident was insufficient oversight by the U.S. Federal Aviation Administration (FAA) of Aloha IslandAir during a period of rapid operational expansion and corporate growth. (Executive summary)

As a result of this investigation, the Safety Board made recommendations to the FAA pertaining to surveillance of 14 CFR Part 135 operators and operating procedures, and flight following in the Hawaiian Islands (A-90-135-141). It also reiterates Safety Recommendation A-86109 to the U.S. Federal Aviation Administration (FAA) on ground proximity warning systems. Other recommendations were made to the National Weather Service to include the possibility of orographic clouds in weather reports (A-90-142), Aloha IslandAir regarding crew training (A-90-143-144), and to the Regional Airlines Association and the Aircraft Owners and Pilots Association to inform their members of the circumstances of this accident (A-90-145).

Smoke hoods: Net Safety Benefit Analysis. — London, England : Civil Aviation Authority (CAA); November 1987. CAA Paper 87017. 21p., ill. ISBN 0-86039-330-5.

Key Words
1. Aircraft Survival Equipment.
2. Airplanes — Protective Breathing Equipment.
3. Airplanes — Smoke Hoods.
4. Evacuation of Airplanes.

5. Survival (After Airplane Accidents, Shipwrecks, etc.)
6. Aeronautics, Commercial — Safety Measures.

Contents: Introduction — Principles of the Analysis — Accidents — FAA Analysis — Remaining Accidents — Conclusions — References — Tables — Appendix I: FAA Model — Appendix II: Accident Summary.

Summary: This report is a result of a collaborative study by CAA, FAA (U.S.), DGAC (France) and Transport Canada. The study is an assessment of the net safety benefit, and any likely offset due perhaps to delays in evacuation induced by the use of smoke hoods. Survivable accidents 1966-1986 involving passenger fatalities or aircraft cabin fires in transport aircraft certified to carry more than 30 passengers were the basis for the study. The report concludes that the provision of effective passenger smoke hoods in public transport aircraft of more than 30 seats would result in a modest saving of life, even if the wearing of smoke hoods were to result in a delayed or slower evacuation.

Airline Competition: Passenger Facility Changes Represent a New Funding Source for Airports. Report to the Chairman, Subcommittee on Aviation, Committee on Public Works and Transportation, House of Representatives / U.S. General Accounting Office**. — Washington, D.C., U.S. : U.S. General Accounting Office, December, 1990. Report GAO/RCED-91-39; B-240359.2. 19p.

Key Words
1. Airports — Finance — United States.
2. Airport Terminals — Planning — United States.
3. Airlines — United States.

Summary: This report addresses ways to ensure that regulations covering passenger facility charges (PFC) will further the Congress' goal of enhancing airport capacity, safety, and security and reducing noise. PFCs give airports a way to raise funds for capital projects that is not dependent on airline approval. The additional capacity financed by such charges should help enhance competition by allowing for additional airline service. A PFC will be especially useful at airports where one or two airlines control most of the traffic or most of the gates and other essential facilities through restrictive leases. However, problems such as the impact of expansion on surrounding communities may involve decisions between competing economic and environmental goals that cannot be solved by increased funding alone.

Advisory Circular 120-27B, 10/25/90, Aircraft Weight and Balance Control. — Washington, D.C., U.S. : U.S. Federal Aviation Administration, AFS-330; October, 1990. 10p.

Key Words
1. Airplanes — Weight and Balance.
2. Aeronautics, Commercial — Law and Legislation — United States.

Note: Cancels AC 120-275A dated May 14, 1980.

Summary: This advisory circular provides a method and procedures for developing a weight balance control system to certificate holders that are required to have an approved weight and balance program under U.S. Federal Aviation Regulations (FAR) Part 121 or elect to have an approved program under FAR Part 135. An operator may submit, for inclusion into its operations specifications, any method and procedure which shows that an aircraft will be properly loaded and will not exceed approved weight and balance limitations during operation.

Federal Aviation Regulations, Part 65 - Certification: Airmen Other Than Flight Crewmembers, Change 14, effective October 2, 1990. Federal Aviation Regulations, Part 108 - Airplane Operator Security, Change 8, effective October 2, 1990. Federal Aviation Regulations, Part 135 - Air Taxi Operators and Commercial Operators, Change 36, effective October 2, 1990. — Washington, D.C., U.S.

