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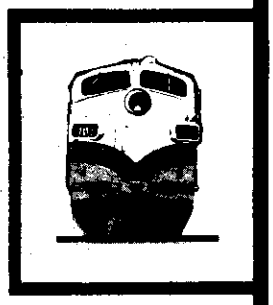
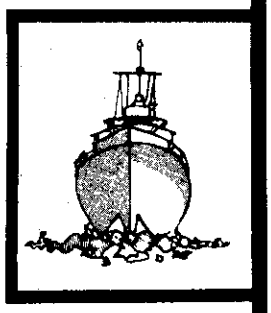
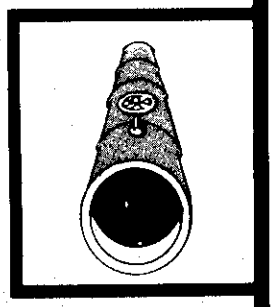




ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. AIR CARRIER OPERATIONS 1977



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1. Report No. NTSB-ARC-78-2	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Annual Review of Aircraft Accident Data, U.S. Air Carrier Operations, 1977		5. Report Date September 6, 1978
		6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address Bureau of Technology National Transportation Safety Board Washington, D.C. 20594		10. Work Unit No. 2447
		11. Contract or Grant No.
12. Sponsoring Agency Name and Address NATIONAL TRANSPORTATION SAFETY BOARD Washington, D. C. 20594		13. Type of Report and Period Covered
		14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This publication presents the record of aviation accidents in all operations of the U.S. air carriers for calendar year 1977. It includes an analysis by class of carrier and type of service in which the 1977 performances were compared with 5-year base-period averages. A 10-year review, 1968 through 1977, of the certificated route carriers is presented for accident rates by aircraft make and model, types of accidents, phases of operation, causes or related factors, and a comparison between scheduled and nonscheduled revenue service. Statistical tables which summarize the accidents, fatalities, and accident rates; causal tables; and briefs of accidents are presented in the appendixes.

17. Key Words Air Carrier Accidents, Injury Index, Accident Rates, Passenger Fatality Rate, Aircraft Damage, Type of Accident, Phase of Operation, Causes and Related Factors		18. Distribution Statement This document is available to the public through the National Technical Information Service, Springfield, VA 22151	
19. Security Classification (of this report) UNCLASSIFIED	20. Security Classification (of this page) UNCLASSIFIED	21. No. of Pages 88	22. Price

NTSB Form 1765.2 (Rev. 9/74)

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ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA
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INTRODUCTION

This report is a compilation and statistical analysis of the U.S. air carrier accidents that occurred during calendar year 1977. The report contains a summary of the 1977 U.S. air carrier safety record and comparative data for the previous 2 years. Data on accidents, fatalities, accident rates, and 1977 growth changes are compared with a base figure which was established by averaging the data for the 5-year period from 1972 through 1976. The data tables in Appendix A, which summarize the accidents, accident rates, and fatalities by year, were the basis for these comparisons. The report also reviews the accident record of the U.S. certificated route carriers for the 10-year period, 1968 through 1977. Accident rates by selected aircraft make and model, types of accidents, phases of operation, causes or related factors, and a comparison between scheduled and nonscheduled revenue services of the certificated route carriers were reviewed.

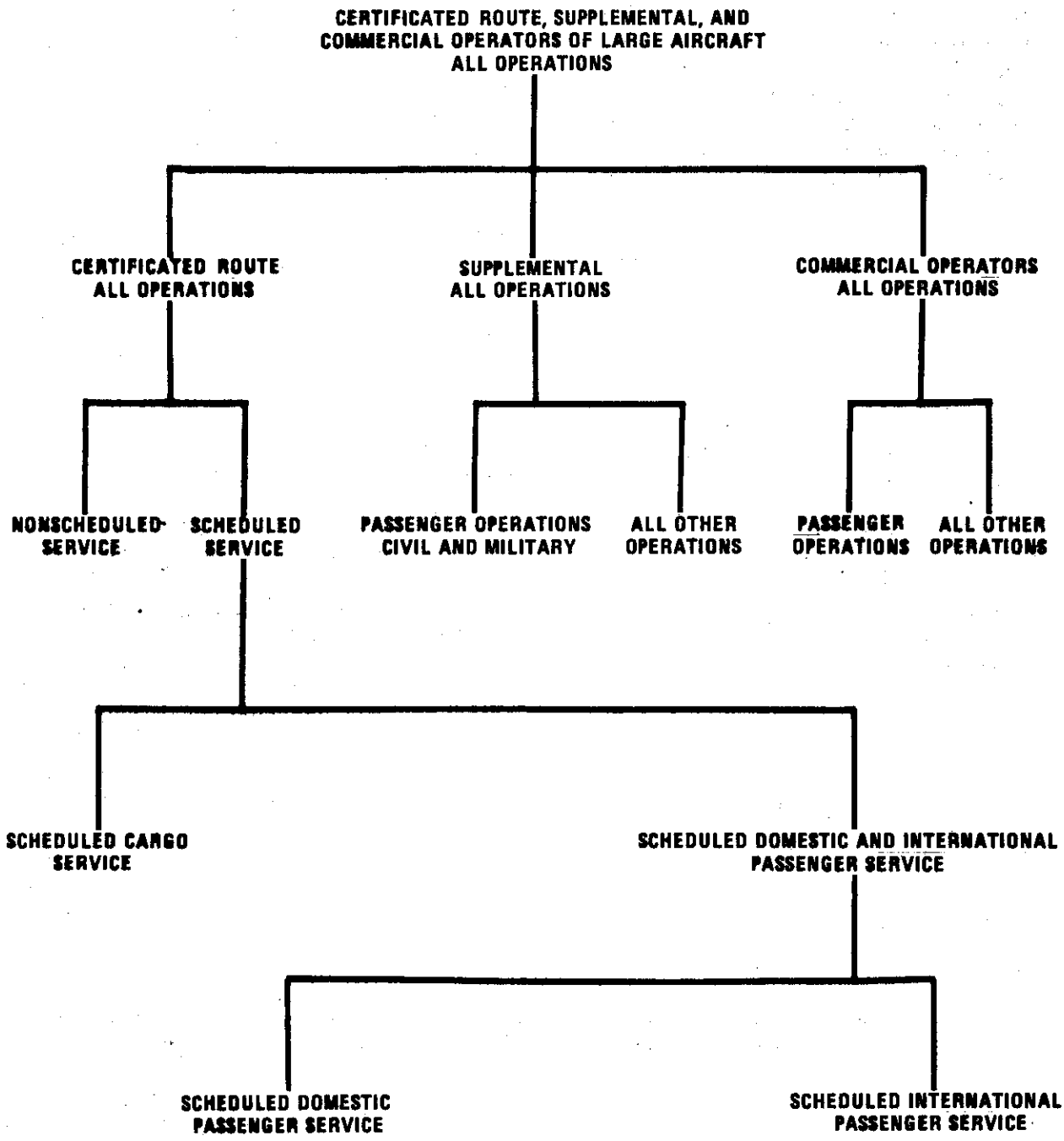
Beginning in 1975, U.S. air carrier statistics included "commercial operators of large aircraft," a category classified previously under general aviation operations. The National Transportation Safety Board has determined that the current size, scope, and complexity of such operations under 14 CFR 121 make them essentially air carriers and that they should be so considered, both operationally and statistically. 1/ Thus, beginning with 1975, U.S. air carriers comprise three operational subsets: 1) Certificated route air carriers, 2) supplemental (charter) air carriers, and 3) commercial operators of large aircraft. The addition of commercial-operator accident data to the accident statistics should be considered when comparing these data with data of previous years that do not include commercial operator data.

Figure 1 identifies the classifications and types of service in which U.S. air carriers are engaged. (See Appendix A.) However, not all categories are summarized or analyzed in this report. The overall operations of each category were emphasized along with the passenger operations within each category. The briefs for accidents which occurred in 1977 are in Appendix B, and Appendix C contains definitions of terms and explanatory notes used in the review.

The Civil Aeronautics Board was the source of the exposure data, such as aircraft-hours flown for U.S. certificated route and supplemental air carriers. Commercial operator exposure data were provided by the Federal Aviation Administration.

1/ *NTSB Safety Recommendation A-74-42, issued May 21, 1974.*

Figure 1.
CLASSIFICATION AND TYPE OF SERVICE, U.S. AIR CARRIERS



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SUMMARY

All Operations

In overall operations of U.S. air carriers (including commercial operators) during 1977, there were 26 aircraft accidents, 5 of which were fatal accidents resulting in 656 fatalities. The 26 accidents represent a record low in U.S. air carrier accidents as far back as the Safety Board's records go to 1949; however, the 656 fatalities represent a record high for U.S. air carrier operations. Most of the fatalities (575) occurred in the collision on the ground between two B-747 aircraft at Tenerife, Canary Islands. The 1977 accident record and records for the previous 2 years are compared in the following table.

All Operations
3-Year Accident Record

	1975	1976	1977
Accidents			
Total	45	28	26
Fatal	3	4	5
Involving Serious Injury	24	16	14
Involving Minor or no Injury	18	8	7
Aircraft Damage			
Destroyed	6	6	4
Substantial	22	10	9
Fatalities			
Passenger	113	39	382
Crewmembers	11	6	17
Other Persons	0	0	257
Total	124	45	656
Miles Flown (Billion) 1/	2.48	2.57	2.68
Hours Flown (Million)	6.04	6.23	6.54
Total Accident Rates			
Per Million Aircraft-Miles	0.018	0.011	0.010
Per 100,000 Aircraft-Hours	0.745	0.450	0.397
Fatal Accident Rates			
Per Million Aircraft-Miles	0.001	0.002	0.002
Per 100,000 Aircraft-Hours	0.050	0.064	0.076

1/ Nonrevenue miles of the supplemental air carriers are not reported.

Certificated Route Carriers

In 1977, the certificated route air carriers had 21 accidents in their total revenue and nonrevenue operations. Four of the 21 were fatal accidents which resulted in 653 fatalities. The distribution of accidents by type of operation was as follows:

Operations	Accidents Total	Accidents Fatal	Fatalities
Scheduled Passenger Service	17	2	75
Scheduled Cargo Service	3	1	3
Nonscheduled Revenue Operations	1	1	575
Nonrevenue Operations			
Training	0	0	0
Ferry	0	0	0
Total	21	4	653
Aircraft-Miles Flown	2,556,080,000		
Aircraft-Hours Flown	6,171,070		

Accident Rates	Total Accidents	Fatal Accidents
Per Million Aircraft-Miles	0.008	0.002
Per 100,000 Aircraft-Hours	0.340	0.065

Scheduled Passenger Service	
Revenue Passengers Carried	240.3 Million
Passenger-Miles Flown	206.2 Billion
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.031

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Supplemental Carriers

The supplemental air carriers had two accidents in 1977 which resulted in no fatal injuries; the accidents were in civil passenger operations.

Operations	Accidents Total	Accidents Fatal	Fatalities
Civil Operations:			
Passenger	2	0	0
Cargo	0	0	0
Military Operations:			
Passenger	0	0	0
Cargo	0	0	0
Training	0	0	0
Ferry	0	0	0
Company flight	0	0	0
Total	2	0	0
Aircraft-Miles Flown 1/	67,699,000		
Aircraft-Hours Flown	184,998		

Accident Rates	Total Accidents	Fatal Accidents
Per Million Aircraft-Miles	0.030	0
Per 100,000 Aircraft-Hours	1.081	0

Passenger Service	
Revenue Passengers Carried	2.8 Million
Passenger-Miles Flown	10.0 Billion
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.0

1/ Nonrevenue miles of the supplemental air carriers are not reported.

Commercial Operators

In 1977, the commercial operators of large aircraft had three accidents, one of which was a fatal accident resulting in three fatalities. These accidents occurred in the following operations:

Operations	Accidents Total	Accidents Fatal	Fatalities
Passenger	1	0	0
Cargo	2	1	3
Training	0	0	0
Ferry	0	0	0
Total	3	1	3

Aircraft-Miles Flown	60,293,000
Aircraft-Hours Flown	185,100

Accident Rates	Total Accidents	Fatal Accidents
Per Million Aircraft-Miles	0.050	0.017
Per 100,000 Aircraft-Hours	1.621	0.540

Passenger Service	
Revenue Passengers Carried	10.8 Million
Passenger-Miles Flown	3.5 Billion
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.0

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ANALYSIS BY CLASS OF CARRIER AND TYPE OF SERVICE

Certificated Route and Supplemental Carriers

In 1977, all operations of U.S. certificated route and supplemental air carriers flew 2.6 billion aircraft miles, an increase of 3.6 percent from the 1972 through 1976 base-period average of 2.5 billion aircraft miles per year. Both total and fatal accidents decreased from the base-period average with total accidents decreasing 43.6 percent and fatal accidents decreasing 35.5 percent. Fatalities increased substantially over the base-period average because of the catastrophic accident at Tenerife, Canary Islands in which 575 persons were killed.

Accidents, Fatalities, Rates, and Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Aircraft-Miles Flown (Thousands)	2,532,792	2,623,779	+3.6
Aircraft-Hours Flown	6,144,457	6,356,068	+3.4
Accidents			
Total Accidents	40.8	23	-43.6
Fatal Accidents	6.2	4	-35.5
Fatal Injuries	209.6	653	+211.5
Accident Rates Per Million Aircraft-Miles Flown			
Total Accidents	0.016 1/	0.009	-43.8
Fatal Accidents	0.002 1/	0.002	No change
Accident Rates Per 100,000 Aircraft-Hours Flown			
Total Accidents	0.661 1/	0.362	-45.2
Fatal Accidents	0.098 1/	0.063	-35.7

1/ A sabotage accident was excluded from the rate computation.

ANALYSIS BY CLASS OF CARRIER AND TYPE OF SERVICE

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1/ A sabotage accident was excluded from the rate computation.

Certificated Route Carriers

All Operations -- During the base-period, 1972 through 1976, U.S. certificated route air carriers in all operations flew an average of 2.5 billion miles per year. In 1977, the figure was 2.6 billion, representing an increase of 4.1 percent. Total accidents decreased 45.9 percent and fatal accidents decreased from an average of 5.8 per year to 4 in 1977 (31 percent decrease). These 4 fatal accidents resulted in 653 fatal injuries or a 214.5 percent increase over the base-period average of 207.6 fatal injuries per year.

Accidents, Fatalities, Rates, And Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Aircraft-Miles Flown (Thousands)	2,454,505	2,556,080	+4.1
Accidents			
Total Accidents	38.8	21	-45.9
Fatal Accidents	5.8	4	-31.0
Fatal Injuries	207.6	653	+214.5
Accident Rates Per Million Aircraft-Miles Flown			
Total Accidents	0.016 1/	0.008	-50.0
Fatal Accidents	0.002 1/	0.002	No change
Fatality Rate Per Million Aircraft-Miles Flown	0.077 1/	0.255	+231.2

1/ A sabotage accident was excluded from the accident rate and fatality rate computations.

All Scheduled Service -- The all scheduled service segment of U.S. air carrier operations showed an increase in aircraft activity. Aircraft-miles flown increased 4.1 percent, aircraft-hours flown increased 3.4 percent, and aircraft departures increased 1.3 percent. Both the total and fatal accidents decreased from the base-period averages along with the corresponding accident rates measured against miles flown, hours flown, and departures. During the base period, an average aircraft flew 477 miles per departure at an average speed of 414 mph. In 1977, the average aircraft flew 490 miles per departure at 417 mph.

Accidents, Accident Rates, Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Aircraft-Miles Flown (Thousands)	2,322,917	2,418,652	+4.1
Aircraft-Hours Flown	5,608,564	5,800,843	+3.4
Aircraft Departures	4,873,009	4,934,094	+1.3
Accidents			
Total Accidents	35.4	20	-43.5
Fatal Accidents	5.2	3	-42.3
Accident Rates Per Million Aircraft-Miles Flown			
Total Accidents	0.015 1/	0.008	-46.7
Fatal Accidents	0.002 1/	0.001	-50.0
Accident Rates Per 100,000 Aircraft-Hours Flown			
Total Accidents	0.628 1/	0.345	-45.1
Fatal Accidents	0.089 1/	0.052	-41.6
Accident Rates Per 100,000 Aircraft Departures			
Total Accidents	0.722 1/	0.405	-43.9
Fatal Accidents	0.103 1/	0.061	-40.8

1/ A sabotage accident was excluded from the accident rate computation.

Scheduled Domestic and International Passenger Service -- In 1977, the number of passengers carried for this segment of U.S. certificated route air carriers increased 17 percent over the base-period average. Passenger-miles flown also increased (18.6 percent) from the base-period figure of 173.9 billion to 206.2 billion in 1977. Accidents in 1977 decreased 48.8 percent, and fatal accidents decreased 58.3 percent compared with the base-period averages. In 1977, fatal injuries decreased from an average of 204.6 per year to 75 (63.3 percent decrease), and the passenger fatality rate per 100 million passenger-miles flown decreased 68 percent from 0.097 to 0.031.

Accidents, Accident Rates, Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Passengers Carried	205,393,528	240,326,516	+17.0
Passenger-Miles Flown (Thousands)	173,919,463	206,205,410	+18.6
Accidents			
Total Accidents	33.2	17	-48.8
Fatal Accidents	4.8	2	-58.3
Fatal Injuries			
Passengers	185.2	64	-65.4
Crew	16.8	2	-88.1
Other	2.6	9	+246.2
Total	204.6	75	-63.3
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.097 1/	0.031	-68.0

1/ A sabotage accident with 79 passenger and 9 crew fatalities is included in all computations except rates.

Scheduled Domestic Passenger Service -- During 1977, U.S. certificated route air carriers engaged in scheduled domestic passenger service carried 222.3 million passengers -- an 18.5 percent increase over the base-period average of 187.6 million. Passenger-miles flown increased 20.6 percent over the base figure, whereas total and fatal accidents decreased 43.6 and 37.5 percent, respectively. Passenger fatalities decreased 42.9 percent with a corresponding decrease of 53.1 percent in the passenger fatality rate per 100 million passenger-miles flown in 1977 compared with the base-period average.

Accidents, Accident Rates, Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Passengers Carried	187,588,819	222,283,516	+18.5
Passenger-Miles Flown (Thousands)	137,957,946	166,424,934	+20.6
Accidents			
Total Accidents	26.6	15	-43.6
Fatal Accidents	3.2	2	-37.5
Fatal Injuries			
Passengers	112.0	64	-42.9
Crew	8.4	2	-76.2
Other	2.4	9	+275.0
Total	122.8	75	-38.9
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.081	0.038	-53.1

Scheduled International Passenger Service -- In 1977, the number of passengers carried in scheduled international passenger service increased 1.3 percent and passenger-miles flown increased 10.6 percent. Accidents in 1977 decreased from the base-period average of 6.8 to 3 (55.9 percent). There were no fatal accidents in 1977 for this segment of air carrier operations.

Accidents, Fatalities, Rates, and Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Passengers Carried	17,804,709	18,043,000	+1.3
Passenger-Miles Flown (Thousands)	35,961,348	39,780,476	+10.6
Accidents			
Total Accidents	6.8	3	-55.9
Fatal Accidents	1.6	0	-100.0
Fatal Injuries			
Passengers	73.2	0	-100.0
Crew	8.4	0	-100.0
Other	0.2	0	-100.0
Total	81.8	0	-100.0
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.160 1/	0	-100.0

1/ A sabotage accident with 79 passenger and 9 crew fatalities is included in all computations except rates.

Supplemental Carriers

All Operations -- Aircraft-miles flown by U.S. supplemental air carriers in 1977 decreased 13.5 percent compared with the base-period average. Total accidents remained unchanged. Fatal accidents decreased 100 percent, and fatalities also decreased 100 percent from a base-period average of two per year to none in 1977.

Accidents, Fatalities, Rates, And Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Aircraft-Miles Flown 1/	78,288,000	67,699,000	-13.5
Accidents			
Total Accidents	2.0	2	No Change
Fatal Accidents	0.4	0	-100.0
Fatal Injuries	2.0	0	-100.0
Accident Rates Per Million Aircraft-Miles Flown			
Total Accidents	0.026	0.030	+15.4
Fatal Accidents	0.005	0	-100.0
Fatality Rate Per Million Aircraft-Miles Flown	0.026	0	-100.0

1/ Nonrevenue miles not reported.

Passenger Operations - Civil and Military -- For the seventh consecutive year, U.S. supplemental air carriers engaged in civil and military contract passenger operations had no fatal accidents in 1977 -- the ninth year out of the past eleven in which no fatal accidents were recorded.

Accidents, Fatalities, Rates, And Growth Changes From Base (1972-1976)

	Base	1977	Percentage Change
Passengers Carried	2,956,412	2,793,761	-5.5
Passenger-Miles Flown (Thousands)	9,932,195	9,983,404	+0.5
Accidents			
Total Accidents	0.8	2	+150.0
Fatal Accidents	0.0	0	No Change
Fatal Injuries			
Passengers	0.0	0	No Change
Crew	0.0	0	No Change
Other	0.0	0	No Change
Total	0.0	0	No Change
Passenger Fatality Rate Per 100 Million Passenger-Miles Flown	0.0	0	No Change

REVIEW OF 10-YEAR PERIOD
1968 THROUGH 1977
U.S. CERTIFICATED ROUTE AIR CARRIERS

The accident record of the certificated route air carriers for the past 10 years, 1968 through 1977, has been summarized in the following categories: (1) Accident rates by make and model, (2) types of accidents, (3) phases of operation, (4) causes or factors, and (5) scheduled compared to nonscheduled revenue service.

Accident Rates by Make and Model

Accidents and accident rates by aircraft make and model used in all operations of the U.S. certificated route carriers are shown in the following table for the years 1968 through 1977. All aircraft makes and models are not represented; however, the makes and models which appear in the table accounted for 91 percent of the accidents and 97 percent of the total hours flown in the 10-year period.

