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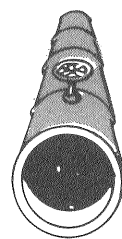
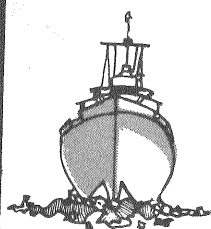
# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

## ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA

U.S. GENERAL AVIATION  
CALENDAR YEAR 1977

ARG-78-2



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16. Abstract  <p>This publication presents the record of aircraft accidents which occurred in U.S. general aviation operations during the calendar year 1977. It includes an analysis of accident data relating to an overview, types of accidents, accident causal factors, kinds of flying, and conclusions; a statistical compilation of accident information presented in the form of accident and rate tables, analytic tables, injury tables and cause/factor tables. These statistical data are divided into sections pertaining to all operations, small fixed-wing aircraft, large fixed-wing aircraft, rotorcraft, gliders, and collisions between aircraft.</p> <p>In 1977, there were 4,286 total general aviation accidents, 702 of which were fatal. Included in the total number of accidents are 51 collisions between aircraft. By coding each aircraft involved in collisions, an additional 51 records were produced, which brought the total number of accident records to 4,337. This figure reflects the actual number of pilots and aircraft involved in the accidents.</p>			
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## Foreword

The Statistical Review of U.S. General Aviation Accidents, published annually by the National Transportation Safety Board, contains statistics compiled from reports of 4,286 general aviation accidents that occurred during calendar year 1977. General aviation comprises one category of U.S. Civil Aviation. The accident records of the only other category, air carriers, are contained in Safety Board publication, "Annual Review of Aircraft Accident Data, U.S. Air Carriers."

Fifty-one collisions are included in the total number of accidents, which brings the total number of records to 4,337. This figure reflects the actual number of pilots and aircraft involved in the 4,286 accidents. All collisions between aircraft included in this publication involve general aviation aircraft in collision with other general aviation aircraft. One of these general aviation aircraft is of foreign register. One accident involving suicide is included in all computations except rates.

The aircraft activity and exposure information used in this publication has historically been provided by the Federal Aviation Administration (FAA). These data include hours and miles flown for all operations, for various categories of aircraft and for specific kinds of flying. In the years before 1977, the FAA requested this exposure information on the same form used annually by all aircraft owners to revalidate their aircraft registration.

However, beginning in 1977, the FAA announced a new program for collecting exposure information on general aviation operations. This new statistical sampling procedure involves a survey questionnaire mailed to a random sample of 30,000 (about 14 percent general aviation aircraft owners). The survey will solicit information relating to hours flown, aircraft location, and other pertinent data.

When this publication was compiled the activity information from this new survey program had not been released by the FAA. Therefore, alternative exposure information was requested from the FAA, and they provided forecast hours flown for calendar year 1977. This forecast activity data was used to compute the various accident rates contained in this publication. This rate data may be revised when the FAA releases final exposure figures for 1977 general aviation operations.

The Safety Board has published numerous special studies, safety bulletins, and accident reports on many of the hazards to aviation covered in this report. All of these publications are available to the public on request.

Also, NTSB Safety Information Bulletins are released concurrently with each issue of the Board's publication, "Aircraft Accident Reports, Brief Format, U.S. Civil Aviation." Each issue of this publication contains a computer-printed synopsis of the pertinent facts and probable cause(s) of about 900 aviation accidents. The 1977 accidents are contained in five issues. Each Safety Information Bulletin highlights a hazardous condition and includes the Safety Board's suggested preventive action.

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# **ANALYSIS OF STATISTICAL INFORMATION**



## Analysis of Statistical Information Overview

There were 4,286 accidents in U.S. general aviation operations during 1977. The accident total in 1977 is higher than in either of the previous 2 years. In 1975 there was a total of 4,237 accidents and in 1976 there was a total of 4,193.

The 4,286 accidents in U.S. general aviation in 1977 involved 4,337 aircraft. Twenty-six percent of these aircraft were destroyed and 72.8 percent were damaged substantially. Seven hundred and two of the 4,286 accidents resulted in fatal injuries; 3,584 were not fatal. There were serious injuries in 424 accidents. Minor injuries were incurred in 627 accidents; there were no injuries in 2,533 of these 4,286 accidents.

There were 8,625 persons aboard the 4,337 aircraft involved in general aviation accidents in 1977; 1,425 persons were fatally injured (16.5 percent of those aboard the aircraft involved). Seven hundred and seventy-eight persons (9.0 percent) were seriously injured, 1,114 (12.9 percent) were injured slightly, 5,308 (61.5 percent) were not injured. An average of 1.99 persons were aboard each general aviation aircraft involved in an accident in 1977.

Aircraft in U.S. general aviation were flown 38.6 million aircraft hours in 1977. This was an increase over 1976 of over 2 million hours flown and almost double the hours flown in 1966. There were 46 persons on the ground involved in these general aviation accidents. Eleven of these persons were fatally injured, 11 were seriously injured, 18 received minor injuries and six were uninjured. There was one person in an aircraft not a part of the U.S. general aviation - all operations tabulation involved in a collision. This person sustained no injuries.