: U.S. Federal Aviation Administration.

Key Words
1. Aeronautics, Commercial — Employees — Certification — United States.
2. Aeronautics, Commercial — Employees — Training — United States.
3. Air Traffic Controllers — Certification — United States.
4. Aviation Mechanics (Persons) — Certification — United States.
5. Flight Crews— Certification — United States.

Summary: These changes incorporate Special Federal Aviation Regulation (SFAR) 58, Advanced Qualification Program, effective October 2, 1990, in the Federal Aviation Regulations. This SFAR establishes a voluntary, alternative method for the training, evaluation, certification, and qualification requirements of flight crewmembers, flight attendants, aircraft dispatchers, instructors, evaluators and other operations personnel subject to the training and qualification requirements of 14 CFR Parts 121 and 135.

Selected Statistics Concerning Pilot-Reported Near Midair Collisions (1985-1988) / U.S. Federal Aviation Administration. — Washington, D.C., U.S. : U.S. Federal Aviation Administration, Office of the Assistant Administrator for Aviation Safety, Office of Safety Analysis, March, 1990. v, 144p. in various pagings.

Key Words
1. Airplanes — Near Mid Air Collisions — United States.
2. Airplanes — Collision Avoidance — United States.

Contents: Executive Summary — Introduction — Overall Trends — Operator Class Involvement — Time of Occurrence — Location of Occurrence — Air Traffic Control Environment — Human and Related Factors — Glossary — Appendices.

Summary: This document describes some of the characteristics and recent trends associated with pilot reported near midair collisions (NMAC). A near midair collision is an incident associated with the operation of an aircraft in which the possibility of a collision occurs as a result of proximity of less than 500 feet to another aircraft, or a report is received from a pilot or flight crew member stating that a collision hazard existed between two or more aircraft. Conflicts between air carrier and general aviation operators account for the largest proportion of total NMAC reports, averaging about 29.7 percent of the total reports. However, the rate of these incidents (0.15 per 100,000 operations) is slightly lower than that for the air carrier versus air carrier category (0.18 per 100,000 operations). This report is the fifth in a series of annual reports of the same title. ♦

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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 accurate.

Morning Rain Mires Aircraft

Boeing 737-300: Minor damage. No injuries.

The air carrier was approaching its destination early in the morning during heavy rain. During the landing, a tire burst and the aircraft could not be controlled enough to stop on the runway.

The aircraft ran off the far end of the runway and became stuck in a muddy area of the overrun. The aircraft did not sustain any major damage and the passengers were able to depart without injury. Cause factors were the combined effects of the slick runway and the blown tire.

Landed into Fog

Boeing 727: No damage. No injuries.

The pilot of the air carrier aircraft inbound to Denver, Colorado, U.S., noticed a fog bank halfway along the runway as the aircraft approached the touchdown zone. The aircraft landed and rolled into the fog where visibility was reduced to one-sixteenth of a mile. The captain took control of the aircraft and began to search for the taxiway so they could exit to the left. The crew spotted the taxiway G sign and the captain slowed the aircraft to exit.

After the aircraft was steered about halfway into the taxiway, the captain reported that the taxiway looked narrow with no apron. The turn was widened after which a slight shudder was felt on the left side of the aircraft. The captain applied extra power and continued the taxi to the ramp. Mud and sludge was found on the gear but there was no damage.

Flaps-Up Speed Exceeded Because of Distraction

Boeing 737: No damage. No injuries.

Shortly after takeoff, with the copilot flying the aircraft, it was found that the number two VHF navigation radio was inoperative on the frequency to which it had been set. The navigation systems were then retuned to allow the copilot to continue to follow the instrument departure procedure by using the captain's horizontal situation indicator.

Post-takeoff flap retraction was initiated while this adjustment was being made, but after the radio problem was solved, it was noticed that the flap lever was in the flap 1 position detent. The lever was immediately raised to the full up position and the power levers retarded to reduce the speed, since the maximum flap retraction airspeed had been exceeded. A slight buffeting was experienced as the flaps retracted slower than usual. The aircraft was returned to the departure airport where a no-flap landing was made and a flap speed exceedance inspection was accomplished. No damage was found to the flap mechanism, and the number two navigation receiver, the cause of the distraction, was replaced.