Accidents, Rates By Aircraft Make and Model
U.S. Certificated Route Air Carriers
1968 through 1977

Aircraft Make and Model	Accidents Total	Accidents Fatal	Aircraft Hours-Flown	Accident Rates Per 100,000 Aircraft Hours-Flown Total	Accident Rates Per 100,000 Aircraft Hours-Flown Fatal
B-747	27	2	2,434,648	1.11	0.08
B-707 1/	66	14 2/	10,319,643	0.63	0.11
B-720	10	1	1,914,354	0.52	0.05
B-727	87	9	17,830,157	0.49	0.05
B-737	11	1	2,526,640	0.44	0.04
DC-8	54	4	6,086,927	0.89	0.07
DC-9	42	11 2/	8,419,724	0.50	0.11
DC-10	10	1	1,589,693	0.63	0.06
L-1011	10	1	812,405	1.23	0.12
L-188	6	2	346,881	1.73	0.58
CV-580, 600, 640	30	7 2/	2,373,959	1.26	0.25
CV-880	5	1	687,067	0.73	0.15
BAC 1-11	6	0	964,318	0.62	0.00
DHC-6	5	2	168,872	2.96	1.18
F-27, FH-227	15	9	1,242,356	1.21	0.72
YS-11	5	0	449,111	1.11	0.00
M-404	2	1	385,809	0.52	0.26
S-61	6	3	63,724	9.42	4.71
Total	434	70	60,697,599	0.71	0.11

1/ A sabotage accident which occurred September 8, 1974, is included in all computations except rates.
2/ Includes midair collision accidents nonfatal to air carrier occupants, excluded in fatal accident rates.

Types of Accidents

Types of accidents in the 10-year period 1968 through 1977 are listed in the following table in descending order of frequency. The first eight accident types -- turbulence; miscellaneous/other; collided with wires, trees, towers, etc.; collision with ground/water; engine failure or malfunction; gear collapsed; fire or explosion on the ground; and collision between aircraft both on the ground -- accounted for 73.9 percent of all the accident records. (See Figure 2.)

Similarly, for fatal accidents, the accident types -- collision with ground/water; collided with wires, trees, towers, etc.; midair collision; undershoot; prop/rotor accident to person; turbulence; propellor/rotor failure; and miscellaneous/other -- accounted for 80.2 percent of all the fatal accident records. (See Figure 3.)

Total Accidents
Type of Accident
1968 through 1977

Type of Accident	Frequency	Percent of Total
Turbulence	141	32.0
Miscellaneous/Other	42	9.5
Collided with wires, trees, towers, etc.	39	8.8
Collision with ground/water	27	6.1
Engine failure or malfunction	25	5.7
Gear collapsed	22	5.0
Fire or explosion on the ground	16	3.6
Collision between aircraft -- both on ground	14	3.2
Ground loop	11	2.5
Hard landing	11	2.5
Undershoot	11	2.5
Midair collision	11	2.5
Overshoot	10	2.3
Prop/rotor accident to person	8	1.8
Fire or explosion in-flight	7	1.6
Evasive maneuver	6	1.4
Stall/spin/spiral/mush	5	1.1
Wheel-up landing	5	1.1
Airframe failure in-flight	5	1.1
Nose over/down	4	0.9
Airframe failure on the ground	4	0.9
Propeller/rotor failure	4	0.9
Gear retracted	3	0.7
Wheels-down landing in water	2	0.4
Collision between aircraft -- one airborne	2	0.4
Uncontrolled altitude deviation	2	0.4
Bird strike	1	0.2
Hail damage to aircraft	1	0.2
Lightning strike	1	0.2
Missing aircraft not recovered	1	0.2
Total	441	

Fatal Accidents
Type of Accident
1968 through 1977

Type of Accident	Frequency	Percent Of Total
Collision with ground/water	21	29.6
Collided with wires, trees, towers, etc.	10	14.1
Midair collision	8	11.3
Undershoot	4	5.6
Prop/rotor accident to person	4	5.6
Turbulence	4	5.6
Propellor/rotor failure	3	4.2
Miscellaneous/Other	3	4.2
Overshoot	2	2.8
Collision between aircraft -- one airborne	2	2.8
Stall/spin/spiral/mush	2	2.8
Fire or explosion in-flight	2	2.8
Engine failure or malfunction	2	2.8
Gear collapse	1	1.4
Hard landing	1	1.4
Collision between aircraft -- both on ground	1	1.4
Missing aircraft not recovered	1	1.4
Total	71	

Figure 2
Most Prevalent Accident Types
U.S. Certificated Route Air Carriers
1968 Through 1977

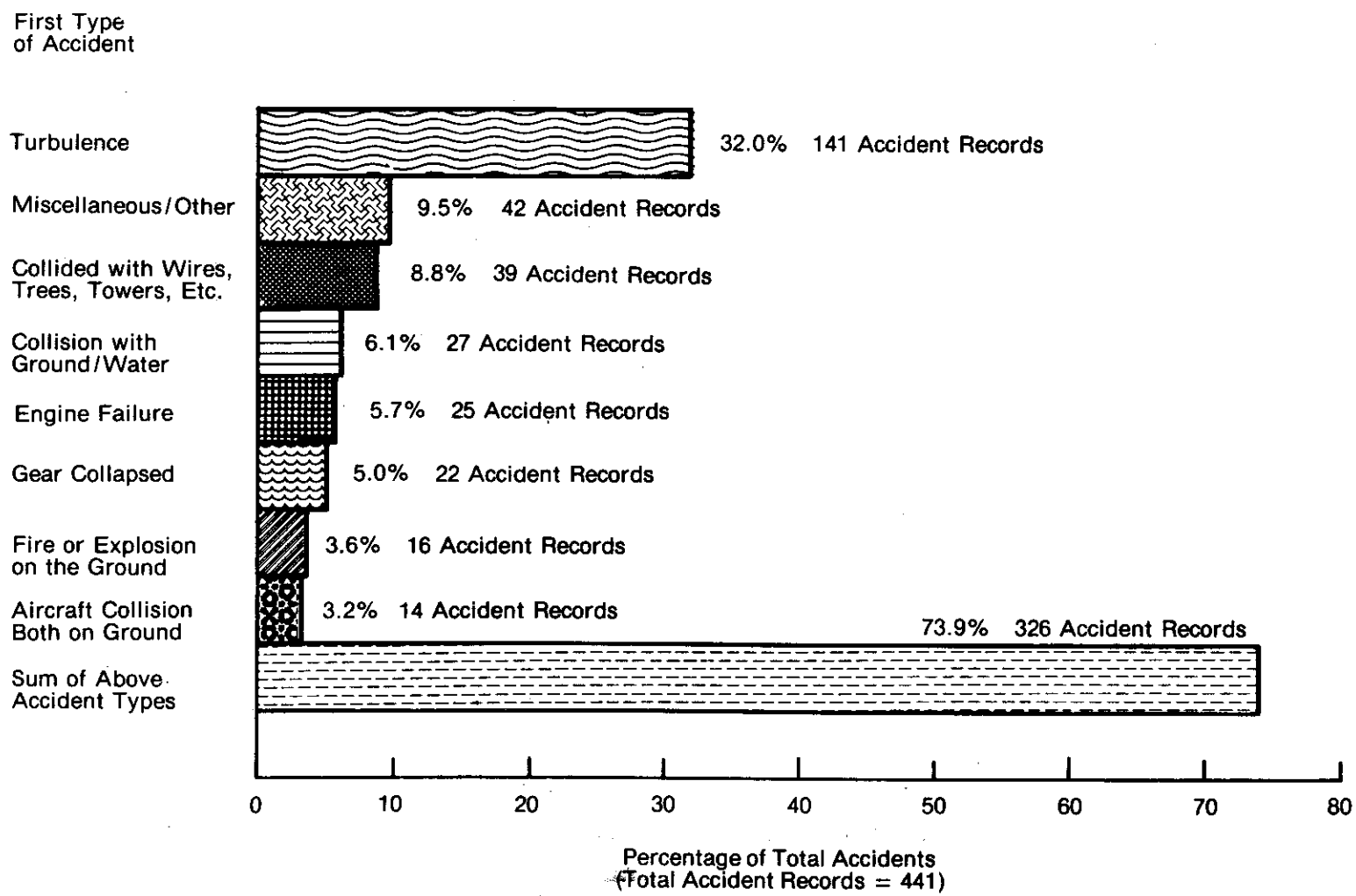
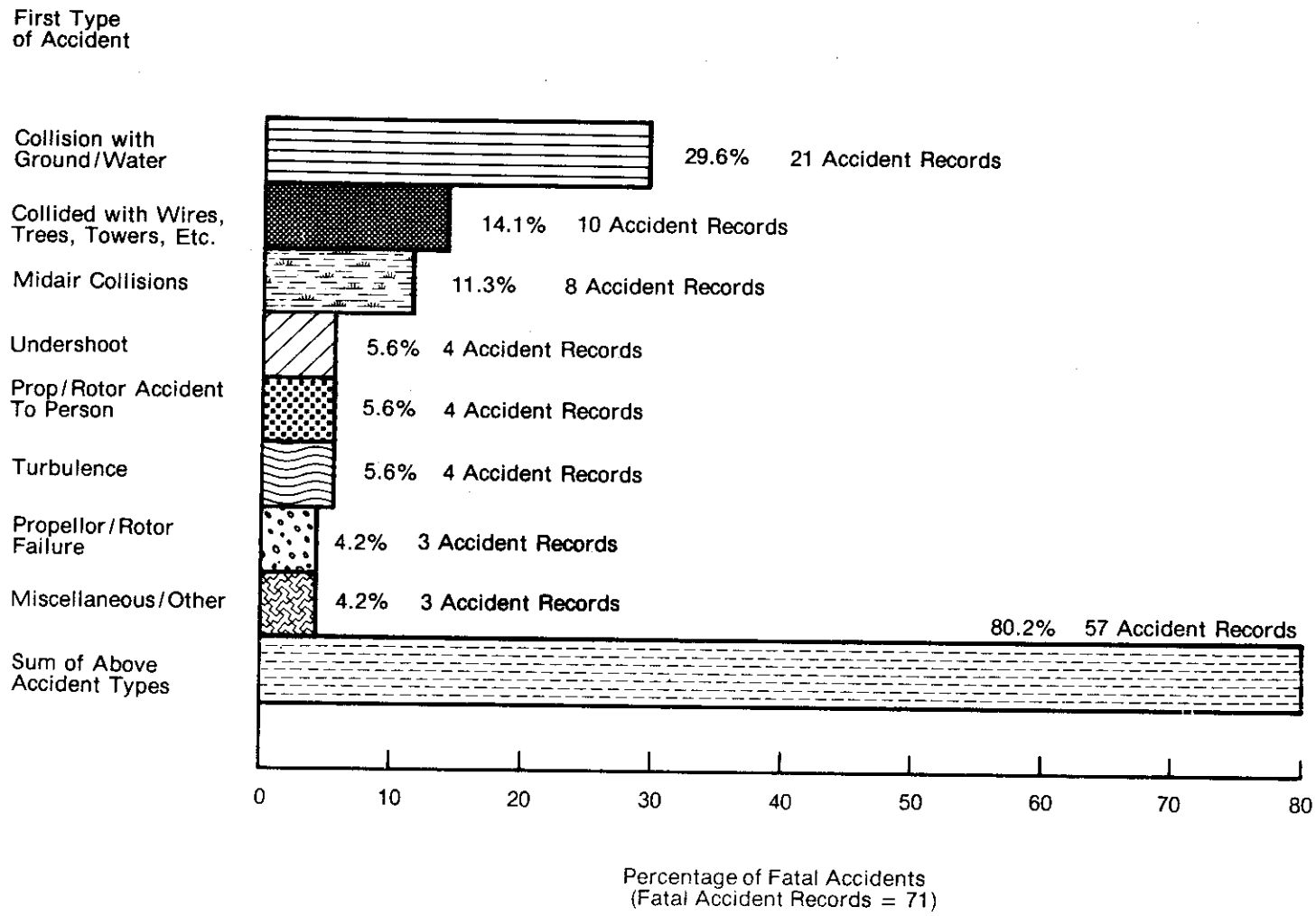


Figure 3
Most Prevalent Fatal Accident Types
U.S. Certificated Route Air Carriers

Figure 3
Most Prevalent Fatal Accident Types
U.S. Certificated Route Air Carriers
1968 Through 1977



Phases of Operation

The percentage distributions of total and fatal accidents by phase of operation are shown in the following table. For total accidents, most of the accidents occurred in the in-flight phase of operation while in fatal accidents most of the accidents occurred during landing.

Phase of Operation
1968 through 1977

Total Accidents

Phase of Operation	Frequency	Percent Of Total
Static	41	9.3
Taxi	42	9.5
Takeoff	44	10.0
In-flight	195	44.2
Landing	118	26.8
Unknown/not reported	1	0.2
Total	441	

Fatal Accidents

Phase of Operation	Frequency	Percent Of Total
Static	6	8.4
Taxi	3	4.2
Takeoff	7	9.9
In-flight	24	33.8
Landing	30	42.3
Unknown/not reported	1	1.4
Total	71	

Figure 4
Phase of Operation Total Accidents

Figure 4
Phase of Operation Total Accidents
U.S. Certificated Route Air Carriers
1968 Through 1977

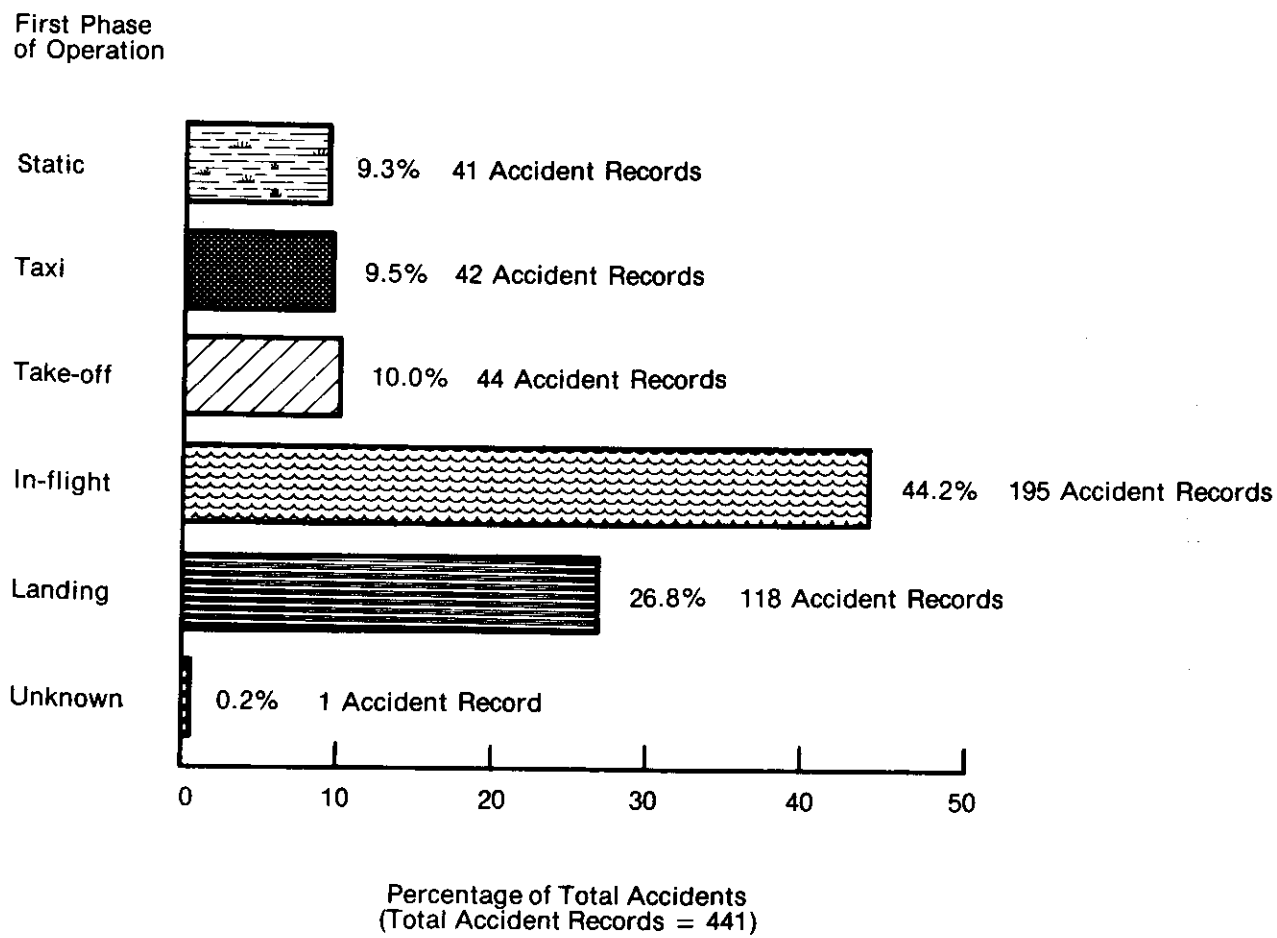
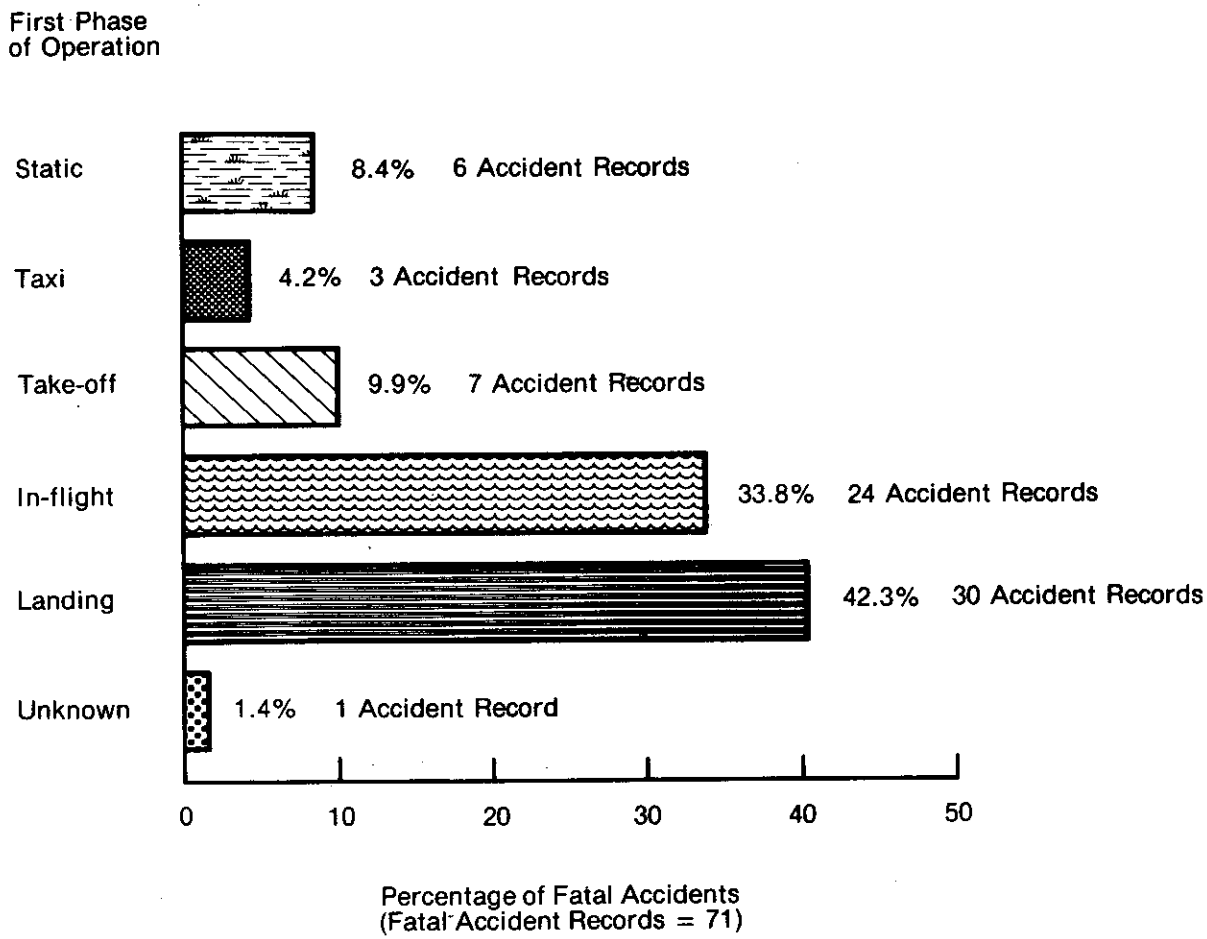


Figure 5
Phase of Operation Fatal Accidents
U.S. Certificated Route Air Carriers
1968 Through 1977



Causes/Fac

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Weather

Personnel

Pilot

Airport/

Landing (

Powerpla

Systems

Miscella

Instrume

Airframe

Terrain

Undeterm

Rotorcra

Note: T
c

Causes/Factors

The percentage distributions of causes or related factors for total and fatal accidents are shown in the following table. For the 10-year period 1968 through 1977, weather was the most frequently cited cause/factor in U.S. certificated route air carrier accidents followed by personnel and the pilot. In fatal accidents, the pilot followed by weather and personnel were the most frequently cited causes/factors.

Causes/Factors
Certificated Route Air Carriers
1968 through 1977

Causes/Factors	Percentage of Total Accidents	Percentage of Fatal Accidents
Weather	48.3	45.3
Personnel	46.6	42.2
Pilot	39.5	62.5
Airport/Airways/Facilities	9.0	4.7
Landing Gear	8.8	3.1
Powerplant	7.3	4.7
Systems	6.6	9.4
Miscellaneous	6.3	12.5
Instruments/Equipment	2.7	3.1
Airframe	2.4	6.2
Terrain	1.7	0.0
Undetermined	1.2	6.2
Rotorcraft	0.7	3.1

Note: The percentage totals exceed 100 percent because multiple causes/factors can be cited in any accident.

Figure 6
Total Accidents
Causes or Related Factors Percentage Distribution
U.S. Certificated Route Air Carriers
1968 Through 1977

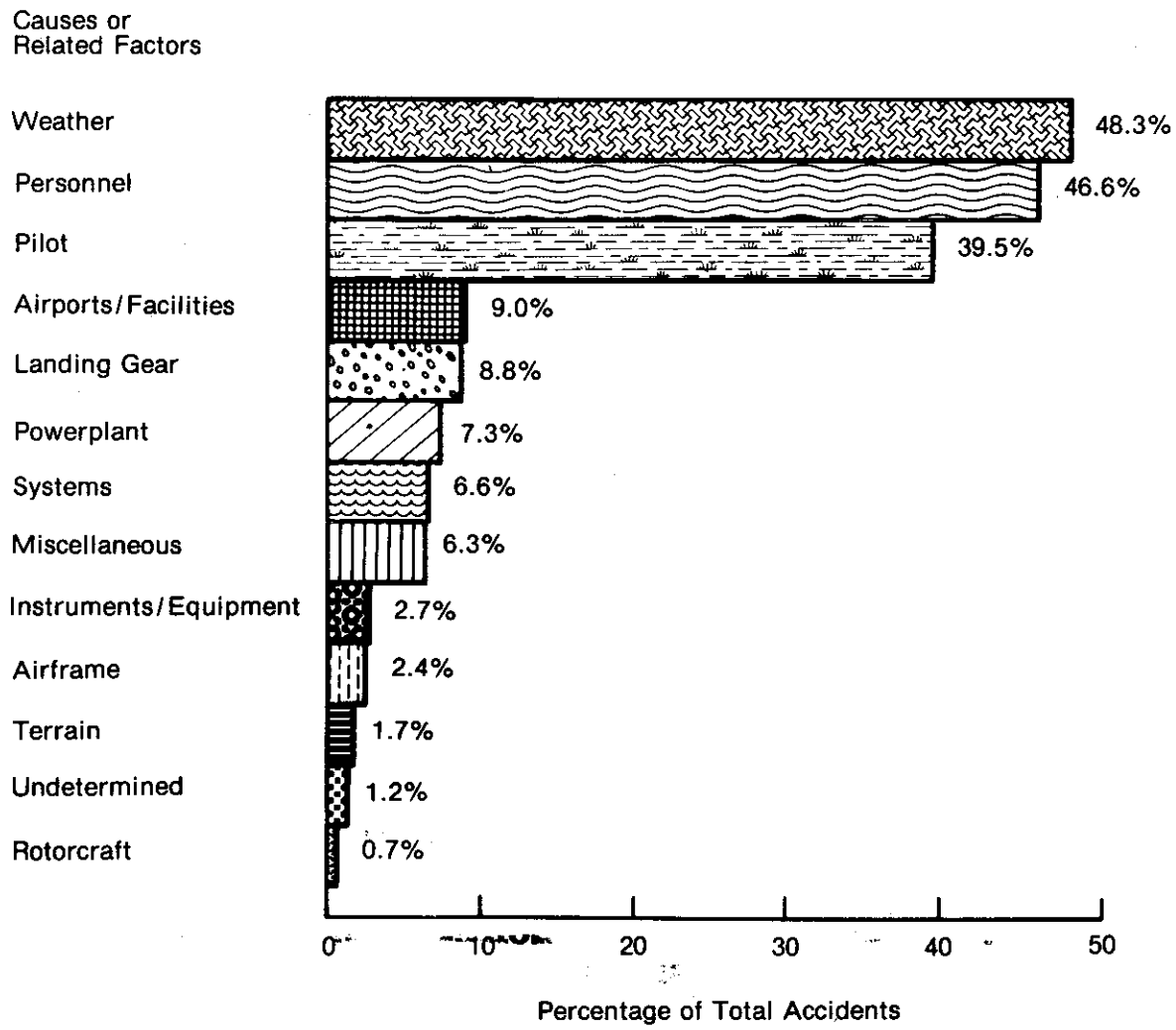
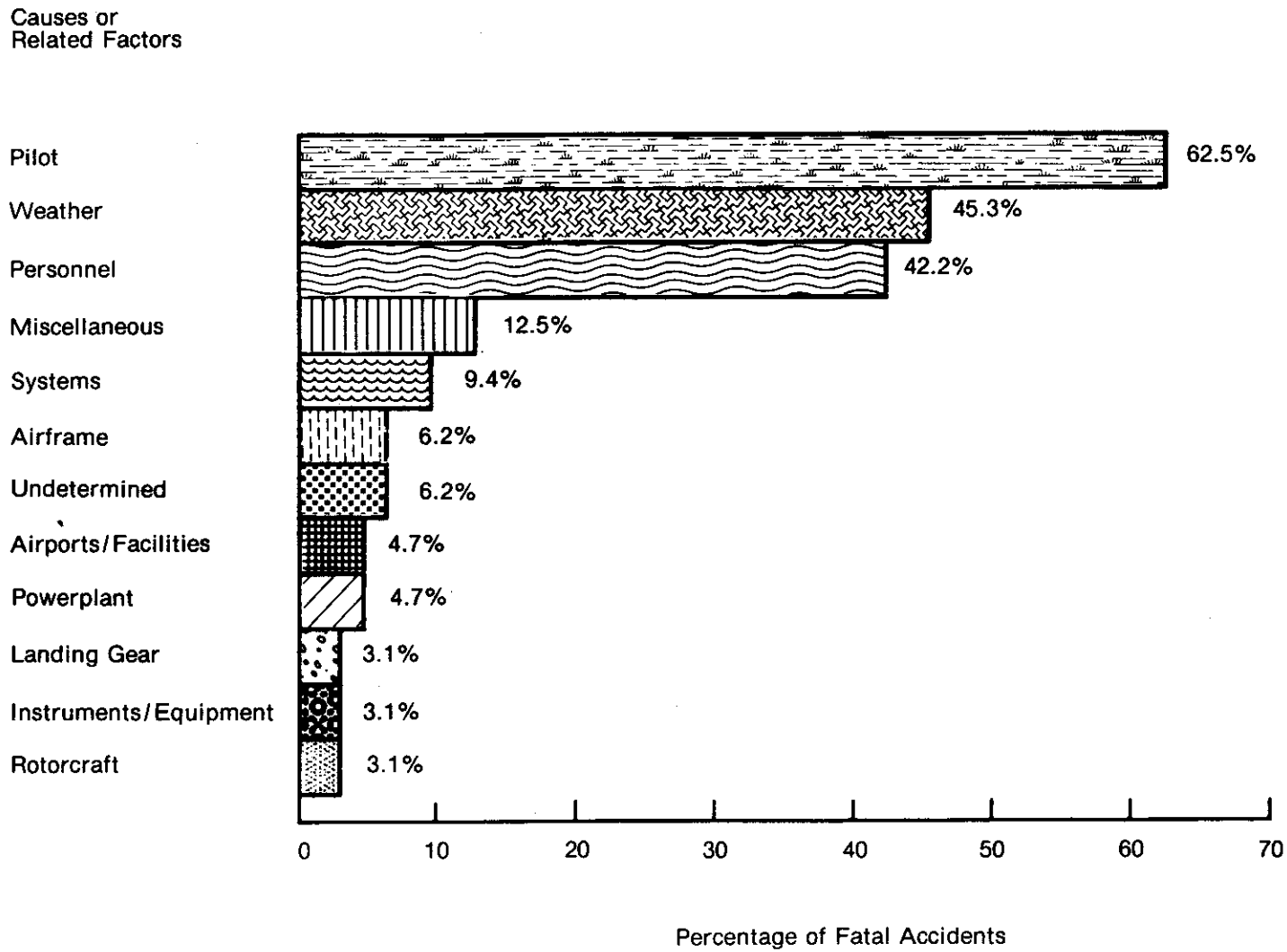


Figure 7
Fatal Accidents
Causes or Related Factors Percentage Distribution
U.S. Certificated Route Air Carriers
1968 Through 1977

Percentage of Total Accidents

Figure 7
Fatal Accidents
Causes or Related Factors Percentage Distribution
U.S. Certificated Route Air Carriers
1968 Through 1977



Scheduled vs. Nonscheduled Service

The collision on the ground between two B-747 aircraft at Tenerife, Canary Islands, on March 27, 1977, was the most tragic accident in the history of U.S. civil aviation. There were 575 fatalities in this one accident, 327 from the Pam American aircraft and all 248 aboard the KLM aircraft. The Pan American aircraft was on a nonscheduled charter flight. The following discussion is a comparison between scheduled service and nonscheduled revenue service of the U.S. certificated route air carriers for the 10-year period, 1968 through 1977.

Total accidents, fatal accidents, and fatalities per 100,000 aircraft departures are presented in the following table for scheduled and nonscheduled revenue service.

Accident and Fatality Rates
Per 100,000 Departures
U.S. Certificated Route Air Carriers
Scheduled Service and Nonscheduled Revenue Service
1968 through 1977

	Total Accident Rates Per 100,000 Departures		Fatal Accident Rates Per 100,000 Departures		Fatalities Per 100,000 Departures	
Year	Scheduled Service	Nonscheduled Service	Scheduled Service	Nonscheduled Service	Scheduled Service	Nonscheduled Service
1968	1.06	1.94	0.21	0.97	6.5	2.9
1969	0.95	3.84	0.15	0.00	2.8	0.0
1970	0.84	4.40	0.08	1.10	0.2	82.4
1971	0.86	4.64	0.10	0.00	4.0	0.0
1972	0.93	0.00	0.14	0.00	3.7	0.0
1973	0.70	1.19	0.16	0.00	4.3	0.0
1974	0.89	1.32	0.13	0.00	7.9	0.0
1975	0.64	5.54	0.04	0.00	2.6	0.0
1976	0.46	1.14	0.04	1.14	0.8	4.6
1977	0.40	0.92	0.06	0.92	1.6	530.2
Average	0.78	2.30	0.11	0.44	3.4	72.1

The average total and fatal accident rates for nonscheduled revenue service were significantly higher than the average rates for scheduled service at the 0.05 level of significance, i.e., there is a 5-percent risk that the observed differences were not real but caused by random chance alone. This means that on the average a flight conducted in nonscheduled revenue service had a significantly higher risk of being involved in an accident (including a fatal accident) than a flight conducted in scheduled service of the certificated route carriers.

Even though the average fatality rate for nonscheduled revenue service was much larger than that for scheduled service (72.1 compared to 3.4), a significant difference was not detected at the 0.05 level of significance. This was because the variation in the fatality rates for nonscheduled revenue service was large relative to the average rate; for example, the rates ranged from 0 to 530.2.

In nonscheduled revenue service for the 10-year period, 1968 through 1977, there were four fatal accidents. The following is a brief synopsis of each of these accidents.

Anchorage, Alaska. On December 26, 1968, a Pan American Boeing 707 had an uncontrolled collision with the ground/water during takeoff initial climb. The type of operation being conducted was a military contract cargo international operation. All three crewmembers were killed in the accident. The probable cause of the accident was pilot in command - misused or failed to use flaps. Contributing factors were diverted attention from operation of the aircraft, poor crew coordination, and fog.

Huntington, West Virginia. On November 14, 1970, Southern Airways Douglas DC-9 on a domestic passenger charter flight collided with trees during the landing final approach phase of operation. All 70 passengers and 5 crewmembers were killed in this accident. The probable cause of this accident was undetermined.

Near Igiugig, Alaska. On March 7, 1976, a Kodiak Western Airlines Cessna 207 was involved in an uncontrolled collision with the ground/water during the inflight phase of operation. Three passengers and one crewmember lost their lives in this domestic passenger charter flight. The probable cause of the accident was pilot in command - continued VFR flight into adverse weather conditions. Contributing factors were improper in-flight decisions or planning and snow.

Tenerife, Canary Islands. On March 27, 1977, two Boeing 747 aircraft collided while on the ground. As a result, 327 persons aboard the Pan American aircraft were killed and all 248 persons aboard the KLM aircraft were fatally injured. At the time of this report, the accident was under investigation by the Government of Spain, and a formal report had not been released.

FINDINGS

In 1977, the number of U.S. air carrier accidents totaled 26 compared to 28 in 1976. The corresponding accident rate per 100,000 aircraft-hours flown decreased from 0.450 in 1976 to 0.397 in 1977. However, fatal accidents increased from three in 1976 to four in 1977 with a corresponding increase in the fatal accident rate per 100,000 aircraft-hours flown from 0.064 to 0.076. The number of fatalities increased substantially from 45 in 1976 to 656 in 1977. Of the 656 fatalities, 575 occurred in a single accident at Tenerife, Canary Islands, which involved a collision on the ground between two Boeing 747 aircraft.

U.S. certificated route and supplemental air carriers (excludes commercial operators of large aircraft) had an outstanding safety record in terms of total accidents. The 23 total accidents and corresponding accident rate per 100,000 aircraft-hours flown were the lowest recorded in the 29-year period, 1949 through 1977. However, in terms of fatal injuries, 1977 was the worst year in the last 29 years with 653 fatalities. Considering the most recent 10-year period, 1968 through 1977, total accidents ranged from a high of 71 in 1968 to a low of 23 in 1977; fatal accidents ranged from 15 in 1968 to 2 in 1975; fatalities had a high of 653 in 1977 and a low of 42 in 1976.

For the past 10 years, 1968 through 1977, the average total accident rate per 100,000 aircraft-hours flown for the certificated route carriers was 0.71. The aircraft makes and models which had average total rates less than or equal to 0.71 were B-707, B-720, B-727, B-737, DC-9, DC-10, BAC 1-11, and M-404. Similiarly, the aircraft makes and models which had average fatal accident rates less than or equal to the overall average fatal rate (0.11 per 100,000 aircraft-hours flown) were B-747, B-707, B-720, B-727, B-737, DC-8, DC-9, DC-10, BAC 1-11, and YS-11.

In the last 10 years for certificated route carriers the most common accident parameters were:

- Type of accident--turbulence (32 percent),
- phase of operation--in-flight (44.2 percent), and
- cause/factor--weather (48.3 percent).

Similarly, for fatal accidents, the most common accident parameters were:

- Type of accident--collision with ground/water (29.6 percent),
- phase of operation--landing (42.3 percent), and
- cause/factor--pilot (62.5 percent).

For the 10-year period, the average total and fatal accident rates per 100,000 aircraft departures for all scheduled service were compared with the rates for nonscheduled revenue service of the certificated route carriers. It was found that the average total and fatal accident rates for nonscheduled revenue service were significantly higher (0.05 level of significance) than the corresponding rates for scheduled service. This means that the relative risks measured against aircraft departures were greater for the nonscheduled charter operations than for the scheduled operations of the certificated route carriers.

Supplemental air carriers in all operations experienced no fatal accidents in 6 of the past 10 years. For the past 3 consecutive years this segment of air carriers did not have a fatal accident. Passenger operations of the supplemental carriers have had an outstanding accident record in the past 10 years with no fatal accidents in 8 of the 10 years and no fatal accidents for the last 7 years, consecutively.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PHILIP A. HOGUE
Member

/s/ ELWOOD T. DRIVER
Member

September 6, 1978

APPENDIX A

ACCIDENT DATA TABLES

Fatal Accidents, Fatalities
U. S. Air Carriers
All Operations
1977

Date	Location	Oper	Serv	Acft	Acft Damg	Fatalities Psg	Cr	Oth	Tot	Tot Abd	Reported Type of Accident
Certificated Route Air Carriers											
3-27	Santa Cruz De Tenerife Canary Islands	PAWA	Psg(NS-I)	B-747	Dest	318	9	0	327	396	Ground Collision PAWA Taxing and KLM Takeoff Run
		KLM	Psg(NS-I)	B-747	Dest	0	0	248	248	248	
4-4	New Hope, GA	SOU	Psg(S-D)	DC-9	Dest	60	2	8	70	85	Crashed Enroute
5-16	New York, NY	NYA	Psg(S-D)	S/61L	Subst	4	0	1	5	25	Roll over while Idling Rotors
12-18	Kayesville, UT	UAL	Crg(S-D)	DC-8	Dest	0	3	0	3	3	Collided with Mountain
Supplemental Air Carriers											
None											
Commercial Operators of Large Aircraft											
7-6	St. Louis, MO	FLAX	Crg(NS-D)	L-188	Dest	0	3	0	3	3	Crashed During Takeoff
					Total	382	17	257	656	760	

Name of Operator
PAWA - Pan American World Airways
KLM - Royal Dutch Airlines
SOU - Southern Airways
NYA - New York Airways
UAL - United Air Lines
FLAX - Fleming International Airways

ACCIDENTS, ACCIDENT RATES, AND FATALITIES
U. S. AIR CARRIERS
(CERTIFICATED ROUTE, SUPPLEMENTAL, AND
COMMERCIAL OPERATORS OF LARGE AIRCRAFT)
ALL OPERATIONS
1967 - 1977

	ACCIDENTS		FATALITIES						ACCIDENT RATES			
									PER 100,000 AIRCRAFT-HOURS FLOWN		PER MILLION AIRCRAFT-MILES FLOWN	
YEAR	TOTAL	FATAL	PSG	CRW	OTH	TOT	HOURS FLOWN	MILES FLOWN (000)**	TOTAL	FATAL	TOTAL	FATAL
1967	70	12	229	39	18	286	5,868,842	2,179,739	1.193	0.204	0.032	0.006
1968	71	15*	306	37	6	349	6,404,260	2,498,848	1.109	0.203	0.028	0.005
1969	63	10*	132	22	4	158	6,740,199	2,736,596	0.935	0.134	0.023	0.003
1970	55	8	118	24	4	146	6,470,351	2,684,552	0.850	0.124	0.020	0.003
1971	48	8*	174	23	6	203	6,386,662	2,660,731	0.752	0.094	0.018	0.002
1972	50	8	160	17	13	190	6,302,160	2,619,043	0.793	0.127	0.019	0.003
1973	43	9	200	26	1	227	6,504,819	2,646,669	0.661	0.138	0.016	0.003
1974	47	9	421	46	0	467	5,978,480	2,464,295	0.769	0.134	0.019	0.003
1975#	45	3	113	11	0	124	6,040,841	2,477,764	0.745	0.050	0.018	0.001
1976	28	4	39	6	0	45	6,228,487	2,568,113	0.450	0.064	0.011	0.002
1977	26	5	382	17	257	656	6,541,168	2,684,072	0.397	0.076	0.010	0.002

* INCLUDES MIDAIR COLLISION ACCIDENTS NONFATAL TO AIR CARRIER OCCUPANTS--
NUMBER ACCIDENTS EXCLUDED FROM FATAL ACCIDENT RATES (1968-2,1969-1,1971-2).

** NONREVENUE MILES OF THE SUPPLEMENTAL AIR CARRIERS ARE NOT REPORTED.

\# BEGINNING 1975,INCLUDES ACCIDENTS OF COMMERCIAL OPERATORS LARGE AIRCRAFT.

NOTES-SABOTAGE ACCIDENT(9/8/74)IS INCLUDED IN ALL COMPUTATIONS,EXCEPT RATES.

IN 1977,FATALITIES(OTHER)INCLUDES 248 ON AIRCRAFT OF FOREIGN REGISTRY.

ACCIDENTS, ACCIDENT RATES, AND FATALITIES
U. S. CERTIFICATED ROUTE AND SUPPLEMENTAL AIR CARRIERS
ALL OPERATIONS
1967 - 1977

ACCIDENT RATES

ACCIDENTS, ACCIDENT RATES, AND FATALITIES
U. S. CERTIFICATED ROUTE AND SUPPLEMENTAL AIR CARRIERS
ALL OPERATIONS
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				HOURS FLOWN	MILES FLOWN (000)**	ACCIDENT RATES: PER 100,000 AIRCRAFT-HOURS FLOWN		ACCIDENT RATES: PER MILLION AIRCRAFT-MILES FLOWN	
	TOTAL	FATAL	PSG	CRW	OTH	TOT			TOTAL	FATAL	TOTAL	FATAL
1967	70	12	229	39	18	286	5,868,842	2,179,739	1.193	0.204	0.032	0.006
1968	71	15*	306	37	6	349	6,404,260	2,498,848	1.109	0.203	0.028	0.005
1969	63	10*	132	22	4	158	6,740,199	2,736,596	0.935	0.134	0.023	0.003
1970	55	8	118	24	4	146	6,470,351	2,684,552	0.850	0.124	0.020	0.003
1971	48	8*	174	23	6	203	6,386,662	2,660,731	0.752	0.094	0.018	0.002
1972	50	8	160	17	13	190	6,302,160	2,619,043	0.793	0.127	0.019	0.003
1973	43	9	200	26	1	227	6,504,819	2,646,669	0.661	0.138	0.016	0.003
1974	47	9	421	46	0	467	5,978,480	2,464,295	0.769	0.134	0.019	0.003
1975	38	2	113	9	0	122	5,876,841	2,422,901	0.647	0.034	0.016	0.001
1976	26	3	39	3	0	42	6,059,987	2,511,053	0.429	0.050	0.010	0.001
1977	23	4	382	14	257	653	6,356,068	2,623,779	0.362	0.063	0.009	0.002

* INCLUDES MIDAIR COLLISIONS NONFATAL TO AIR CARRIER OCCUPANTS, EXCLUDED IN FATAL ACCIDENT RATES (1968--2, 1969--1, 1971--2).