The flight data recorder information revealed that the aircraft had reached 280 knots with

the flaps in the number 1 position and was at 292 knots when they were fully retracted. The placarded speed limit for the flap 1 position is 230 knots.

Procedures were reviewed with the involved flight crew members and they were assigned additional simulator training.

Collision on Runway

Beechcraft King Air 100 and Boeing 727: King Air destroyed, minor damage to Boeing 727. One fatality.

The air taxi turboprop had arrived at the Atlanta, Georgia, U.S., airport and stopped after the landing rollout approximately 4,000 feet along the runway opposite the taxiway leading to the general aviation parking area. There were no obstructions to visibility but it was nighttime. The Boeing 727 had been cleared to land but its crew was unaware that the smaller aircraft was on the runway ahead. Normally, general aviation aircraft continue past the general aviation taxiway to a high-speed turnoff when other traffic is landing behind them, but it was not clear whether the King Air crew was aware of the closeness of the following traffic or whether the crew had been asked to expedite clearing the runway.

The air carrier crew saw the smaller aircraft only at the last moment and the captain attempted to steer to the left to avoid a collision. However, the right wing of the larger aircraft struck the King Air and the captain taxied off the runway and stopped on a taxiway where the passengers were disembarked using stairs. The Boeing 727 sustained minor damage to the wingtip. The King Air was destroyed and one of the two occupants, both crew members, received fatal injuries.

Low Speed During Approach

de Havilland DHC-6 Twin Otter: Substantial damage. No injuries.

The VFR charter flight was arriving at the Canadian airport during a late summer afternoon. There were a crew of two and six passengers aboard. The pilot-in-command occupied the right seat and the copilot was flying the aircraft.

On final approach, the pilot-in-command informed the copilot that the terrain sloped upward prior to the runway threshold. The operating pilot made the approach with full flaps and both engines at idle. At approximately 100 feet above ground level, the rate of descent increased and the aircraft touched down 30 feet before the runway threshold. The aircraft bounced in an extreme nose-high attitude and the pilot-in-command ordered an increase in power and moved the propeller controls into high rpm position. The copilot pushed the control yoke forward and decided to flare, and the main wheels and tail skid simultaneously touched the runway surface. At this point, the pilot-in-command took control and stopped the aircraft on the runway about 1,000 feet from the threshold. The tailskid had been forced up and the lower portion of the tailcone had been twisted. There was no fire and no injuries.

This was the first time that the copilot had landed in this location, and he had allowed the airspeed to drop during final approach. Because of the slope, the aircraft entered an area where the topography affects the wind, and with the low airspeed, the vertical speed consequently increased and the aircraft landed short. Following that, the copilot's attempt to flare after the bounce in a high nose attitude ended in a stall. It could not be determined whether his failure to comply with the order

to increase power would have affected the outcome.

Pilot Feels Frosty Hand on the Controls

Cessna 414: Substantial damage. No injuries.

The temperature was near freezing in the early morning and the pilot had cleaned off frost that had accumulated on the aircraft overnight during the Canadian winter. The pilot was preparing to depart with five passengers.

After pre-takeoff preparations were complete, the aircraft was cleared for takeoff into a five-knot wind and the pilot applied full power. About 2,000 feet along the runway, at an indicated airspeed of approximately 100 knots, the pilot rotated the aircraft for liftoff.

When the aircraft was at about five feet above the ground, the pilot felt it buffet. Being aware of the effects of the low temperatures and the possibility of leftover moisture refreezing on the wings, the pilot reported that he thought the aircraft might stall once it climbed out of ground effect, so he aborted the takeoff.

With less than 1,000 feet of the 3,100-foot runway length remaining, the pilot reduced the power to idle and applied maximum braking as soon as the aircraft touched down. He turned right to avoid obstructions as the aircraft neared the runway overrun, and the nosegear collapsed when it ran across a depression in the ground.

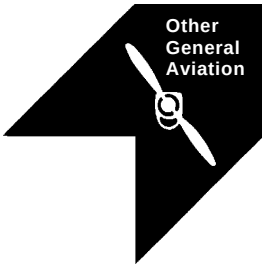
The aircraft sustained substantial damage to the nose gear and lower nose area, but the six occupants departed without injury.