** NONREVENUE MILES OF THE SUPPLEMENTAL AIR CARRIERS ARE NOT REPORTED.

NOTE--SABOTAGE ACCIDENT OCCURRING 9/8/74 IS INCLUDED IN ALL COMPUTATIONS EXCEPT RATES.

IN 1977, FATALITIES(OTHER) INCLUDES 248 ON AIRCRAFT OF FOREIGN REGISTRY.

ACCIDENTS, ACCIDENT RATES AND FATALITIES
U. S. CERTIFICATED ROUTE CARRIERS
(ALL OPERATIONS)
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				AIRCRAFT-MILES FLOWN (000)	ACCIDENT RATE PER MILLION AIRCRAFT-MILES FLOWN	
	TOTAL	FATAL	PASG	CREW	OTH	TOT		TOTAL ACCIDENTS	FATAL ACCIDENTS
1967	66	11	229	36	18	283	2,083,668	0.032	0.005
1968	62	14*	305	37	6	348	2,385,309	0.026	0.005
1969	61	10*	132	22	4	158	2,620,803	0.023	0.003
1970	49	5	72	9	4	85	2,591,706	0.019	0.002
1971	47	8*	174	23	6	203	2,557,968	0.018	0.002
1972	48	8	160	17	13	190	2,526,021	0.019	0.003
1973	40	8	197	23	1	221	2,555,732	0.016	0.003
1974	45	8	420	43	0	463	2,384,933	0.018	0.003
1975	36	2	113	9	0	122	2,357,425	0.015	0.001
1976	25	3	39	3	0	42	2,448,413	0.010	0.001
1977	21	4	382	14	257	653	2,556,080	0.008	0.002

* INCLUDES MIDAIR COLLISION ACCIDENTS NONFATAL TO AIR CARRIER OCCUPANTS--
NUMBER ACCIDENTS EXCLUDED FROM FATAL ACCIDENT RATES (1968-2,1969-1,1971-2).

NOTES-SABOTAGE ACCIDENT(9/8/74)IS INCLUDED IN ALL COMPUTATIONS,EXCEPT RATES.

IN 1977,FATALITIES(OTHER)INCLUDES 248 ON AIRCRAFT OF FOREIGN REGISTRY.

ACCIDENTS, ACCIDENT RATES
CERTIFICATED ROUTE AIR CARRIERS
ALL SCHEDULED SERVICE
1967 - 1977

YEAR	ACCIDENTS		AIRCRAFT-MILES FLOWN (000)	AIRCRAFT-HOURS FLOWN	DEPARTURES	ACCIDENT RATES					
						PER MILLION AIRCRAFT-MILES		PER 100,000 AIRCRAFT-HOURS		PER 100,000 DEPARTURES	
	TOTAL	FATAL				TOTAL ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	FATAL ACCIDENTS
1967	54	8	1,833,563	4,924,080	4,945,969	0.029	0.004	1.097	0.162	1.092	0.162
1968	56	13*	2,146,038	5,521,931	5,299,987	0.026	0.005	1.014	0.199	1.057	0.208
1969	51	8	2,385,082	5,892,254	5,377,302	0.021	0.003	0.866	0.136	0.948	0.149
1970	43	4	2,417,550	5,780,503	5,100,201	0.018	0.002	0.744	0.069	0.843	0.078
1971	43	7*	2,380,664	5,706,270	4,999,093	0.018	0.002	0.754	0.088	0.860	0.100
1972	46	7	2,347,864	5,659,485	4,966,256	0.020	0.003	0.813	0.124	0.926	0.141
1973	36	8	2,448,114	5,898,575	5,133,816	0.015	0.003	0.610	0.136	0.701	0.156
1974	43	7	2,258,136	5,474,495	4,725,783	0.019	0.003	0.767	0.110	0.889	0.127
1975	30	2	2,240,505	5,422,665	4,704,052	0.013	0.001	0.553	0.037	0.638	0.043
1976	22	2	2,319,967	5,587,601	4,835,138	0.009	0.001	0.394	0.036	0.455	0.041
1977	20	3	2,418,652	5,800,843	4,934,094	0.008	0.001	0.345	0.052	0.405	0.061

* INCLUDES 2 MIDAIR COLLISIONS NONFATAL TO AIR CARRIER OCCUPANTS, EXCLUDED IN FATAL ACCIDENT RATES.

NOTE--SABOTAGE ACCIDENT OCCURRING 9/8/74 IS INCLUDED IN ALL COMPUTATIONS EXCEPT RATES.

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED DOMESTIC AND INTERNATIONAL PASSENGER SERVICE
1967 - 1977

YEAR	ACCIDENTS TOTAL	ACCIDENTS FATAL	FATALITIES PASG	FATALITIES CREW	FATALITIES OTH	FATALITIES TOT	PASSENGERS CARRIED	PASSENGER-MILES FLOWN (000)	PASG FATALITY RATE PER 100 MILLION PASSENGER-MILES FLOWN
1967	51	8	226	24	5	255	132,088,038	103,381,996	0.219
1968	53	13*	305	34	6	345	150,162,701	119,612,578	0.255
1969	48	7	132	17	3	152	159,213,414	132,161,593	0.100
1970	39	2	2	0	1	3	171,697,097	139,157,806	0.001
1971	41	6*	174	14	6	194	173,664,737	145,678,876	0.119
1972	43	7	160	13	13	186	188,938,932	159,722,015	0.100
1973	32	6	197	20	0	217	202,207,000	171,436,549	0.115
1974	42	7	420	40	0	460	207,449,006	173,349,894	0.197
1975	28	2	113	9	0	122	205,059,571	174,173,138	0.065
1976	21	2	36	2	0	38	223,313,131	190,915,721	0.019
1977	17	2	64	2	9	75	240,326,516	206,205,410	0.031

* INCLUDES 2 MIDAIR COLLISIONS NONFATAL TO AIR CARRIER OCCUPANTS.

NOTE--PASSENGER DEATHS OCCURRING IN SABOTAGE ACCIDENTS ARE INCLUDED IN THE PASSENGER FATALITY COLUMN BUT EXCLUDED IN THE COMPUTATION OF PASSENGER FATALITY RATES(1974--79).

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED DOMESTIC PASSENGER SERVICE
1967 - 1977

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED DOMESTIC PASSENGER SERVICE
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				PASSENGERS CARRIED	PASSENGER-MILES FLOWN (000)	PASG FATALITY RATE PER 100 MILLION PASSENGER-MILES FLOWN
	TOTAL	FATAL	PASG	CREW	OTH	TOT			
1967	43	8	226	24	5	255	118,663,542	78,911,773	0.286
1968	42	11*	258	24	6	288	134,434,632	91,668,180	0.281
1969	36	7	132	17	3	152	142,364,035	100,815,837	0.131
1970	32	1	0	0	1	1	155,097,644	109,183,837	0
1971	33	6*	174	14	6	194	156,097,403	113,240,603	0.154
1972	37	6	160	13	12	185	169,931,415	123,775,960	0.129
1973	27	4	128	10	0	138	183,271,000	133,733,181	0.096
1974	31	3	158	10	0	168	189,723,697	137,657,951	0.115
1975	21	2	113	9	0	122	188,743,983	140,299,953	0.081
1976	17	1	1	0	0	1	206,274,000	154,322,683	0.001
1977	15	2	64	2	9	75	222,283,516	166,424,934	0.038

* INCLUDES 2 MIDAIR COLLISIONS NONFATAL TO AIR CARRIER OCCUPANTS.

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. CERTIFICATED ROUTE AIR CARRIERS
SCHEDULED INTERNATIONAL PASSENGER SERVICE
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				PASSENGERS CARRIED	PASSENGER-MILES FLOWN (000)	PASG FATALITY RATE PER 100 MILLION PASSENGER-MILES FLOWN
	TOTAL	FATAL	PASG	CREW	OTH	TOT			
1967	8	0	0	0	0	0	13,424,496	24,470,223	0
1968	11	2	47	10	0	57	15,728,069	27,944,398	0.168
1969	12	0	0	0	0	0	16,849,379	31,345,756	0
1970	7	1	2	0	0	2	16,599,453	29,973,969	0.007
1971	8	0	0	0	0	0	17,567,334	32,438,273	0
1972	6	1	0	0	1	1	19,007,517	35,946,055	0
1973	5	2	69	10	0	79	18,936,000	37,703,368	0.183
1974	12	4	262	30	0	292	17,725,309	35,691,093	0.513
1975	7	0	0	0	0	0	16,315,588	33,873,185	0
1976	4	1	35	2	0	37	17,039,131	36,593,038	0.096
1977	3	0	0	0	0	0	18,043,000	39,780,476	0

NOTE--PASSENGER DEATHS OCCURRING IN SABOTAGE ACCIDENTS ARE INCLUDED IN PASSENGER FATALITY COLUMN BUT EXCLUDED IN THE COMPUTATION OF PASSENGER FATALITY RATES (1974--79).

ACCIDENTS, ACCIDENT RATES AND FATALITIES
U. S. SUPPLEMENTAL AIR CARRIERS
(ALL OPERATIONS)

OF PASSENGER FATALITY RATES (1974--79).

ACCIDENTS, ACCIDENT RATES AND FATALITIES
U. S. SUPPLEMENTAL AIR CARRIERS
(ALL OPERATIONS)
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				AIRCRAFT MILES FLOWN (000)	ACCIDENT RATE PER MILLION AIRCRAFT-MILES FLOWN	
	TOTAL	FATAL	PASG	CREW	OTH	TOT		TOTAL ACCIDENTS	FATAL ACCIDENTS
1967	4	1	0	3	0	3	96,071*	0.042	0.010
1968	9	1	1	0	0	1	113,540*	0.079	0.009
1969	2	0	0	0	0	0	115,793*	0.017	0
1970	6	3	46	15	0	61	92,846*	0.065	0.032
1971	1	0	0	0	0	0	102,763*	0.010	0
1972	2	0	0	0	0	0	93,022*	0.022	0
1973	3	1	3	3	0	6	90,937*	0.033	0.011
1974	2	1	1	3	0	4	79,363*	0.025	0.013
1975	2	0	0	0	0	0	65,476*	0.031	0
1976	1	0	0	0	0	0	62,640*	0.016	0
1977	2	0	0	0	0	0	67,699*	0.030	0

* NONREVENUE MILES NOT REPORTED.

ACCIDENTS, FATALITIES, FATALITY RATES
U. S. SUPPLEMENTAL AIR CARRIERS
PASSENGER OPERATIONS (CIVIL AND MILITARY)
1967 - 1977

YEAR	ACCIDENTS		FATALITIES				PASSENGERS CARRIED	PASSENGER-MILES FLOWN (000)	PASG FATALITY RATE PER 100 MILLION PASSENGER-MILES FLOWN
	TOTAL	FATAL	PASG	CREW	OTH	TOT			
1967	0	0	0	0	0	0	2,315,820	5,995,901	0
1968	3	1	1	0	0	1	2,669,466	8,885,783	0.011
1969	0	0	0	0	0	0	3,705,975	11,134,706	0
1970	2	1	46	1	0	47	2,950,224	10,288,728	0.447
1971	0	0	0	0	0	0	3,295,803	10,573,646	0
1972	0	0	0	0	0	0	3,473,599	10,049,683	0
1973	1	0	0	0	0	0	3,569,912	11,790,513	0
1974	1	0	0	0	0	0	3,194,463	10,862,449	0
1975	1	0	0	0	0	0	2,352,423	8,759,279	0
1976	1	0	0	0	0	0	2,191,661	8,199,053	0
1977	2	0	0	0	0	0	2,793,761	9,983,404	0

ACCIDENT RATES
CERTIFICATED ROUTE, SUPPLEMENTAL, AND
COMMERCIAL OPERATORS OF LARGE AIRCRAFT
ALL OPERATIONS
1977

	Accident Rates	
Aircraft- Aircraft-	Per Million Miles	Per 100,000 Hours

ACCIDENT RATES
CERTIFICATED ROUTE, SUPPLEMENTAL, AND
COMMERCIAL OPERATORS OF LARGE AIRCRAFT
ALL OPERATIONS
1977

Class of Carrier	Injury Index: Total	Injury Index: Fatal	Injury Index: Serious	Injury Index: Minor/None	Aircraft Damage: Destroyed	Aircraft Damage: Substantial	Aircraft-Miles Flown(000)	Aircraft-Hours Flown	Accident Rates Per Million Miles: Total Accidents	Accident Rates Per Million Miles: Fatal Accidents	Accident Rates Per 100,000 Hours: Total Accidents	Accident Rates Per 100,000 Hours: Fatal Accidents
CERTIFICATED ROUTE AIR CARRIERS												
1. Domestic Carriers												
Trunk	10	1	6	3 1/	1	3 1/	1,811,308	4,165,534	.006	.001	.240	.024
Local Service	4	1	1	2	1	2	308,769	1,008,871	.013	.003	.396	.099
Helicopter	1	1	0	0	0	1	491	4,716	2.037	2.037	21.204	21.204
All Cargo	0	0	0	0	0	0	17,098	37,342	.000	.000	.000	.000
Other	0	0	0	0	0	0	2,175	9,990	.000	.000	.000	.000
Regional	1	0	1	0	0	0	6,571	40,724	.152	.000	2.456	.000
Intra-Alaska	1	0	0	1	0	1	24,993	98,548	.040	.000	1.015	.000
Intra-Hawaii	0	0	0	0	0	0	12,576	39,577	.000	.000	.000	.000
TOTAL DOMESTIC	17	3	8	6	2	7	2,183,981	5,405,302	.008	.001	.314	.056
2. International Carriers												
Passenger/Cargo	5	1	2	2 1/	1	2 1/	339,308	698,246	.015	.003	.716	.143
All Cargo	0	0	0	0	0	0	32,791	67,522	.000	.000	.000	.000
TOTAL INTERNATIONAL	5	1	2	2	1	2	372,099	765,768	.013	.003	.653	.131
TOTAL CERTIFICATED ROUTE CARRIERS	21	4	10	7	3	8	2,556,080	6,171,070	.008	.002	.340	.065
SUPPLEMENTAL AIR CARRIERS												
1. Domestic Carriers												
Civil Operations	0	0	0	0	0	0	10,582	N/A	.000	.000	.000	.000
Military Contract	0	0	0	0	0	0	13,355	N/A	.000	.000	.000	.000
Subtotal	0	0	0	0	0	0	23,937	77,735	.000	.000	.000	.000
2. International Carriers												
Civil Operations	2	0	2	0	0	1	35,854	N/A	.056	.000	--	.000
Military Contract	0	0	0	0	0	0	7,908	N/A	.000	.000	.000	.000
Subtotal	2	0	2	0	0	1	43,762	107,263	.046	.000	1.865	.000
TOTAL SUPPLEMENTAL AIR CARRIERS	2	0	2	0	0	1	67,699 2/	184,998	.030	.000	1.081	.000
TOTAL COMMERCIAL OPERATORS	3	1	2	0	1	0	60,293	185,100	.050	.017	1.621	.540
GRAND TOTAL ALL OPERATIONS	26	5	14	7	4	9	2,604,072	6,541,168	.010	.002	.397	.076

1/ Collision between different classes of carriers counted as one accident in the totals.

2/ Nonrevenue miles of the supplemental carriers not reported.

ACCIDENT RATES
CERTIFICATED ROUTE AIR CARRIERS
ALL REVENUE OPERATIONS
1977

	Injury Index							ACCIDENT RATES					
								Total Accidents			Fatal Accidents		
	Total	Fatal	Serious	Minor/ None	Aircraft-Miles Flown(000)	Aircraft-Hours Flown	Number of Departures	1 Million Miles	100,000 Hours	100,000 Departures	1 Million Miles	100,000 Hours	100,000 Departures
SCHEDULED SERVICE													
1. Domestic Carriers													
Trunk	10	1	6	3[1/]	1,755,550	4,041,999	2,966,175	.006	.247	.337	.001	.025	.034
Local Service	4	1	1	2	292,743	919,353	1,427,129	.014	.435	.280	.003	.109	.070
Helicopter	1	1	0	0	468	4,464	35,283	2.137	22.401	2.834	2.137	22.401	2.834
All Cargo	0	0	0	0	16,145	35,293	15,720	.000	.000	.000	.000	.000	.000
Other	0	0	0	0	1,036	5,322	9,752	.000	.000	.000	.000	.000	.000
Regional	1	0	1	0	6,323	38,843	72,443	.158	2.574	1.380	.000	.000	.000
Intra-Alaska	1	0	0	1	21,916	79,841	104,426	.046	1.252	.958	.000	.000	.000
Intra-Hawaii	0	0	0	0	9,624	29,723	79,531	.000	.000	.000	.000	.000	.000
TOTAL DOMESTIC	17	3	8	6	2,103,805	5,154,838	4,710,459	.008	.330	.361	.001	.058	.064
2. International Carriers													
Passenger/Cargo	4	0	2	2[1/]	295,604	607,222	214,178	.014	.659	1.868	.000	.000	.000
All Cargo	0	0	0	0	19,243	38,783	9,457	.000	.000	.000	.000	.000	.000
TOTAL INTERNATIONAL	4	0	2	2	314,847	646,005	223,635	.013	.619	1.789	.000	.000	.000
TOTAL SCHEDULED SERVICE	20	3	10	7	2,418,652	5,800,843	4,934,094	.008	.345	.405	.001	.052	.061
NONSCHEDULED REVENUE SERVICE													
1. Domestic Carriers													
Trunk	0	0	0	0	39,502	82,761	29,210	.000	.000	.000	.000	.000	.000
Local Service	0	0	0	0	11,960	28,417	19,837	.000	.000	.000	.000	.000	.000
Helicopter	0	0	0	0	5	34	23	.000	.000	.000	.000	.000	.000
All-Cargo	0	0	0	0	840	1,814	389	.000	.000	.000	.000	.000	.000
Other	0	0	0	0	940	3,953	6,007	.000	.000	.000	.000	.000	.000
Regional	0	0	0	0	99	527	605	.000	.000	.000	.000	.000	.000
Intra-Alaska	0	0	0	0	2,292	15,070	21,563	.000	.000	.000	.000	.000	.000
Intra-Hawaii	0	0	0	0	2,572	8,703	8,061	.000	.000	.000	.000	.000	.000
TOTAL DOMESTIC	0	0	0	0	58,210	141,279	85,695	.000	.000	.000	.000	.000	.000
2. International Carriers													
Passenger/Cargo	1	1	0	0	36,576	75,260	16,837	.027	1.329	5.939	.027	1.329	5.939
All Cargo	0	0	0	0	11,665	24,310	5,914	.000	.000	.000	.000	.000	.000
TOTAL INTERNATIONAL	1	1	0	0	48,241	99,570	22,751	.021	1.004	4.395	.021	1.004	4.395
TOTAL NONSCHEDULED SERVICE	1	1	0	0	106,451	240,849	108,446	.009	.415	.922	.009	.415	.922
GRAND TOTAL	21	4	10	7	2,525,103	6,041,692	5,042,540	.008	.348	.416	.002	.066	.079

1/ Collision between different classes of carriers counted as one accident in the totals.

ACCIDENTS, INJURIES, AIRCRAFT DAMAGE
BY TYPE OF OPERATION
U.S. CERTIFICATED ROUTE AND SUPPLEMENTAL AIR CARRIERS
1977

CERTIFICATED ROUTE CARRIERS

SUPPLEMENTAL CARRIERS

ACCIDENTS, INJURIES, AIRCRAFT DAMAGE
BY TYPE OF OPERATION
U.S. CERTIFICATED ROUTE AND SUPPLEMENTAL AIR CARRIERS
1977

	CERTIFICATED ROUTE CARRIERS					SUPPLEMENTAL CARRIERS				
	Scheduled Passenger Service	All Scheduled Service	Nonsched. Revenue Operations	Nonrevenue Operations	Total All Operations	Public Passg./Cargo Operations	Military Contract Operations	Nonrevenue Operations	Total All Operations	GRAND TOTAL
Accident-Injury Index										
Fatal	2	3	1	0	4	0	0	0	0	4
Serious	10	10	0	0	10	2	0	0	2	12
Minor/None	5	7	0	0	7	0	0	0	0	7
Total	17	20	1	0	21	2	0	0	2	23
Aircraft Damage										
Destroyed	1	2	1	0	3	0	0	0	0	3
Substantial	6	8	0	0	8	1	0	0	1	9
Minor/None	10	10	0	0	10	1	0	0	1	11
Total	17	20	1	0	21	2	0	0	2	23
Fatalities										
Captain	1	2	0	0	2	0	0	0	0	2
Copilot	1	2	0	0	2	0	0	0	0	2
Flight Engineer	0	1	0	0	1	0	0	0	0	1
Cabin Attendants	0	0	9	0	9	0	0	0	0	9
Other Crew	0	0	0	0	0	0	0	0	0	0
Passenger	64	64	318	0	382	0	0	0	0	382
Other Aircraft	0	0	248	0	248	0	0	0	0	248
Other Ground	9	9	0	0	9	0	0	0	0	9
Total	75	78	575	0	653	0	0	0	0	653
Serious Injuries										
Captain	0	0	1	0	1	0	0	0	0	1
Copilot	0	0	1	0	1	0	0	0	0	1
Flight Engineer	0	0	1	0	1	0	0	0	0	1
Cabin Attendants	7	7	0	0	7	1	0	0	1	8
Other Crew	0	0	0	0	0	0	0	0	0	0
Passenger	35	35	30	0	65	23	0	0	23	88
Other Aircraft	0	0	0	0	0	0	0	0	0	0
Other Ground	2	2	0	0	2	0	0	0	0	2
Total	44	44	33	0	77	24	0	0	24	101
Minor/No Injury										
Captain	17	19	0	0	19	2	0	0	2	21
Copilot	17	19	0	0	19	2	0	0	2	21
Flight Engineer	12	13	0	0	13	2	0	0	2	15
Cabin Attendants	56	56	4	0	60	11	0	0	11	71
Other Crew	0	0	0	0	0	0	0	0	0	0
Passenger	1032	1032	32	0	1064	319	0	0	319	1383
Other Aircraft	0	0	0	0	0	0	0	0	0	0
Other Ground	2	2	0	0	2	0	0	0	0	2
Total	1136	1141	36	0	1177	336	0	0	336	1513
TOTAL ABOARD	1242	1250	396	0	1646	360	0	0	360	2006

ACCIDENTS, RATES
BY PHASE OF OPERATION
CERTIFICATED ROUTE AIR CARRIERS
ALL REVENUE OPERATIONS
1977

CLASS OF CARRIER	FIRST PHASE OF OPERATION: Inflight Total	Inflight Fatal	Other Than Inflight[1/] Total	Other Than Inflight Fatal	Aircraft Miles Flown(000)	Number of Departures	ACCIDENT RATES: Inflight Phase Per Million Aircraft-Miles Total	Inflight Phase Per Million Aircraft-Miles Fatal	Other Than Inflight Phase Per 100,000 Departures Total	Other Than Inflight Phase Per 100,000 Departures Fatal
SCHEDULED SERVICE										
1. Domestic Carriers										
Trunk	7	1	3[2/]	0	1,755,550	2,966,175	.004	.001	.101	.000
Local Service	2	1	2	0	292,743	1,427,129	.007	.003	.140	.000
Helicopter	0	0	1	1	468	35,283	.000	.000	2.834	2.834
All Cargo	0	0	0	0	16,145	15,720	.000	.000	.000	.000
Other	0	0	0	0	1,036	9,752	.000	.000	.000	.000
Regional	0	0	1	0	6,323	72,443	.000	.000	1.380	.000
Intra-Alaska	0	0	1	0	21,916	104,426	.000	.000	.958	.000
Intra-Hawaii	0	0	0	0	9,624	79,531	.000	.000	.000	.000
TOTAL DOMESTIC	9	2	8	1	2,103,805	4,710,459	.004	.001	.170	.021
2. International Carriers										
Passenger/Cargo	2	0	2[2/]	0	295,604	214,178	.007	.000	.934	.000
All Cargo	0	0	0	0	19,243	9,457	.000	.000	.000	.000
TOTAL INTERNATIONAL	2	0	2	0	314,847	223,635	.006	.000	.894	.000
TOTAL SCHEDULED SERVICE	11	2	9	1	2,418,652	4,934,094	.005	.001	.182	.020
NONSCHEDULED REVENUE SERVICE										
1. Domestic Carriers										
Trunk	0	0	0	0	39,502	29,210	.000	.000	.000	.000
Local Service	0	0	0	0	11,960	19,837	.000	.000	.000	.000
Helicopter	0	0	0	0	5	23	.000	.000	.000	.000
All Cargo	0	0	0	0	840	389	.000	.000	.000	.000
Other	0	0	0	0	940	6,007	.000	.000	.000	.000
Regional	0	0	0	0	99	605	.000	.000	.000	.000
Intra-Alaska	0	0	0	0	2,292	21,563	.000	.000	.000	.000
Intra-Hawaii	0	0	0	0	2,572	8,061	.000	.000	.000	.000
TOTAL DOMESTIC	0	0	0	0	58,210	85,695	.000	.000	.000	.000
2. International Carriers										
Passenger/Cargo	0	0	1	1	36,576	16,837	.000	.000	5.939	5.939
All Cargo	0	0	0	0	11,665	5,914	.000	.000	.000	.000
TOTAL INTERNATIONAL	0	0	1	1	48,241	22,751	.000	.000	4.395	4.395
TOTAL NONSCHEDULED SERVICE	0	0	1	1	106,451	108,446	.000	.000	.922	.922
GRAND TOTAL	11	2	10	2	2,525,103	5,042,540	.004	.001	.198	.040

1/ Includes all static, taxi, takeoff, and landing phases of operation.

2/ Collision between different classes of carriers counted as one accident in the totals.

Collision between different classes of carriers counted as one accident in the totals.

RECORD OF INDIVIDUAL TRUNK CARRIERS
SCHEDULED DOMESTIC PASSENGER SERVICE
1977

Operator	Accidents Total	Accidents Fatal	Fatalities Passg.	Fatalities Crew	Fatalities Others	Revenue Passengers Carried (000)	Passenger Miles[1] (000)	Revenue Plane Miles (000)	Revenue Departures
Trunk									
American Airlines	1	0	0	0	0	22,038	22,692,199	267,456	356,659
Braniff Airways	1	0	0	0	0	8,881	6,310,495	94,901	187,952
Continental Air Lines	1	0	0	0	0	8,063	7,545,578	80,847	137,710
Delta Air Lines	2	0	0	0	0	30,159	19,679,072	225,738	511,601
Eastern Air Lines	2	0	0	0	0	27,839	17,785,791	251,147	507,842
National Airlines	2	0	0	0	0	6,079	5,887,145	68,818	124,086
Northwest Airlines	0	0	0	0	0	9,337	8,510,469	92,299	166,367
Pan American	0	0	0	0	0	831	2,165,938	10,482	6,668
Trans World Airlines	0	0	0	0	0	15,565	17,190,967	211,056	274,949
United Air Lines	0	0	0	0	0	34,384	34,185,140	354,575	534,597
Western Air Lines	0	0	0	0	0	9,055	8,513,470	98,231	157,744
Total	9	0	0	0	0	172,231	150,466,264	1,755,550	2,966,175

1/ Both revenue and nonrevenue.

RECORD OF INDIVIDUAL LOCAL SERVICE AND HELICOPTER CARRIERS

SCHEDULED PASSENGER SERVICE

1977

Operator	Accidents Total	Accidents Fatal	Fatalities Passg.	Fatalities Crew	Fatalities Others	Revenue Passengers Carried(000)	Passenger Miles[1/] (000)	Revenue Plane Miles(000)	Revenue Departures
Local Service									
Allegheny Airlines	2	0	0	0	0	11,653	3,745,369	72,180	304,390
Frontier Airlines	0	0	0	0	0	4,711	1,987,803	41,129	191,046
Hughes Air Corporation	0	0	0	0	0	5,148	2,144,629	39,929	149,127
North Central Airlines	0	0	0	0	0	5,438	1,338,722	31,477	221,917
Ozark Air Lines	0	0	0	0	0	4,053	1,264,754	28,246	153,753
Piedmont Aviation	1	0	0	0	0	4,168	1,278,276	29,642	175,060
Southern Airways	1	1	60	2	8	3,457	1,093,031	26,115	139,611
Texas International Airlines	0	0	0	0	0	3,225	1,212,819	24,025	92,225
Total	4	1	60	2	8	41,853	14,065,403	292,743	1,427,129
Helicopter Service									
New York Airways	1	1	4	0	1	268	5,075	468	35,283
Total	1	1	4	0	1	268	5,075	468	35,283
Regional Carriers									
Air Midwest	1	0	0	0	0	75	18,740	2,281	20,670
Air New England	0	0	0	0	0	468	61,334	4,042	51,773
Total	1	0	0	0	0	543	80,074	6,323	72,443

1/ Both revenue and nonrevenue

RECORD OF INDIVIDUAL INTRA-ALASKA AND INTRA-HAWAII CARRIERS

SCHEDULED PASSENGER SERVICE

1977

Operator	Accidents Total	Accidents Fatal	Fatalities Passg.	Fatalities Crew	Fatalities Others	Revenue Passengers Carried(000)	Passenger Miles[1] (000)	Revenue Plane Miles(000)	Revenue Departures
Alaskan									
Alaska Airlines	0	0	0	0	0	851	722,850	10,683	19,337
Kodiak-Western Alaska Airlines	0	0	0	0	0	23	1,360	651	16,235
Munz Northern Airlines	0	0	0	0	0	2	211	92	1,214
Reeve Aleutian Airways	0	0	0	0	0	51	42,381	1,467	3,499
Wien Air Alaska	0	0	0	0	0	525	218,852	9,023	64,141
Total	0	0	0	0	0	1,452	985,654	21,916	104,426
Hawaiian									
Aloha Airlines	0	0	0	0	0	2,484	343,952	4,371	36,524
Hawaiian Airlines	0	0	0	0	0	3,240	454,640	5,253	43,007
Total	0	0	0	0	0	5,724	798,592	9,624	79,531
Other									
Aspen Airways	0	0	0	0	0	133	16,237	639	5,653
Wright Airlines	0	0	0	0	0	79	7,635	397	4,099
Total	0	0	0	0	0	212	23,872	1,036	9,752

[1] Both revenue and nonrevenue.

RECORD OF U.S. INTERNATIONAL CARRIERS
SCHEDULED PASSENGER SERVICE
1977

Operator	Accidents Total	Accidents Fatal	Fatalities Passg.	Fatalities Crew	Fatalities Others	Revenue Passengers Carried(000)	Passenger Miles[1/] (000)	Revenue Plane Miles(000)	Revenue Departures
American Airlines	1	0	0	0	0	2,257	3,416,784	29,691	24,574
Braniff Airways	1	0	0	0	0	933	1,705,947	19,357	18,118
Continental Air Lines	0	0	0	0	0	185	126,391	2,252	5,365
Delta Air Lines	0	0	0	0	0	394	497,361	4,360	4,410
Eastern Air Lines	0	0	0	0	0	3,743	4,068,942	32,757	38,861
National Airlines	0	0	0	0	0	146	696,574	3,949	893
Northwest Airlines	0	0	0	0	0	1,018	3,035,000	18,973	8,257
Pan American World Airways	1	0	0	0	0	6,816	17,204,111	118,636	84,924
Trans World Airlines	0	0	0	0	0	2,211	8,462,133	59,467	24,805
Western Air Lines	0	0	0	0	0	340	567,233	6,162	3,971
Total	3	0	0	0	0	18,043	39,780,476	295,604	214,178

1/ Both revenue and nonrevenue.

RECORD OF INDIVIDUAL SUPPLEMENTAL AIR CARRIERS
PASSENGER OPERATIONS (CIVIL AND MILITARY)
1977

	CIVILIAN SERVICE							MILITARY CONTRACT OPERATIONS							
Operators	Accidents Total	Accidents Fatal	Passengers Carried	Revenue Passenger-Miles (000)	Revenue 1/ Plane-Miles	Fatalities Passg.	Fatalities Crew	Accidents Total	Accidents Fatal	Passengers Carried	Revenue Passenger-Miles (000)	Revenue 1/ Plane-Miles	Fatalities Passg.	Fatalities Crew	Total 2/ Hours Flown
Capitol Internat'l Airways, Inc.	2	0	694,582	2,083,399	9,959,939	0	0	0	0	30,324	121,969	568,369	0	0	26,919
Evergreen Internat'l Airlines, Inc.	0	0	137,555	144,729	4,266,320	0	0	0	0	22,763	2,066	1,976,831	0	0	17,857
McCullock Internat'l Airlines, Inc.	0	0	15,509	19,813	509,222	0	0	0	0	---	209	4,001	0	0	1,652
Overseas Nat'l Airways, Inc.	0	0	541,943	1,866,244	8,228,638	0	0	0	0	64,976	276,389	1,294,158	0	0	21,673
Rich Internat'l Airways, Inc.	0	0	---	---	245,815	0	0	0	0	---	---	---	0	0	1,417
Trans Internat'l Airlines, Corp.	0	0	579,659	2,294,245	14,636,754	0	0	0	0	129,603	801,144	15,521,928	0	0	89,364
World Airways, Inc.	0	0	471,277	1,943,656	7,844,020	0	0	0	0	105,570	429,541	1,897,886	0	0	23,634
Zantop Internat'l Airlines, Inc.	0	0	---	---	745,090	0	0	0	0	---	---	---	0	0	2,482
TOTAL	2	0	2,440,525	8,352,086	46,435,798	0	0	0	0	353,236	1,631,318	21,263,173	0	0	184,998

1/ Includes miles flown in cargo operations.

2/ Total hours flown in all operations.

FIRST TYPE OF ACCIDENT BY INJURY INDEX
U.S. AIR CARRIERS'
ALL OPERATIONS
1977

FIRST TYPE OF ACCIDENT	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
GROUND-WATER LOOP-SWERVE				1	1	1
DRAGGED WINGTIP POD OR FLOAT						
WHEELS-UP LANDING						
WHEELS-DOWN LANDING IN WATER						
GEAR COLLAPSED	1				1	1
GEAR RETRACTED						
HARD LANDING						
NOSE OVER/DOWN						
ROLL OVER						
OVERSHOOT						
UNDERSHOOT				1	1	1
COLLISION BETWEEN AIRCRAFT						
BOTH IN FLIGHT						
ONE AIRBORNE						
BOTH ON GROUND	1			2	3	2
COLLISION WITH GROUND/WATER						
CONTROLLED	1				1	1
UNCONTROLLED						
COLLIDED WITH						
WIRES/POLES				1	1	1
TREES						
RESIDENCE/S						
BUILDING/S						
FENCE, FENCEPOSTS						
ELECTRONIC TOWERS						
RUNWAY OR APPROACH LIGHTS						
AIRPORT HAZARD						
ANIMALS						
CROP						
FLAGMAN LOADER						
DITCHES						
SNOWBANK						
PARKED AIRCRAFT (UNATTENDED)				2	2	2
AUTOMOBILE						

FIRST
TYPE OF ACC

DIRT BANK
OTHER
BIRD STRIKE
STALL
SPIN
SPIRAL
MUSH
FIRE OR EXP
IN FLIGHT
ON GROUND
AIRFRAME FA
IN FLIGHT
ON GROUND
ENGINE TEAR/
ENGINE FAILL
PROPELLER/RC
PROPELLER
TAIL ROTOR
MAIN ROTOR
PROP ROTOR A
JET INTAKE/E
PROPELLER/JE
TURBULENCE
HAIL DAMAGE
LIGHTNING ST
EVASIVE MANE
UNCONTROLLED
DITCHING
MISSING ACFT
MISCELLANEOUS
UNDETERMINED

RECORDS
ACCIDENTS

INJURY INDEX

FIRST TYPE OF ACCIDENT	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
DIRT BANK						
OTHER				1	1	1
BIRD STRIKE						
STALL						
SPIN						
SPIRAL						
MUSH						
FIRE OR EXPLOSION						
IN FLIGHT						
ON GROUND					1	
AIRFRAME FAILURE						
IN FLIGHT						
ON GROUND						
ENGINE TEARAWAY						
ENGINE FAILURE OR MALFUNCTION	1	1			2	2
PROPELLER/ROTOR FAILURE						
PROPELLER	1				1	1
TAIL ROTOR						
MAIN ROTOR						
PROP ROTOR ACDNT TO PERSON						
JET INTAKE/EXH ACDNT TO PERS						
PROPELLER/JET/ROTOR BLAST						
TURBULENCE		9			9	9
HAIL DAMAGE TO AIRCRAFT						
LIGHTNING STRIKE						
EVASIVE MANEUVER		1			1	1
UNCONTROLLED ALT DEVIATION		1			1	1
DITCHING						
MISSING ACFT NOT RECOVERED						
MISCELLANEOUS/OTHER		2			2	2
UNDETERMINED						
RECORDS	5	14	8		27	
ACCIDENTS	5	14	7			26

FIRST TYPE OF ACCIDENT BY AIRCRAFT DAMAGE
U.S. AIR CARRIERS
ALL OPERATIONS
1977

FIRST TYPE OF ACCIDENT	AIRCRAFT DAMAGE: DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS
GROUND-WATER LOOP-SWERVE		1			1	1
DRAGGED WINGTIP POD OR FLOAT						
WHEELS-UP LANDING						
WHEELS-DOWN LANDING IN WATER						
GEAR COLLAPSED		1			1	1
GEAR RETRACTED						
HARD LANDING						
NOSE OVER/DOWN						
ROLL OVER						
OVERSHOOT						
UNDERSHOOT		1			1	1
COLLISION BETWEEN AIRCRAFT						
BOTH IN FLIGHT						
ONE AIRBORNE						
BOTH ON GROUND	1	2			3	2
COLLISION WITH GROUND/WATER						
CONTROLLED	1				1	1
UNCONTROLLED						
COLLIDED WITH						
WIRES/POLES		1			1	1
TREES						
RESIDENCE/S						
BUILDING/S						
FENCE, FENCEPOSTS						
ELECTRONIC TOWERS						
RUNWAY OR APPROACH LIGHTS						
AIRPORT HAZARD						
ANIMALS						
CROP						
FLAGMAN LOADER						
DITCHES						
SNOWBANK						
PARKED AIRCRAFT (UNATTENDED)		2			2	2
AUTOMOBILE						

FIRST TYPE OF ACCIDENT
DIRT BANK
OTHER
BIRD STRIKE
STALL
SPIN
SPIRAL
MUSH
FIRE OR EXPLOSI
IN FLIGHT
ON GROUND
AIRFRAME FAILUR
IN FLIGHT
ON GROUND
ENGINE TEARAWAY
ENGINE FAILURE
PROPELLER/ROTOR
PROPELLER
TAIL ROTOR
MAIN ROTOR
PROP ROTOR ACON
JET INTAKE/EXH
PROPELLER/JET/R
TURBULENCE
HAIL DAMAGE TO
LIGHTNING STRIKE
EVASIVE MANEUVER
UNCONTROLLED ALT
DITCHING
MISSING ACFT NOT
MISCELLANEOUS/OT
UNDETERMINED
RECORDS
ACCIDENTS

FIRST TYPE OF ACCIDENT	AIRCRAFT DAMAGE: DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS
DIRT BANK						
OTHER		1			1	1
BIRD STRIKE						
STALL						
SPIN						
SPIRAL						
MUSH						
FIRE OR EXPLOSION						
IN FLIGHT						
ON GROUND						
AIRFRAME FAILURE						
IN FLIGHT						
ON GROUND						
ENGINE TEARAWAY						
ENGINE FAILURE OR MALFUNCTION	1		1		2	2
PROPELLER/ROTOR FAILURE						
PROPELLER	1				1	1
TAIL ROTOR						
MAIN ROTOR						
PROP ROTOR ACDNT TO PERSON						
JET INTAKE/EXH ACDNT TO PERS						
PROPELLER/JET/ROTOR BLAST						
TURBULENCE				9	9	9
HAIL DAMAGE TO AIRCRAFT						
LIGHTNING STRIKE						
EVASIVE MANEUVER				1	1	1
UNCONTROLLED ALT DEVIATION				1	1	1
DITCHING						
MISSING ACFT NOT RECOVERED						
MISCELLANEOUS/OTHER		1		1	2	2
UNDETERMINED						
RECORDS	4	10	1	12	27	
ACCIDENTS	4	9	1	12		26

FIRST PHASE OF OPERATION BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

FIRST OPERATIONAL PHASE	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
STATIC						
STARTING ENGINE/S						
IDLING ENGINE/S		1			1	1
ENGINE RUNUP						
IDLING ROTORS	1				1	1
PARKED-ENGINES NOT OPERATING						
OTHER						
TAXI						
TO TAKEOFF	1	1	1		3	3
FROM LANDING			2		2	2
OTHER			2		2	2
GROUND TAXI TO TAKEOFF						
GROUND TAXI FROM LANDING						
GROUND TAXI, OTHER						
AERIAL TAXI TO TAKEOFF						
AERIAL TAXI TO/FROM LANDING						
AERIAL TAXI, OTHER						
TAKEOFF						
RUN		1			1	1
INITIAL CLIMB	1		1		2	2
VERTICAL						
RUNNING (ROTORCRAFT/VTOL-STOL)						
ABORTED (FIXED-WING)						
ABORTED (ROTORCRAFT/VTOL)						
ABORTED (ROTORCRAFT/STOL)						
OTHER						
INFLIGHT						
CLIMB TO CRUISE		1			1	1
NORMAL CRUISE	1	6			7	7
DESCENDING		4			4	4
HOLDING (IFR)	1				1	1
HOVERING						
POWER-ON DESCENT (ROTORCRAFT)						
AUTOROTATIVE DESCENT						

FIRST
OPERATIONAL P

ACROBATICS
BUZZING
UNCONTROLLED I
EMERGENCY DES
LOW PASS
OTHER
EN ROUTE TO T
EN ROUTE TO R
SURVEY FIELD/
STARTING SWAT
SWATH RUN
FLAREOUT FOR
PULLUP FROM S
PROCEDURE TUR
CLEANUP SWATH
MANEUVER TO A
RETURN TO STR
LANDING
TRAFFIC PATTE
FINAL APPROAC
INITIAL APPRO
FINAL APPROAC
LEVEL OFF/TOU
ROLL (FIXED W
ROLL-ON/RUN-O
POWER-ON LANC
POWER-OFF AUT
GO-AROUND (VF
MISSED APPROA
OTHER
UNKNOWN/NOT F

RECORDS
ACCIDENTS

INJURY INDEX

FIRST OPERATIONAL PHASE	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
ACROBATICS						
BUZZING						
UNCONTROLLED DESCENT						
EMERGENCY DESCENT						
LOW PASS						
OTHER						
EN ROUTE TO TREAT CROP						
EN ROUTE TO RELOADING AREA						
SURVEY FIELD/AREA						
STARTING SWATH RUN						
SWATH RUN						
FLAREOUT FOR SWATH RUN						
PULLUP FROM SWATH RUN						
PROCEDURE TURNAROUND						
CLEANUP SWATH						
MANEUVER TO AVOID OBSTRUCTION						
RETURN TO STRIP						
LANDING						
TRAFFIC PATTERN-CIRCLING						
FINAL APPROACH (VFR)			1		1	1
INITIAL APPROACH						
FINAL APPROACH (IFR)						
LEVEL OFF/TOUCHDOWN						
ROLL (FIXED WING)			1		1	1
ROLL-ON/RUN-ON (ROTORCRAFT)						
POWER-ON LANDING (ROTORCRAFT)						
POWER-OFF AUTOROTATIVE LDG						
GO-AROUND (VFR)						
MISSED APPROACH (IFR)						
OTHER						
UNKNOWN/NOT REPORTED						
RECORDS	5	14	8		27	
ACCIDENTS	5	14	7			26