Set-Up for Disaster

Cessna 414: Aircraft destroyed. Fatal injuries to one.

The pilot of the twin-engine business aircraft was taking off in mid-morning from a Texas, U.S., airport. Weather included a low cloud base.

Shortly after the takeoff in instrument meteorological conditions, the aircraft struck powerlines and fell to the ground. The aircraft was destroyed and the pilot sustained fatal injuries. The attitude gyro gave no indication that it had operated properly. A pilot who had flown the aircraft previously stated that he normally pulled the circuit breaker after landing and stated that he had told the other pilot about the procedure — which was not on the checklist. The circuit breaker supplied power to the attitude gyro. This was the first instrument flight in this aircraft for the new pilot.



Game of Musical Chairs Has Off-Key Finale

Piper PA-34-200 Seneca: Substantial damage. No injuries.

The instructor pilot was preparing to practice instrument flight instruction. He fueled the twin-engine aircraft and taxied it to the ramp to pick up another instructor who was to act as the safety pilot on the flight.

Arriving at the ramp to pick up the safety pilot, the instructor left both engines running and set the parking brake. The safety pilot entered the aircraft and climbed into the rear of the cabin through the right front door. Then

the instructor in front moved from the left seat to the right front seat to allow the safety pilot to move into the left front seat from the rear seat.

As this seat switching was going on, the aircraft began to move forward in a gradual left turn without either occupant realizing that the aircraft was moving. The Seneca continued rolling until its left wing struck the right wing strut of a parked Cessna 172. This caused the Seneca to pivot into the fuselage of the other aircraft, causing substantial damage to both aircraft. There was no fire and the two pilots in the Seneca exited with no injuries.

The Seneca's parking brake mechanism was checked and found serviceable. Investigators considered that the parking brake could have been set improperly, but reasoned that the aircraft would not have gained enough speed to have struck the Cessna hard enough to pivot as it did. They concluded that the brake probably had been accidentally released while the instructors were changing seats.

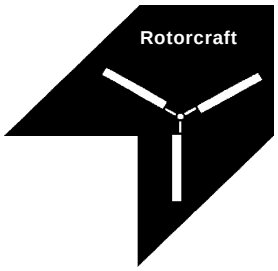
Murphy Is My Copilot

Piper PA-28: Moderate damage. No injuries.

The four-seat, single-engine lightplane had a pilot and three passengers aboard. The pilot was cleared to enter the traffic pattern at the destination airport and was advised that another aircraft was ahead of him on final approach.

When the Piper arrived on final approach, the pilot was advised to go around, and he raised the flaps and gear during the maneuver. When he returned to the downwind leg, the pilot failed to lower the gear. He did not realize the omission until the flare-out prior to touchdown when the propeller hit the runway. By then it was too late to do anything other than to slide to a stop. There was no fire and the four occupants evacuated the aircraft with no injuries.

Slightly more than two years previously, the automatic gear lowering system of the aircraft had been disconnected because of problems with the system, and there was no throttle-connected warning horn on the aircraft.



Almost Made It

Bell 206: Substantial damage. No injuries.

The helicopter was being prepared for a personal flight. The pilot was air taxiing the aircraft to the fuel pump.

He did not have enough fuel to get to his destination on the airport — the rotorcraft ran out of fuel while en route to the fuelling area and landed hard. The main rotor blade struck the tail boom and severed it, substantially damaging the aircraft. The pilot and the three passengers evacuated without injury.

Loose Tarpaulin Becomes Wet Blanket

Sikorsky S55: Aircraft destroyed. Fatal injuries to one. Serious injury to one.

The rotorcraft was being used to transport fire fighting personnel between fire camps. With a pilot and five passengers aboard, it was about to land at a new camp.

As it neared the touchdown area, the helicopter's rotor wash blew up a loose tarpaulin that became wrapped around a main rotor blade, causing the aircraft to buffet violently. The main rotor blades chopped off the aft part of the tail section and the helicopter crashed. Fire ensued immediately, but four of the six occupants escaped without injury. Of the remaining two, one was fatally injured and the other received serious burns. The helicopter was consumed by the fire. ♦