FIRST PHASE OF OPERATION BY AIRCRAFT DAMAGE
U.S. AIR CARRIERS
ALL OPERATIONS
1977

FIRST OPERATIONAL PHASE	AIRCRAFT DAMAGE: DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS
STATIC						
STARTING ENGINE/S					1	1
IDLING ENGINE/S				1		
ENGINE RUNUP					1	1
IDLING ROTORS		1				
PARKED-ENGINES NOT OPERATING						
OTHER						
TAXI					3	3
TO TAKEOFF	1	2			2	2
FROM LANDING		2			2	2
OTHER		2				
GROUND TAXI TO TAKEOFF						
GROUND TAXI FROM LANDING						
GROUND TAXI, OTHER						
AERIAL TAXI TO TAKEOFF						
AERIAL TAXI TO/FROM LANDING						
AERIAL TAXI, OTHER						
TAKEOFF					1	1
RUN			1		2	2
INITIAL CLIMB	1	1				
VERTICAL						
RUNNING (ROTORCRAFT/VTOL-STOL)						
ABORTED (FIXED-WING)						
ABORTED (ROTORCRAFT/VTOL)						
ABORTED (ROTORCRAFT/STOL)						
OTHER						
INFLIGHT					1	1
CLIMB TO CRUISE				1	7	7
NORMAL CRUISE	1			6	4	4
DESCENDING				4	1	1
HOLDING (IFR)	1					
HOVERING						
POWER-ON DESCENT (ROTORCRAFT)						
AUTOROTATIVE DESCENT						

FIRST
OPERATIONAL PI

ACROBATICS
BUZZING
UNCONTROLLED DE
EMERGENCY DESCE
LOW PASS
OTHER
EN ROUTE TO TRE
EN ROUTE TO REI
SURVEY FIELD/A
STARTING SWATH
SWATH RUN
FLAREOUT FOR S
PULLUP FROM SW
PROCEDURE TURN
CLEANUP SWATH
MANEUVER TO AV
RETURN TO STRI
LANDING
TRAFFIC PATTER
FINAL APPROACH
INITIAL APPRO
FINAL APPROACH
LEVEL OFF/TOU
ROLL (FIXED W
ROLL-ON/RUN-O
POWER-ON LAND
POWER-OFF AUT
GO-AROUND (VF
MISSED APPROA
OTHER
UNKNOWN/NOT R

RECORDS
ACCIDENTS

FIRST OPERATIONAL PHASE	AIRCRAFT DAMAGE: DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS
AGROBATICS						
BUZZING						
UNCONTROLLED DESCENT						
EMERGENCY DESCENT						
LOW PASS						
OTHER						
EN ROUTE TO TREAT CROP						
EN ROUTE TO RELOADING AREA						
SURVEY FIELD/AREA						
STARTING SWATH RUN						
SWATH RUN						
FLAREOUT FOR SWATH RUN						
PULLUP FROM SWATH RUN						
PROCEDURE TURNAROUND						
CLEANUP SWATH						
MANEUVER TO AVOID OBSTRUCTION						
RETURN TO STRIP						
LANDING						
TRAFFIC PATTERN-CIRCLING						
FINAL APPROACH (VFR)		1			1	1
INITIAL APPROACH						
FINAL APPROACH (IFR)						
LEVEL OFF/TOUCHDOWN						
ROLL (FIXED WING)		1			1	1
ROLL-ON/RUN-ON (ROTORCRAFT)						
POWER-ON LANDING (ROTORCRAFT)						
POWER-OFF AUTOROTATIVE LDG						
GO-AROUND (VFR)						
MISSED APPROACH (IFR)						
OTHER						
UNKNOWN/NOT REPORTED						
RECORDS	4	10	1	12	27	
ACCIDENTS	4	9	1	12		26

TYPE OF OPERATION BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

TYPE OF OPERATION	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
SCHEDULED DOMESTIC PASSG.SVC	2	9		5	16	16
SCHEDULED INTL PASSG SERVICE		2		1	3	3
SCHEDULED DOMESTIC CARGO SVC	1			1	2	2
SCHEDULED INTL CARGO SERVICE				1	1	1
CHARTER-PASSENGER-DOMESTIC						
CHARTER-CARGO-DOMESTIC	1	1			2	2
MIL CONTRACT-PASSG-DOMESTIC						
MIL CONTRACT-CARGO-DOMESTIC						
TEST						
TRAINING						
FERRY-DOMESTIC						
COMPANY FLIGHT						
CHARTER-PASSG-INTL	1	2			3	3
CHARTER-CARGO-INTL						
MIL CONTRACT-PASSG-INTL						
MIL CONTRACT-CARGO-INTL						
FERRY-INTERNATIONAL						
OTHER						
RECORDS	5	14		8	27	
ACCIDENTS	5	14		7		26

CONDITIONS

DAWN
DAYLIGHT
DUSK
NIGHT (DARK
NIGHT (MOON
UNKNOWN/NOT

RECORDS
ACCIDENTS

TYPE OF POWE

RECIPROCATI
TURBOJET EN
TURBOPROP E
TURBOFAN EN
NONE
TURBOSHAFT

RECORDS
ACCIDENTS

CONDITIONS OF LIGHT BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

CONDITIONS OF LIGHT	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
DAWN						
DAYLIGHT	3	8	4		15	15
DUSK						
NIGHT (DARK)	2	5	4		11	10
NIGHT (MOONLIGHT-BRIGHT)						
UNKNOWN/NOT REPORTED		1			1	1
RECORDS	5	14	8		27	
ACCIDENTS	5	14	7			26

TYPE OF POWER BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

TYPE OF POWER	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
RECIPROCATING ENGINE		1			1	1
TURBOJET ENGINE		8	4		12	11
TURBOPROP ENGINE	1	3	2		6	6
TURBOFAN ENGINE	3	2	2		7	7
NONE						
TURBOSHAFT	1				1	1
RECORDS	5	14	8		27	
ACCIDENTS	5	14	7			26

AIRPORT PROXIMITY BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

AIRPORT PROXIMITY	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
ON AIRPORT	2	3		8	13	12
ON SEAPLANE BASE						
ON HELIPORT	1				1	1
ON BARGE/SHIP/PLATFORM						
IN TRAFFIC PATTERN						
WITHIN 1/4 MILE						
WITHIN 1/2 MILE						
WITHIN 3/4 MILE						
WITHIN 1 MILE						
WITHIN 2 MILES						
WITHIN 3 MILES						
WITHIN 4 MILES						
WITHIN 5 MILES						
BEYOND 5 MILES	1	11			12	12
UNKNOWN/NOT REPORTED	1				1	1
RECORDS	5	14		8	27	
ACCIDENTS	5	14		7		26

TYPE OF WEATHER CONDITIONS BY INJURY INDEX
U.S. AIR CARRIERS
ALL OPERATIONS
1977

TYPE OF WEATHER CONDITIONS	INJURY INDEX: FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS
VFR	2	8		7	17	16
IFR	2	5		1	8	8
BELOW MINIMUMS						
UNKNOWN/NOT REPORTED	1	1			2	2
RECORDS	5	14		8	27	
ACCIDENTS	5	14		7		26

INVOLVES
INVOLVES

BROAD CAUSE/

PILOT

PERSONNEL

AIRFRAME

LANDING GEAR

POWERPLANT

SYSTEMS

INSTRUMENTS/EC

ROTORCRAFT

AIRPORT/AIRWAY

WEATHER

TERRAIN

MISCELLANEOUS

UNDETERMINED

THE FIG
OF ACCI

* IE. AN A
CATEGOR

CAUSE/FACTOR TABLE

U.S. AIR CARRIERS
ALL OPERATIONS
1977
EXCLUDES 3 ACCIDENTS WITH NO CAUSAL ASSIGNMENTS

INVOLVES 23 TOTAL ACCIDENTS

INVOLVES 4 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	2 50.00	1 25.00	3 75.00	8 42.11	.00	8 42.11	10 43.48	1 4.35	11 47.83
PERSONNEL	2 50.00	1 25.00	3 75.00	14 73.68	1 5.26	15 78.95	16 69.57	2 8.70	18 78.26
AIRFRAME	.00	.00	.00	.00	.00	.00	.00	.00	.00
LANDING GEAR	1 25.00	.00	1 25.00	.00	1 5.26	1 5.26	1 4.35	1 4.35	2 8.70
POWERPLANT	2 50.00	.00	2 50.00	1 5.26	1 5.26	2 10.53	3 13.04	1 4.35	4 17.39
SYSTEMS	.00	1 25.00	1 25.00	1 5.26	.00	1 5.26	1 4.35	1 4.35	2 8.70
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	.00	.00	.00	.00	.00	.00
ROTORCRAFT	.00	.00	.00	.00	.00	.00	.00	.00	.00
AIRPORT/AIRWAYS/FACILITIES	.00	.00	.00	.00	3 15.79	3 15.79	.00	3 13.04	3 13.04
WEATHER	1 25.00	.00	1 25.00	9 47.37	3 15.79	11 57.89	10 43.48	3 13.04	12 52.17
TERRAIN	.00	.00	.00	.00	1 5.26	1 5.26	.00	1 4.35	1 4.35
MISCELLANEOUS	.00	.00	.00	1 5.26	.00	1 5.26	1 4.35	.00	1 4.35
UNDETERMINED	.00	.00	.00	.00	.00	.00	.00	.00	.00

THE FIGURES OPPOSITE EACH CAUSAL CATEGORY REPRESENT THE NUMBER AND PERCENT OF ACCIDENTS IN WHICH THAT PARTICULAR CAUSAL CATEGORY WAS ASSIGNED

* IF AN ACCIDENT INCLUDES BOTH A CAUSE AND RELATED FACTOR IN THE SAME CAUSAL CATEGORY, THE ACCIDENT IS REPRESENTED ONCE UNDER THE TOTAL FOR THAT CATEGORY

CAUSE/FACTOR TABLE

U.S. AIR CARRIERS
ALL OPERATIONS
1977
EXCLUDES 3 ACCIDENTS WITH NO CAUSAL ASSIGNMENTS

INVOLVES 23 TOTAL ACCIDENTS

INVOLVES 4 FATAL ACCIDENTS

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
** PILOT **									
PILOT IN COMMAND									
ATTEMPTED OPERATION W/KNOWN DEFICIENCIES IN EQUIPMENT	1		1				1		1
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT				1		1	1		1
FAILED TO SEE AND AVOID OTHER AIRCRAFT				2		2	2		2
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS				1		1	1		1
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC	1		1	2		2	3		3
IMPROPER IFR OPERATION	1		1				1		1
IMPROPER IN-FLIGHT DECISIONS OR PLANNING		1	1					1	1
EXERCISED POOR JUDGMENT	1		1				1		1
INITIATED FLIGHT IN ADVERSE WEATHER CONDITIONS				1		1	1		1
MISJUDGED DISTANCE, SPEED, AND ALTITUDE				1		1	1		1
MISJUDGED CLEARANCE				1		1	1		1
FAILED TO MAINTAIN DIRECTIONAL CONTROL				1		1	1		1
DIRECT ENTRIES				1		1	1		1
SUBTOTAL	4	1	5	11		11	15	1	16
COPILOT									
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES, ETC				1		1	1		1
SUBTOTAL				1		1	1		1
** PERSONNEL **									
FLIGHT INSTRUCTOR									
MAINTENANCE, SERVICING, INSPECTION									
INADEQUATE MAINTENANCE AND INSPECTION	1		1				1		1
OPERATIONAL SUPERVISORY PERSONNEL									
DEFICIENCY, COMPANY MAINTAINED EQMT, SERV, REGULATIONS	1		1				1		1
WEATHER PERSONNEL									
TRAFFIC CONTROL PERSONNEL									
ISSUED IMPROPER OR CONFLICTING INSTRUCTIONS	1		1				1		1
AIRPORT SUPERVISORY PERSONNEL									
IMPROPER MAINTENANCE-AIRPORT FACILITIES					1	1		1	1
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT				3		3	3		3
GROUND CREWMAN				1		1	1		1
PASSENGER				6		6	6		6
OTHER				1	1	2	1	1	2
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
FLIGHT ATTENDANT				5		5	5		5
DISPATCHING (AIR CARRIER ONLY)									
FAILED TO KEEP FLIGHT PROPERLY ADVISED (FLIGHT FOLLOWING		1	1					1	1
SUBTOTAL	3	1	4	16	2	18	19	3	22
** AIRFRAME **									
WINGS									
FUSELAGE									
LANDING GEAR									
MAIN GEAR-SHOCK ABSORBING ASSY, STRUTS, ATTACHMENTS, ETC	1		1				1		1
OTHER					1	1		1	1
FLIGHT CONTROL SURFACES									
SUBTOTAL	1		1		1	1	1	1	2
** POWERPLANT **									

CAUSE/FACTOR TABLE

POWERPLANT (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
ENGINE STRUCTURE									
IGNITION SYSTEM									
FUEL SYSTEM									
LUBRICATING SYSTEM									
COOLING SYSTEM									
PROPELLER AND ACCESSORIES									
EXHAUST SYSTEM									
ENGINE ACCESSORIES									
ENGINE CONTROLS									
POWERPLANT-INSTRUMENTS									
MISCELLANEOUS									
COMPRESSOR STALLS	1		1				1		1
REDUCTION GEAR ASSEMBLY									
COMPRESSOR ASSEMBLY									
DISC, COMPRESSOR ROTOR				1		1	1		1
OTHER	1		1				1		1
COMBUSTION ASSEMBLY									
TURBINE ASSEMBLY									
ACCESSORY DRIVE ASSEMBLY									
LUBRICATING SYSTEM									
FUEL SYSTEM									
SAFETY SYSTEM									
IGNITION SYSTEM									
TORQUEMETER									
AIR BLEED									
EXHAUST SYSTEM									
THRUST REVERSER									
OTHER					1	1		1	1
PROPELLER SYSTEM									
FEATHERING PUMP	1		1				1		1
CONSTANT SPEED DRIVE									
POWER LEVER									
PROPELLER LEVER									
REVERSE THRUST LEVER									
ENGINE INDICATING EQUIPMENT									
ENGINE INSTALLATION									
SUBTOTAL	3		3	1	1	2	4	1	5
** SYSTEMS **									
ELECTRICAL SYSTEM									
OTHER									
HYDRAULIC SYSTEM		1	1					1	1
FLIGHT CONTROL SYSTEMS									
ANTI-ICING, DE-ICING SYSTEMS									
AIR CONDITION, HEATING AND PRESSURIZATION									
AUTO PILOT									
OTHER									
FIRE WARNING SYSTEM				1		1	1		1
FIRE EXTINGUISHER SYSTEM									
OXYGEN SYSTEM									
OTHER SYSTEMS									
SUBTOTAL		1	1	1		1	1	1	2
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
AIRPORT CONDITIONS									
WET RUNWAY					1	1		1	1
SNOW ON RUNWAY					1	1		1	1
POORLY MAINTAINED RUNWAY SURFACE					1	1		1	1
ICE/SLUSH ON RAMP/TAXIWAY					2	2		2	2
SNOW ON RAMP/TAXIWAY					2	2		2	2
AIRWAYS FACILITIES									
SUBTOTAL					7	7		7	7
** WEATHER **									
RAIN									
HAIL					1	1		1	1
UNFAVORABLE WIND CONDITIONS	1		1				1		1
WIND SHEAR					2	2		2	2
TURBULENCE IN FLIGHT, CLEAR AIR				1		1	1		1
				3		3	3		3

CAUSE/FACTOR TABLE

WEATHER (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS CAUSE	FATAL ACCIDENTS FACTOR	FATAL ACCIDENTS TOTAL	NONFATAL ACCIDENTS CAUSE	NONFATAL ACCIDENTS FACTOR	NONFATAL ACCIDENTS TOTAL	ALL ACCIDENTS CAUSE	ALL ACCIDENTS FACTOR	ALL ACCIDENTS TOTAL
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS				5		5	5		5
THUNDERSTORM ACTIVITY	1		1		1	1	1	1	2
SUBTOTAL	2		2	9	4	13	11	4	15
** TERRAIN **									
SNOW-COVERED					1	1		1	1
SUBTOTAL					1	1		1	1
** MISCELLANEOUS **									
EVASIVE MANEUVER TO AVOID COLLISION				1		1	1		1
SUBTOTAL				1		1	1		1
GRAND TOTAL	13	3	16	40	16	56	53	19	72
** MISCELLANEOUS ACTS, CONDITIONS **									
LEAK/LEAKAGE	1		1				1		1
OVERHEATED	1		1				1		1
CONGESTED RAMP/TAXIWAY					1	1		1	1
SEAT BELT SIGN ON					7	7		7	7
SEAT BELT NOT FASTENED				8		8	8		8
ELECTRICAL FAILURE		1	1					1	1
FATIGUE FRACTURE	1		1				1		1
THRUST REVERSAL-UNWANTED	1		1				1		1
PILOT FATIGUE	1		1				1		1
OIL EXHAUSTION-PROPELLER SYSTEM	1		1				1		1
HYDROPLANING ON WET RUNWAY					1	1		1	1

DIRECT ENTRY CAUSES

PILOT-SAW OTR ACFT TOO LATE TO AVOID MANEUVER

DIRECT ENTRY CAUSES ARE CARRIED UNDER THEIR APPROPRIATE CAUSAL CATEGORIES AND ARE INCLUDED IN THE TOTALS

APPENDIX B

LISTING AND BRIEFS OF ACCIDENTS

U.S. AIR CARRIER ACCIDENTS
ALL OPERATIONS
1977

FILE NUMBER	AIRCRAFT REGIST.	DATE	LOCATION	AIRCRAFT MAKE	AIRCRAFT MODEL	INJURY INDEX
1 0001	N8130N	092177	NDAYTONA BEACH,FL	BOEING	727	SERIOUS
1 0002	N4620	012577	JAMAICA,NY	BOEING	727	NONE
1 0002	N7598A	012577	JAMAICA,NY	BOEING	707	NONE
1 0003	N1302L	022177	JAMACIA,NY	DOUGLAS	DC-8	NONE
1 0004	N5812	031877	FLUSHING,NY	CONVAIR	580	NONE
1 0005	N6834	030477	DAYTON,OH	BOEING	727	SERIOUS
1 0006	N247P	021077	SHENANDOAH,VA	NIHON	YS11	SERIOUS
1 0007	N7286	021177	NWACO,TX	BOEING	727	SERIOUS
1 0008	N224AM	020277	PARSONS,KS	SWEARINGEN	SA-226	SERIOUS
1 0009	N2714R	030977	EMMONAK,AK	DEHAVILLAND	DHC-6	NONE
1 0010	N1335U	040477	NEW HOPE,GA	DOUGLAS	DC-9	FATAL
1 0011	N66NA	070677	NLOS ANGELES,CA	DOUGLAS	DC-10	SERIOUS
1 0012	N956VJ	082177	NEW YORK,NY	DOUGLAS	DC-9	NONE
1 0013	N904CL	011677	BALTIMORE,MD	DOUGLAS	DC-8	SERIOUS
1 0014	N815E	080577	NMIAMI,FL	DOUGLAS	DC-8	SERIOUS
1 0015	N515TY	071677	NFT.WAYNE,IN	DOUGLAS	DC-6A	SERIOUS
1 0016	N812BN	080777	NVARADERO,CUBA	DOUGLAS	DC-8	SERIOUS
1 0017	N171PS	072277	NGLENDALE,CA	LOCKHEED	188C	SERIOUS
1 0018	N280F	070677	ST.LOUIS,MO	LOCKHEED	L-188C	FATAL
1 0019	N911CL	100277	SHANNON ARPT,IRLD	DOUGLAS	DC-8	SERIOUS
1 0020	N329	031277	NATLANTA,GA	LOCKHEED	L-1011	SERIOUS
1 0021	N8047U	121877	NKAYSVILLE,UT	DOUGLAS	DC-8F	FATAL

U.S. AIR CARRIER ACCIDENTS
ALL OPERATIONS
1977

FILE NUMBER	AIRCRAFT REGIST.	DATE	LOCATION	AIRCRAFT MAKE	AIRCRAFT MODEL	INJURY INDEX
1 0022	N32725	060377	TUCSON,AZ	BOEING	727	NONE
1 0023	N616US	111777	JAMAICA,NY	BOEING	747F	NONE
1 0024	N329PA	060977	NBERLIN,GERMANY	BOEING	727	SERIOUS
1 0025	N619PA	051677	NEW YORK,NY	SIKORSKY	S-61L	FATAL
1 0026	N736PA	032777	TENERIFE,CANR	BOEING	747	FATAL
1 0026	PH-BUP	032777	TENERIFE,CANR	BOEING	747	FATAL

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D. C. 20594

BRIEFS OF ACCIDENTS

U.S. AIR CARRIERS

ALL OPERATIONS

1977

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0001	9/21/77 TIME - 1445	NR.DAYTONA BEACH,FL	BOEING 727 N8130N DAMAGE-NONE	CR- 0 0 6 PX- 0 1 97	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 54, 21000 TOTAL HOURS, 8800 IN TYPE, INSTRUMENT RATED.

OPERATOR - EASTERN AIR LINES,INC.
DEPARTURE POINT
NEW YORK,NY
INTENDED DESTINATION
FORT LAUDERDALE,FL
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE, ASSOCIATED W/CLOUDS AND/OR THUNDERSTORMS
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON
WEATHER BRIEFING - COMPANY DISPATCH

SKY CONDITION
OVERCAST
VISIBILITY AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
TYPE OF FLIGHT PLAN
IFR
CEILING AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
PRECIPITATION AT ACCIDENT SITE
RAIN
TYPE OF WEATHER CONDITIONS
IFR
REMARKS- PAX STANDING IN AISLE.

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0002	1/25/77 TIME - 2205	JAMAICA,NY	BOEING 727 N4620 DAMAGE-SUBSTANTIAL	CR- 0 0 6 PX- 0 0 38 OT- 0 0 31	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 34, 7968 TOTAL HOURS, 2285 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - J F KENNEDY INTL
OPERATOR - NATIONAL AIRLINES,INC
DEPARTURE POINT
JAMAICA,NY
INTENDED DESTINATION
JAMAICA,NY
LAST ENROUTE STOP
WASHINGTON,DC
TYPE OF ACCIDENT
COLLISION WITH AIRCRAFT BOTH ON GROUND
PHASE OF OPERATION
TAXI FROM LANDING

PROBABLE CAUSE(S)
PILOT IN COMMAND - FAILED TO SEE AND AVOID OTHER AIRCRAFT
PERSONNEL - MISCELLANEOUS-PERSONNEL PILOT OF OTHER AIRCRAFT
FACTOR(S)
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS ICE/SLUSH ON RAMP/TAXIWAY
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS SNOW ON RAMP/TAXIWAY
REMARKS- ACFT CLEARED FOR TAXI.TAXIWAYS ICE/SNOW COVERED.

1-0002	1/25/77 TIME - 2205	JAMAICA,NY	BOEING 707 N7598A DAMAGE-SUBSTANTIAL	CR- 0 0 7 PX- 0 0 24 OT- 0 0 44	SCHED INTERNATL PASSG SRV	AIRLINE TRANSPORT, AGE 52, 19000 TOTAL HOURS, 600 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - J F KENNEDY INTL
OPERATOR - AMERICAN AIRLINES,INC.
DEPARTURE POINT
JAMAICA,NY
INTENDED DESTINATION
TORONTO,CANADA
TYPE OF ACCIDENT
COLLISION WITH AIRCRAFT BOTH ON GROUND
PHASE OF OPERATION
TAXI TO TAKEOFF

PROBABLE CAUSE(S)
PILOT IN COMMAND - FAILED TO SEE AND AVOID OTHER AIRCRAFT
PERSONNEL - MISCELLANEOUS-PERSONNEL PILOT OF OTHER AIRCRAFT
FACTOR(S)
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS ICE/SLUSH ON RAMP/TAXIWAY
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS SNOW ON RAMP/TAXIWAY
REMARKS- ACFT CLEARED FOR TAXI.TAXIWAYS ICE/SNOW COVERED.

1-0003	2/21/77 TIME - 2100	JAMACIA,NY	DOUGLAS DC-8 N1302L DAMAGE-SUBSTANTIAL	CR- 0 0 8 PX- 0 0 89	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - JF KENNEDY INTL
OPERATOR - DELTA AIR LINES,INC.
DEPARTURE POINT
JAMACIA,NY
INTENDED DESTINATION
ATLANTA,GA
TYPE OF ACCIDENT
COLLIDED WITH PARKED AIRCRAFT
PHASE OF OPERATION
TAXI OTHER

PROBABLE CAUSE(S)
PERSONNEL - MISCELLANEOUS-PERSONNEL OTHER
REMARKS- DRG PUSHBACK FRM GATE HIT STOPPED 747SP,N533PA,IN PROCESS OF BEING MOVED TO MAINT HANGAR.

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0004	3/18/77 TIME - 0907	FLUSHING,NY	CONVAIR 580 N5812 DAMAGE-SUBSTANTIAL	CR- 0 0 3 PX- 0 0 47	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 45, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - LAGUARDIA
OPERATOR - ALLEGHENY AIRLINES,INC.
DEPARTURE POINT
ITHACA,NY
INTENDED DESTINATION
FLUSHING,NY
TYPE OF ACCIDENT
COLLIDED WITH PARKED AIRCRAFT
PHASE OF OPERATION
TAXI FROM LANDING

PROBABLE CAUSE(S)
PILOT IN COMMAND - FAILED TO FOLLOW APPROVED PROCEDURES,DIRECTIVES,ETC.
PILOT IN COMMAND - MISJUDGED CLEARANCE
PILOT IN COMMAND - DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - CONGESTED RAMP/TAXIWAY
REMARKS- PLT ATTN DIVERTED TO ACFT ON R SIDE.L WING STRUCK EAL 727 ACFT,NR 2 ENG REVERSER DMGD.

1-0005	3/4/77 TIME - 1115	DAYTON,OH	BOEING 727 N6834 DAMAGE-NONE	CR- 0 0 6 PX- 0 1 64	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 43, 11000 TOTAL HOURS, 5000 IN TYPE, INSTRUMENT RATED.

OPERATOR - AMERICAN AIRLINES,INC.
DEPARTURE POINT
COLUMBUS,OH
INTENDED DESTINATION
DALLAS,TX
LAST ENROUTE STOP
NASHVILLE,TN
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE, ASSOCIATED W/CLOUDS AND/OR THUNDERSTORMS
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON
WEATHER BRIEFING - COMPANY DISPATCH
WEATHER FORECAST - FORECAST SUBSTANTIALLY CORRECT

SKY CONDITION
BROKEN
CEILING AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
VISIBILITY AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
PRECIPITATION AT ACCIDENT SITE
DRIZZLE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
FOG
TYPE OF WEATHER CONDITIONS
IFR
TYPE OF FLIGHT PLAN
IFR

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0006	2/10/77 TIME - 0758	SHENANDOAH,VA	NIHON YS11 N247P DAMAGE-NONE	CR- 0 1 3 PX- 0 0 23	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 41, 6734 TOTAL HOURS, 4088 IN TYPE, INSTRUMENT RATED.

OPERATOR - PIEDMONT AVIATION,INC.
DEPARTURE POINT
SHENANDOAH,VA
INTENDED DESTINATION
CHARLOTTESVILLE,VA
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE IN FLIGHT,CLEAR AIR
PERSONNEL - FLIGHT PERSONNEL FLIGHT ATTENDANT
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON
WEATHER BRIEFING - COMPANY DISPATCH
WEATHER FORECAST - FORECAST SUBSTANTIALLY CORRECT

SKY CONDITION
SCATTERED
CEILING AT ACCIDENT SITE
UNLIMITED
VISIBILITY AT ACCIDENT SITE
5 OR OVER(UNLIMITED)
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
TYPE OF WEATHER CONDITIONS
VFR
TYPE OF FLIGHT PLAN
IFR
REMARKS- UNFORECAST CAT.

1-0007	2/11/77 TIME - 0735	NR.WACO,TX	BOEING 727 N7286 DAMAGE-NONE	CR- 0 1 5 PX- 0 0 46	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

OPERATOR - BRANIFF AIRWAYS,INC.
DEPARTURE POINT
HOUSTON,TX
INTENDED DESTINATION
DALLAS FT WORTH,TX
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT DESCENDING

PROBABLE CAUSE(S)
WEATHER - TURBULENCE IN FLIGHT,CLEAR AIR
PERSONNEL - FLIGHT PERSONNEL FLIGHT ATTENDANT
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON

SKY CONDITION
CLEAR
CEILING AT ACCIDENT SITE
UNLIMITED
VISIBILITY AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
TYPE OF WEATHER CONDITIONS
VFR
TYPE OF FLIGHT PLAN
IFR

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES	F	S	M/N	FLIGHT PURPOSE	PILOT DATA
1-0008	2/2/77 TIME - 2115	PARSONS,KS	SWEARINGEN SA-226 N224AM DAMAGE-NONE	CR- PX-	0 0	0 1	2 8	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 32, 8725 TOTAL HOURS, 62 IN TYPE, INSTRUMENT RATED.
1-0009	3/9/77 TIME - 1600	EMMONAK,AK	DEHAVILLAND DHC-6 N2714R DAMAGE-SUBSTANTIAL	CR- PX-	0 0	0 0	2 0	SCHED DOM CARGO SRV	AIRLINE TRANSPORT, AGE UNK/NR, 6100 TOTAL HOURS, 1200 IN TYPE, INSTRUMENT RATED.

1-0008

NAME OF AIRPORT - TRI CITY PARSONS
OPERATOR - AIR MIDWEST,INC.
DEPARTURE POINT
KANSAS CITY MO
INTENDED DESTINATION
PARSONS,KS
TYPE OF ACCIDENT
MISCELLANEOUS
PHASE OF OPERATION
STATIC IDLING ENGINE(S)

PROBABLE CAUSE(S)
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
REMARKS- PAX DEPLANING FELL,BROKE HIP.

1-0009

NAME OF AIRPORT - EMMONAK
OPERATOR - WIEN ALASKA AIRLINES,INC.
DEPARTURE POINT
ST MARYS,AK
INTENDED DESTINATION
EMMONAK,AK
TYPE OF ACCIDENT
UNDERSHOOT
HARD LANDING
PHASE OF OPERATION
LANDING FINAL APPROACH
LANDING FINAL APPROACH

PROBABLE CAUSE(S)
PILOT IN COMMAND - MISJUDGED DISTANCE,SPEED,AND ALTITUDE
FACTOR(S)
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS SNOW ON RUNWAY
TERRAIN - SNOW-COVERED
REMARKS- APCH END RWY 3 STARTS AT BANK OF YUKON RVR.AREA SLOPES DWN ABOUT 45DEG.RWY,BANK & RIVER SNOW CVRD.

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0010	4/4/77 TIME - 1619	NEW HOPE,GA	DOUGLAS DC-9 N1335U DAMAGE-DESTROYED	CR- 2 1 1 PX- 60 21 0 OT- 8 1 0	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 54, 19380 TOTAL HOURS, 3205 IN TYPE, INSTRUMENT RATED.

OPERATOR - SOUTHERN AIRWAYS,INC.
DEPARTURE POINT
MUSCLE SHOALS,AL
INTENDED DESTINATION
ATLANTA,GA
LAST ENROUTE STOP
HUNTSVILLE,AL
TYPE OF ACCIDENT
ENGINE FAILURE OR MALFUNCTION
COLLISION WITH GROUND/WATER CONTROLLED
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE
LANDING LEVEL OFF/TOUCHDOWN

PROBABLE CAUSE(S)
POWERPLANT - MISCELLANEOUS COMPRESSOR STALLS
POWERPLANT - COMPRESSOR ASSEMBLY OTHER
MISCELLANEOUS ACTS,CONDITIONS - OVERHEATED
WEATHER - HAIL
WEATHER - THUNDERSTORM ACTIVITY
FACTOR(S)
PERSONNEL - DISPATCHING (AIR CARRIER ONLY) FAILURE TO KEEP FLIGHT PROPERLY ADVISED
PILOT IN COMMAND - IMPROPER IN-FLIGHT DECISIONS OR PLANNING
COMPLETE POWER LOSS - COMPLETE ENGINE FAILURE/FLAMEOUT-2 ENGINES
WEATHER BRIEFING - COMPANY DISPATCH
WEATHER FORECAST - FORECAST SUBSTANTIALLY CORRECT
EMERGENCY CIRCUMSTANCES - FORCED LANDING OFF AIRPORT ON LAND

SKY CONDITION
OBSCURATION
VISIBILITY AT ACCIDENT SITE
3/4 MILE OR LESS
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
WIND VELOCITY-KNOTS
28
TYPE OF FLIGHT PLAN
IFR
CEILING AT ACCIDENT SITE
500
PRECIPITATION AT ACCIDENT SITE
RAIN SHOWERS, THUNDERSTORM
WIND DIRECTION-DEGREES
320
TYPE OF WEATHER CONDITIONS
IFR
FIRE AFTER IMPACT
REMARKS- INGESTION OF MASSIVE AMTS OF WATER & HAIL,THRUST LEVER MVT INDUCED STALL.PLT RELIED ON WX RADAR.

1-0011	7/6/77 TIME - 1500	NR.LOS ANGELES,CA	DOUGLAS DC-10 N66NA DAMAGE-NONE	CR- 0 0 10 PX- 0 1 65	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 56, 24128 TOTAL HOURS, 66 IN TYPE, INSTRUMENT RATED.

OPERATOR - NATIONAL AIRLINES,INC
DEPARTURE POINT
NEW ORLEANS,LA
INTENDED DESTINATION
SAN DIEGO,CA
LAST ENROUTE STOP
LOS ANGELES,CA
TYPE OF ACCIDENT
UNCONTROLLED ALTITUDE DEVIATIONS
PHASE OF OPERATION
IN FLIGHT DESCENDING

PROBABLE CAUSE(S)
SYSTEMS - AUTO PILOT OTHER
REMARKS- PITCH COMPUTER MALF.ACFT PITCHED.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES	FLIGHT	PILOT DATA

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0012	8/21/77 TIME - 1845	NEW YORK,NY	DOUGLAS DC-9 N956VJ DAMAGE-SUBSTANTIAL	CR- 0 0 4 PX- 0 0 92	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - JFK INTL
OPERATOR - ALLEGHENY AIRLINES,INC.
DEPARTURE POINT
NEW YORK,NY
INTENDED DESTINATION
BUFFALO,NY
TYPE OF ACCIDENT
COLLIDED WITH OBJECT
PHASE OF OPERATION
TAXI OTHER

PROBABLE CAUSE(S)
PILOT IN COMMAND - FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS
PERSONNEL - MISCELLANEOUS-PERSONNEL GROUND CREWMAN
REMARKS- TAXIING FM PAN AM RAMP GATE-1 ACFT R WG STRUCK A PARKED TUG.

1-0013	I/16/77 TIME - 1748	BALTIMORE,MD	DOUGLAS DC-8 N904CL DAMAGE-MINOR	CR- 0 1 7 PX- 0 6 87	NS/CTR REVENUE PASSG INTL	AIRLINE TRANSPORT, AGE 50, 18200 TOTAL HOURS, 8200 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - BWI
OPERATOR - CAPITOL AIRWAYS
DEPARTURE POINT
SAN JUAN,PR
INTENDED DESTINATION
NEW YORK,NY
LAST ENROUTE STOP
BALTIMORE,MD
TYPE OF ACCIDENT
ENGINE FAILURE OR MALFUNCTION
MISCELLANEOUS
PHASE OF OPERATION
TAKEOFF RUN
TAKEOFF ABORTED

PROBABLE CAUSE(S)
POWERPLANT - COMPRESSOR ASSEMBLY DISC, COMPRESSOR ROTOR
PILOT IN COMMAND - FAILED TO FOLLOW APPROVED PROCEDURES,DIRECTIVES,ETC.
COPILOT - FAILED TO FOLLOW APPROVED PROCEDURES,DIRECTIVES,ETC.
PERSONNEL - FLIGHT PERSONNEL FLIGHT ATTENDANT
FACTOR(S)
WEATHER - UNFAVORABLE WIND CONDITIONS
COMPLETE POWER LOSS - COMPLETE ENGINE FAILURE/FLAMEOUT-1 ENGINE

SKY CONDITION
SCATTERED
CEILING AT ACCIDENT SITE
UNLIMITED
VISIBILITY AT ACCIDENT SITE
5 OR OVER(UNLIMITED)
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
WIND DIRECTION-DEGREES
320
WIND VELOCITY-KNOTS
20
TYPE OF WEATHER CONDITIONS
VFR
TYPE OF FLIGHT PLAN
IFR
REMARKS- INJURIES OCCURRED DURING EVACUATION

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0014	8/5/77 TIME - 0035	NR.MIAMI,FL	DOUGLAS DC-8 N815E DAMAGE-NONE	CR- 0 1 6 PX- 0 0 56	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, 13000 TOTAL HOURS, 2500 IN TYPE, INSTRUMENT RATED.

OPERATOR - DELTA AIR LINES,INC.
DEPARTURE POINT
CHICAGO,ILL.
INTENDED DESTINATION
MIAMI,FL
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT DESCENDING

PROBABLE CAUSE(S)
WEATHER - TURBULENCE IN FLIGHT,CLEAR AIR
PERSONNEL - FLIGHT PERSONNEL FLIGHT ATTENDANT
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON

SKY CONDITION
SCATTERED
CEILING AT ACCIDENT SITE
UNLIMITED
VISIBILITY AT ACCIDENT SITE
5 OR OVER(UNLIMITED)
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
TYPE OF WEATHER CONDITIONS
VFR
TYPE OF FLIGHT PLAN
IFR

1-0015	7/16/77 TIME - 0005	NR.FT.WAYNE,IN	DOUGLAS DC-6A N515TY DAMAGE-NONE	CR- 0 0 4 PX- 0 1 2	NS/CTR REVENUE CARGO DOM	AIRLINE TRANSPORT, AGE 45, 7500 TOTAL HOURS, 1015 IN TYPE, INSTRUMENT RATED.

OPERATOR - ROSENBALM AVIATION
DEPARTURE POINT
ST.LOUIS,MO
INTENDED DESTINATION
YPSILANTI,MI
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE, ASSOCIATED W/CLOUDS AND/OR THUNDERSTORMS
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
WEATHER - THUNDERSTORM ACTIVITY
WEATHER BRIEFING - BRIEFING RECEIVED-METHOD UNKNOWN
WEATHER FORECAST - FORECAST SUBSTANTIALLY CORRECT

SKY CONDITION
SCATTERED
CEILING AT ACCIDENT SITE
25000
VISIBILITY AT ACCIDENT SITE
5 OR OVER(UNLIMITED)
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
NONE
TYPE OF WEATHER CONDITIONS
IFR
TYPE OF FLIGHT PLAN
IFR
REMARKS- PASSENGER SUFFERED BROKEN LEG.THUNDERSTORMS AND RAIN SHOWERS IN VICINITY.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0016	8/7/77 TIME - 1540	NR.VARADERO,CUBA	DOUGLAS DC-8 N812BN DAMAGE-NONE	CR- 0 2 7 PX- 0 8110	SCHED INTERNATL PASSG SRV	AIRLINE TRANSPORT, AGE 52, 23531 TOTAL HOURS, 2542 IN TYPE, INSTRUMENT RATED.

OPERATOR - BRANIFF AIRWAYS,INC.
DEPARTURE POINT
BOGOTA,COLUMBIA
INTENDED DESTINATION
MIAMI,FL
LAST ENROUTE STOP
PANAMA
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE, ASSOCIATED W/CLOUDS AND/OR THUNDERSTORMS
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
PERSONNEL - FLIGHT PERSONNEL FLIGHT ATTENDANT
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON
WEATHER BRIEFING - COMPANY DISPATCH

SKY CONDITION
OVERCAST
CEILING AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
VISIBILITY AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
PRECIPITATION AT ACCIDENT SITE
NONE
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
TYPE OF WEATHER CONDITIONS
IFR
TYPE OF FLIGHT PLAN
IFR

1-0017	7/22/77 TIME - 1145	NR.GLENDALE,CA	LOCKHEED 188C N171PS DAMAGE-NONE	CR- 0 2 3 PX- 0 0 97	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, 6780 TOTAL HOURS, 85 IN TYPE, INSTRUMENT RATED.

OPERATOR - PACIFIC SOUTHWEST
DEPARTURE POINT
LAKE TAHOE,CA
INTENDED DESTINATION
LOS ANGELES,CA
TYPE OF ACCIDENT
EVASIVE MANEUVER
PHASE OF OPERATION
IN FLIGHT DESCENDING

PROBABLE CAUSE(S)
PILOT-SAW OTR ACFT TOO LATE TO AVOID MANEUVER
PERSONNEL - MISCELLANEOUS-PERSONNEL PILOT OF OTHER AIRCRAFT
MISCELLANEOUS - EVASIVE MANEUVER TO AVOID COLLISION
REMARKS- EVADING C-150,N19095,WHICH HAD TRANSPONDER OFF.

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0018	7/6/77 TIME - 2327	ST.LOUIS,MO	LOCKHEED L-188C N280F DAMAGE-DESTROYED	CR- 3 0 0 PX- 0 0 0	NS/CTR REVENUE CARGO DOM	ATP,FLIGHT INSTR., AGE 32, 11540 TOTAL HOURS, 390 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - ST.LOUIS LAMBERT
OPERATOR - FLEMING INTERNATIONAL AIRWAYS
DEPARTURE POINT
ST.LOUIS,MO
INTENDED DESTINATION
YPSILANTI AIRPORT,MI
TYPE OF ACCIDENT
PROPELLER/ROTOR FAILURE PROPELLER
COLLISION WITH GROUND/WATER UNCONTROLLED
PHASE OF OPERATION
TAKEOFF INITIAL CLIMB
IN FLIGHT UNCONTROLLED DESCENT

PROBABLE CAUSE(S)
PILOT IN COMMAND - EXERCISED POOR JUDGMENT
PILOT IN COMMAND - ATTEMPTED OPERATION W/KNOWN DEFICIENCIES IN EQUIPMENT
PILOT IN COMMAND - FAILED TO FOLLOW APPROVED PROCEDURES,DIRECTIVES,ETC.
MISCELLANEOUS ACTS,CONDITIONS - THRUST REVERSAL-UNWANTED
MISCELLANEOUS ACTS,CONDITIONS - OIL EXHAUSTION-PROPELLER SYSTEM
POWERPLANT - PROPELLER SYSTEM FEATHERING PUMP
MISCELLANEOUS ACTS,CONDITIONS - LEAK/LEAKAGE
PERSONNEL - MAINTENANCE,SERVICING,INSPECTION INADEQUATE MAINTENANCE AND INSPECTION
PERSONNEL - OPERATIONAL SUPERVISORY PERSONNEL DEFICIENCY,COMPANY MAINTAINED EQPMT,SERVICES,REGULATION
MISCELLANEOUS ACTS,CONDITIONS - PILOT FATIGUE
FIRE AFTER IMPACT
REMARKS- #2 AUTOFEATHERED 1ST T/O.OIL REPLACED IMPROPERLY.#2 PROP RVRSD 2ND T/O.PUMP OUTPUT O-RINGS BAD.

1-0019	10/2/77 TIME - 2319	SHANNON ARPT,IRLD	DOUGLAS DC-8 N911CL DAMAGE-SUBSTANTIAL	CR- 0 0 10 PX- 0 17232	NS/CTR REVENUE PASSG INTL	AIRLINE TRANSPORT, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - SHANNON ARPT
OPERATOR - CAPITOL AIRWAYS
DEPARTURE POINT
SHANNON ARPT,IRLD
INTENDED DESTINATION
WINDSOR LOCKS,CT,USA
TYPE OF ACCIDENT
MISCELLANEOUS
MISCELLANEOUS
PHASE OF OPERATION
TAXI TO TAKEOFF
TAKEOFF ABORTED

REMARKS- INVEST UNDER JURISDICTION OF GOVT OF IRELAND.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0020	3/12/77 TIME - 2130	NR.ATLANTA,GA	LOCKHEED L-1011 N329 DAMAGE-NONE	CR- 0 0 13 PX- 0 1110	SCHED DOM PASSG SRV	ATP,FLIGHT INSTR., AGE 57, 30000 TOTAL HOURS, 1870 IN TYPE, INSTRUMENT RATED.

OPERATOR - EASTERN AIR LINES,INC.
DEPARTURE POINT
ATLANTA,GA
INTENDED DESTINATION
MIAMI,FL
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT CLIMB TO CRUISE

PROBABLE CAUSE(S)
WEATHER - TURBULENCE, ASSOCIATED W/CLOUDS AND/OR THUNDERSTORMS
PERSONNEL - MISCELLANEOUS-PERSONNEL PASSENGER
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT NOT FASTENED
FACTOR(S)
MISCELLANEOUS ACTS,CONDITIONS - SEAT BELT SIGN ON
WEATHER BRIEFING - COMPANY DISPATCH
WEATHER FORECAST - UNKNOWN/NOT REPORTED

SKY CONDITION
OVERCAST
CEILING AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
VISIBILITY AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
PRECIPITATION AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
UNKNOWN/NOT REPORTED
TYPE OF WEATHER CONDITIONS
IFR
TYPE OF FLIGHT PLAN
IFR

1-0021	12/18/77 TIME - 0139	NR.KAYSVILLE,UT	DOUGLAS DC-8F N8047U DAMAGE-DESTROYED	CR- 3 0 0 PX- 0 0 0	SCHED DOM CARGO SRV	AIRLINE TRANSPORT, AGE 49, 14954 TOTAL HOURS, 4148 IN TYPE, INSTRUMENT RATED.

OPERATOR - EASTERN AIR LINES,INC.
DEPARTURE POINT
SAN FRANCISCO,CA
INTENDED DESTINATION
CHICAGO,IL
LAST ENROUTE STOP
SALT LAKE CITY,UT
TYPE OF ACCIDENT
COLLISION WITH GROUND/WATER CONTROLLED
PHASE OF OPERATION
IN FLIGHT HOLDING

PROBABLE CAUSE(S)
PERSONNEL - TRAFFIC CONTROL PERSONNEL ISSUED IMPROPER OR CONFLICTING INSTRUCTIONS
PILOT IN COMMAND - IMPROPER IFR OPERATION
FACTOR(S)
SYSTEMS - ELECTRICAL SYSTEM OTHER
MISCELLANEOUS ACTS,CONDITIONS - ELECTRICAL FAILURE
REMARKS- INCOMP & ABIGUOUS HOLDING CLNC. #1 ELECT SYST INOP.HIT MTN NEAR 7200FT LVL.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0022	6/3/77 TIME - 1258	TUCSON,AZ	BOEING 727 N32725 DAMAGE-SUBSTANTIAL	CR- 0 0 7 PX- 0 0 84	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 41, 6820 TOTAL HOURS, 420 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - TUCSON INTL
OPERATOR - CONTINENTAL AIR LINES,INC.
DEPARTURE POINT
HOUSTON,TX
INTENDED DESTINATION
LOS ANGELES,CA
LAST ENROUTE STOP
PHOENIX,AZ
TYPE OF ACCIDENT
COLLIDED WITH WIRES/POLES
PHASE OF OPERATION
TAKEOFF INITIAL CLIMB

PROBABLE CAUSE(S)
PILOT IN COMMAND - INITIATED FLIGHT IN ADVERSE WEATHER CONDITIONS
WEATHER - WIND SHEAR
WEATHER BRIEFING - COMPANY DISPATCH
WEATHER FORECAST - FORECAST SUBSTANTIALLY CORRECT

SKY CONDITION
BROKEN
CEILING AT ACCIDENT SITE
9000
VISIBILITY AT ACCIDENT SITE
5 OR OVER(UNLIMITED)
PRECIPITATION AT ACCIDENT SITE
RAIN SHOWERS
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
BLOWING DUST
TEMPERATURE-F
92
WIND DIRECTION-DEGREES
210
WIND VELOCITY-KNOTS
21
TYPE OF WEATHER CONDITIONS
VFR
TYPE OF FLIGHT PLAN
IFR
REMARKS- EVIDENT HAZARDOUS WIND CONDITIONS.HIT PWR LINES ABT 710FT FRM DEPARTURE END OF RWY.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0023	11/17/77 TIME - 0256	JAMAICA,NY	BOEING 747F N616US DAMAGE-SUBSTANTIAL	CR- 0 0 3 PX- 0 0 0	SCHED DOM CARGO SRV	AIRLINE TRANSPORT, AGE 49, 19222 TOTAL HOURS, 790 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - JF KENNEDY INTL
OPERATOR - NORTHWEST AIRLINES,INC.
DEPARTURE POINT
SEATTLE,WA
INTENDED DESTINATION
JAMAICA,NY
LAST ENROUTE STOP
CHICAGO,IL
TYPE OF ACCIDENT
GROUND-WATER LOOP-SWERVE
GEAR COLLAPSED
PHASE OF OPERATION
LANDING ROLL
LANDING ROLL

PROBABLE CAUSE(S)
PILOT IN COMMAND - FAILED TO MAINTAIN DIRECTIONAL CONTROL
FACTOR(S)
PERSONNEL - AIRPORT SUPERVISORY PERSONNEL IMPROPER MAINTENANCE-AIRPORT FACILITIES
PERSONNEL - MISCELLANEOUS-PERSONNEL OTHER
AIRFRAME - LANDING GEAR OTHER
POWERPLANT - THRUST REVERSER OTHER
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS POORLY MAINTAINED RUNWAY SURFACE
AIRPORTS/AIRWAYS/FACILITIES - AIRPORT CONDITIONS WET RUNWAY
WEATHER - RAIN
WEATHER - UNFAVORABLE WIND CONDITIONS
MISCELLANEOUS ACTS,CONDITIONS - HYDROPLANING ON WET RUNWAY

SKY CONDITION
OVERCAST
CEILING AT ACCIDENT SITE
5000
VISIBILITY AT ACCIDENT SITE
4 MILES OR LESS
PRECIPITATION AT ACCIDENT SITE
RAIN
OBSTRUCTIONS TO VISION AT ACCIDENT SITE
FOG
RELATIVE BEARING OF WIND
RIGHT CROSS WIND 068-112 DEGREES
TEMPERATURE-F
55
WIND DIRECTION-DEGREES
220
WIND VELOCITY-KNOTS
12
TYPE OF WEATHER CONDITIONS
IFR
TYPE OF FLIGHT PLAN
IFR

REMARKS- RWY NOT GROOVED AS PUBLISHED,HEAVILY RUBBER COATED.#1 REVERSER,AUTOBRAKE INOP.ATIS ABT 4HRS OLD.

1-0024	6/9/77 TIME - 1900	NR.BERLIN,GERMANY	BOEING 727 N329PA DAMAGE-NONE	CR- 0 1 5 PX- 0 0 62	SCHED INTERNATL PASSG SRV	AIRLINE TRANSPORT, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, INSTRUMENT RATED.

OPERATOR - PAN AMERICAN WORLD AIRWAYS,INC.
DEPARTURE POINT
BERLIN,GERMANY
INTENDED DESTINATION
HAMBURG,GERMANY
TYPE OF ACCIDENT
TURBULENCE
PHASE OF OPERATION
IN FLIGHT NORMAL CRUISE

REMARKS- INVESTIGATION UNDER JURISDICTION OF THE GOVT OF GERMANY.

BRIEFS OF ACCIDENTS

FILE	DATE	LOCATION	AIRCRAFT DATA	INJURIES F S M/N	FLIGHT PURPOSE	PILOT DATA
1-0025	5/16/77 TIME - 1735	NEW YORK,NY	SIKORSKY S-61L N619PA DAMAGE-SUBSTANTIAL	CR- 0 0 3 PX- 4 1 17 OT- 1 1 2	SCHED DOM PASSG SRV	AIRLINE TRANSPORT, AGE 46, 11721 TOTAL HOURS, 2200 IN TYPE, INSTRUMENT RATED.

NAME OF AIRPORT - PAN AM HELIPORT
OPERATOR - NEW YORK AIRWAYS,INC.
DEPARTURE POINT
NEW YORK,NY
INTENDED DESTINATION
LOCAL
TYPE OF ACCIDENT
GEAR COLLAPSED
ROLL OVER
PHASE OF OPERATION
STATIC IDLING ROTORS
STATIC IDLING ROTORS

PROBABLE CAUSE(S)
AIRFRAME - LANDING GEAR MAIN GEAR-SHOCK ABSORBING ASSY,STRUTS,ATTACHMENTS,ETC.
MISCELLANEOUS ACTS,CONDITIONS - FATIGUE FRACTURE
REMARKS- ALL FATALITIES CAUSED BY OPERATING ROTOR BLADES.

1-0026	3/27/77 TIME - 1704	TENERIFE,CANR	BOEING 747 N736PA DAMAGE-DESTROYED	CR- 9 3 4 PX-318 30 32 OT-248 0 0	NS/CTR REVENUE PASSG INTL	CERTIFICATE UNKNOWN, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, UNK/NR INSTRUMENT RATED.

NAME OF AIRPORT - TENERIFE
OPERATOR - PAN AMERICAN WORLD AIRWAYS,INC.
DEPARTURE POINT
TENERIFE,CANR
INTENDED DESTINATION
LAS PALMAS
TYPE OF ACCIDENT
COLLISION WITH AIRCRAFT BOTH ON GROUND
FIRE OR EXPLOSION ON GROUND
PHASE OF OPERATION
TAXI TO TAKEOFF
TAXI TO TAKEOFF

FIRE AFTER IMPACT
REMARKS- INVESTIGATION UNDER JURISDICTION OF THE GOVT OF SPAIN.

1-0026	3/27/77 TIME - 1704	TENERIFE,CANR	BOEING 747 PH-BUP DAMAGE-DESTROYED	CR- 14 0 0 PX-234 0 0 OT-327 33 36	NS/CTR REVENUE PASSG INTL	CERTIFICATE UNKNOWN, AGE UNK/NR, UNK/NR TOTAL HOURS, UNK/NR IN TYPE, UNK/NR INSTRUMENT RATED.

NAME OF AIRPORT - TENERIFE
OPERATOR - KLM
DEPARTURE POINT
TENERIFE,CANR
INTENDED DESTINATION
LAS PALMAS
TYPE OF ACCIDENT
COLLISION WITH AIRCRAFT BOTH ON GROUND
FIRE OR EXPLOSION ON GROUND
PHASE OF OPERATION
TAKEOFF RUN
TAKEOFF RUN

FIRE AFTER IMPACT
REMARKS- INVESTIGATION UNDER JURISDICTION OF THE GOVT OF SPAIN.

AERIAL
ATR,FL
AIR SH
AIR TA
AIR TA
APPROA
APR CT
ASSOC
ASSOC
COMMER
CORP/E
CR-
CTR CA
CTR CA
CTR PA
CTR PA
LAST E
MAPPIN
MIL CO
MIL CO
MILITA
MILITA
MIL/CT
MIL/CT
NR.
NS CTR
NS CTR
NS CTR
NS CTR
NS CTR
NS CTR
OT-
PARAJU
PRIVAT
PX-
RADAR
SCHED
SCHED
SCHED
SCHED
SCHED
SCHED
SCHED
S-D
S-I
UNK/NR

LIST OF ABBREVIATIONS USED IN BRIEFS

AERIAL ADVERTISE	AERIAL ADVERTISING
ATR,FLIGHT INSTR.	AIRLINE TRANSPORT INSTRUCTOR
AIR SHOW/RACING	AIR SHOW/AIR RACING
AIR TAXI-CARGO	AIR TAXI-CARGO OPERATIONS
AIR TAXI-PASSG	AIR TAXI-PASSENGER OPERATIONS
APPROACH CTL-DEPARTURE	APPROACH CONTROL-DEPARTURE
APR CTL-TOW ENRT CTL SRV	APPROACH CONTROL-TOWER EN ROUTE CONTROL SERVICE
ASSOC CROP CTL ACTIVITIES	ASSOCIATED CROP CONTROL ACTIVITIES
ASSOC FIRE CTL ACTIVITIES	ASSOCIATED FIRE CONTROL ACTIVITIES
COMMERCIAL,FLIGHT.INSTR	COMMERCIAL FLIGHT INSTRUCTOR
CORP/EXEC	CORPORATION/EXECUTIVE
CR-	CREW
CTR CARGO-D	CONTRACT/CHARTER-CARGO-DOMESTIC
CTR CARGO-I	CONTRACT/CHARTER-CARGO-INTERNATIONAL
CTR PASSG-D	CONTRACT/CHARTER-PASSENGER-DOMESTIC
CTR PASSG-I	CONTRACT/CHARTER-PASSENGER-INTERNATIONAL
LAST ENROUTE STOP	LAST PLANNED EN ROUTE LANDING POINT
MAPPING/PHOTO	AERIAL MAPPING/PHOTOGRAPHY
MIL CONTRACT CARGO INTL	MILITARY CONTRACT-CARGO-INTERNATIONAL
MIL CONTRACT PASSG INTL	MILITARY CONTRACT-PASSENGER-INTERNATIONAL
MILITARY CTR CARGO DOM	MILITARY CONTRACT-CARGO-DOMESTIC
MILITARY CTR PASSG DOM	MILITARY CONTRACT-PASSENGER-DOMESTIC
MIL/CTR CARGO	MILITARY CONTRACT-CARGO
MIL/CTR PASSG	MILITARY CONTRACT-PASSENGER
NR.	NEAR
NS CTR CARGO	NONSCHEDULED/CHARTER REVENUE CARGO-INTRA-STATE
NS CTR PASSG	NONSCHEDULED/CHARTER REVENUE PASSENGER-INTRA-STATE
NS CTR REVENUE CARGO DOM	NONSCHEDULED/CHARTER REVENUE CARGO-DOMESTIC
NS CTR REVENUE CARGO INTL	NONSCHEDULED/CHARTER REVENUE CARGO-INTERNATIONAL
NS CTR REVENUE PASSG DOM	NONSCHEDULED/CHARTER REVENUE PASSENGER-DOMESTIC
NS CTR REVENUE PASSG INTL	NONSCHEDULED/CHARTER REVENUE PASSENGER-INTERNATL
OT-	OTHER AIRCRAFT AND GROUND
PARAJUMP	PARACHUTE JUMP
PRIVATE,FL.INST R.	PRIVATE FLIGHT INSTRUCTOR
PX-	PASSENGERS
RADAR CTL/SURVEILLANCE	RADAR CONTROL/SURVEILLANCE
SCHED CARGO SRV	SCHEDULED CARGO SERVICE
SCHED DOM PASSG SRV	SCHEDULED DOMESTIC CARGO SERVICE
SCHED DOM CARGO SRV	SCHEDULED DOMESTIC PASSENGER SERVICE
SCHED INTERNATL CARGO SRV	SCHEDULED INTERNATIONAL CARGO SERVICE
SCHED INTERNATL PASSG SRV	SCHEDULED INTERNATIONAL PASSENGER SERVICE
SCHED PASSG SRV	SCHEDULED PASSENGER SERVICE
S-D	SCHEDULED DOMESTIC
S-I	SCHEDULED INTERNATIONAL
UNK/NR	UNKNOWN/NOT REPORTED

APPENDIX C

EXPLANATORY NOTES

EXPLANATORY NOTES

Aircraft Accident: An aircraft accident is "an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which any person suffers death or serious injury as a result of being in or upon the aircraft or by direct contact with the aircraft or anything attached thereto, or the aircraft receives substantial damage."

Air Carrier: Any carrier operating under Code of Federal Regulations, Title 14, Part 121. Includes those operators who have been issued a Certificate of Public Convenience and Necessity by the Civil Aeronautics Board, i.e., certificated route air carriers and supplemental air carriers. Commercial operators of large aircraft (over 12,500 pounds) are also classified as air carriers.

Aircraft-Miles: The distance flown by aircraft in terms of great circle airport-to-airport distances measured in statute miles.

All-Cargo Carriers: Certificated route carriers primarily engaged in the transportation of freight and express. The nonscheduled passenger operations of these carriers are included in this category. All-cargo operations of the passenger/cargo carriers are not included.

All-Cargo Service: Transport service extablished primarily for the transportation of freight, express, and mail.

All-Operations: Refers to all flight operations including test, training, ferry, scheduled and nonscheduled passenger and cargo service, both revenue and nonrevenue.

Causes and Related Factors: In determining probable cause(s) of an accident, all facts, conditions, and circumstances are considered. The objective is to ascertain those cause and effect relationships in the accident sequence about which something can be done to prevent recurrence of the type of accident under consideration. Accordingly, for statistical purposes, where two or more causes exist in an accident, each is recorded and no attempt is made to establish a primary cause. Therefore, in the cause and related factor table, the figures shown in the columns dealing with cause will exceed the total number of accidents. The term "factor" is used, in general, to denote those elements of an accident that further explain or supplement the probable cause(s); this provides a means for collecting essential items of information that could not be readily categorized elsewhere in the system.

Certificate of Public Convenience and Necessity: A certificate issued to an air carrier by the Civil Aeronautics Board, authorizing the carrier to engage in air transportation.

Certificated Route Air Carrier: An air carrier holding a Certificate of Public Convenience and Necessity issued by the Civil Aeronautics Board to conduct scheduled services over specified routes. Certain non-scheduled charter operations may also be conducted by these carriers.

Collision Between Aircraft: Collisions between aircraft are so classified only when both aircraft are occupied. This includes collisions wherein both aircraft are airborne (midair); one is airborne, the other on the ground; and both are on the ground. A collision with a parked unoccupied aircraft is classified under the broad category of collision with objects (parked, unoccupied aircraft). Midair collisions nonfatal to air carrier occupants are included in all computations except the fatal acccident rates.

Commercial Operator: An operator who has been granted a commercial operator operating certificate by the Federal Aviation Administration to engage in the transportation of persons or property in commerce for compensation or hire with large aircraft under 14 CFR 121.

Domestic Operations: Operations within and between the 50 states of the United States. Includes domestic operations of the certificated trunk and all-cargo carriers; the local service, helicopter, Alaskan, Hawaiian, and other carriers.

Domestic Trunk Carriers: Those domestic "grandfather" carriers designated as "trunk carriers" in 1945 or 1946, when "feeder" carriers (now called local service carriers) were granted certificates by the Civil Aeronautics Board to perform local feeder air service. International and territorial operations of the trunk carriers are shown under "international operations" and are not included under "domestic operations."

Helicopter Carriers: Domestic certificated route air carriers employing helicopter aircraft for their primary operations.

International and Territorial Operations: Operations outside the territory of the United States, including operations between the United States and foreign countries and the United States and its territories or possessions. Includes both the combination passenger-cargo (international trunks) and the all-cargo carriers engaged in international and territorial operations.

Local Service Carriers: Certificated domestic route air carriers operating over routes of lesser density between the smaller traffic centers and between those centers and principal centers.

Nonscheduled Service: Revenue flights that are not operated in regular scheduled service such as charter flights and all nonrevenue flights incident to such flights.

Passenger-Mile: One passenger transported 1 mile. Passenger-miles are computed by the summation of the products of the aircraft-miles flown on each inter-airport flight multiplied by the number of passengers carried on the flight.

Phase of Operation: The particular phase of the flight or operation will be that phase of flight in which the first accident type or circumstance occurred. In the event that both the first and second type of accident occur in one operational phase, the same phase is recorded twice.

Revenue Passenger: A person receiving air transportation from an air carrier for which remuneration is received by the air carrier. Air carrier employees and others receiving air transportation against whom token service charges are levied are considered nonrevenue passengers.

Revenue Passenger Enplanements: The count of the total number of passengers boarding aircraft. This count may be measured on the basis of a standard number of passenger enplanements per online originating passengers.

Revenue Passenger Originations: The unduplicated count of passengers orginating journeys on the lines of each reporting entity with the return portion of a round trip counted separately as an initial origination.

Revenue Plane-Miles: The total plane-miles flown in revenue service.

Supplemental Air Carrier: One of a class of air carriers now holding operating certificates issued by the Civil Aeronautics Board, authorizing them to perform passenger and cargo charter service supplementing the scheduled service of the certificated route air carriers.

Type of Accident: The type of accident relates to the circumstances involved in the accident; it indicates what happened. Two separate types may be recorded for one accident. The selection of first and second type is made according to the sequence in which the circumstances occurred.

☆U.S. GOVERNMENT PRINTING OFFICE: 1978-261-264/271