Table 1. -- Overview  
U.S. General Aviation  
1976 Through 1977

	<u>1976</u>	<u>1977</u>	<u>Percentage Change</u>
Aircraft-hours flown <u>1/</u>	36,127,631	38,600,000	+6.84
Eligible aircraft <u>1/</u>	178,304	186,600	+4.65
Total accidents	4,193	4,286	+2.22
Aircraft involved <u>2/</u>	4,241	4,337	+2.26
Aircraft damage <u>2/</u>			
Destroyed	1,095	1,129	+3.11
Substantial	3,112	3,157	+1.45
Minor	14	27	+92.86
None	20	23	+15.00
Unknown/Not Reported	0	0	None
Injury index			
Fatal	695	702	+1.01
Serious	422	424	+0.47
Minor	565	627	+10.97
None	2,511	2,533	+0.88
Unknown/Not Reported	0	0	None
Injuries <u>3/</u>			
Fatal	1,320	1,436	+8.79
Serious	771	789	+2.33
Minor	1,045	1,132	+8.33
None	5,220	5,315	+1.82
Unknown/not reported	1	0	-100.00
Total aboard	8,261	8,625	+4.40
Fire after impact <u>2/</u>			
Fatal accidents	196	190	-3.06
Nonfatal accidents	146	170	+16.44

1/ Source: Federal Aviation Administration

2/ Includes all aircraft involved in collisions.

3/ Includes persons aboard aircraft involved in collisions with general aviation aircraft along with persons injured on the ground.

Figure 1.— ACCIDENTS, FATALITIES U.S. GENERAL AVIATION

1968 - 1977

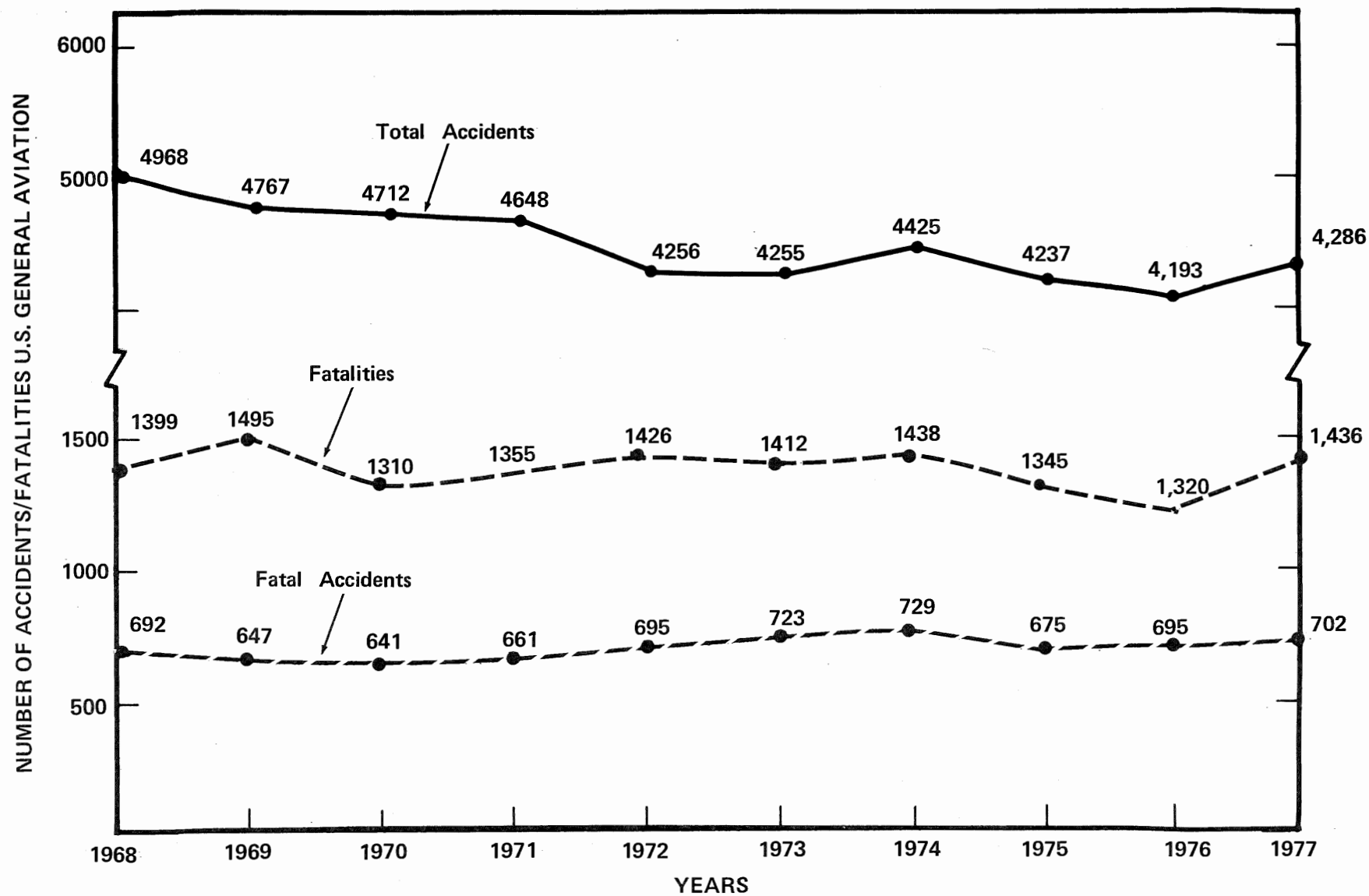
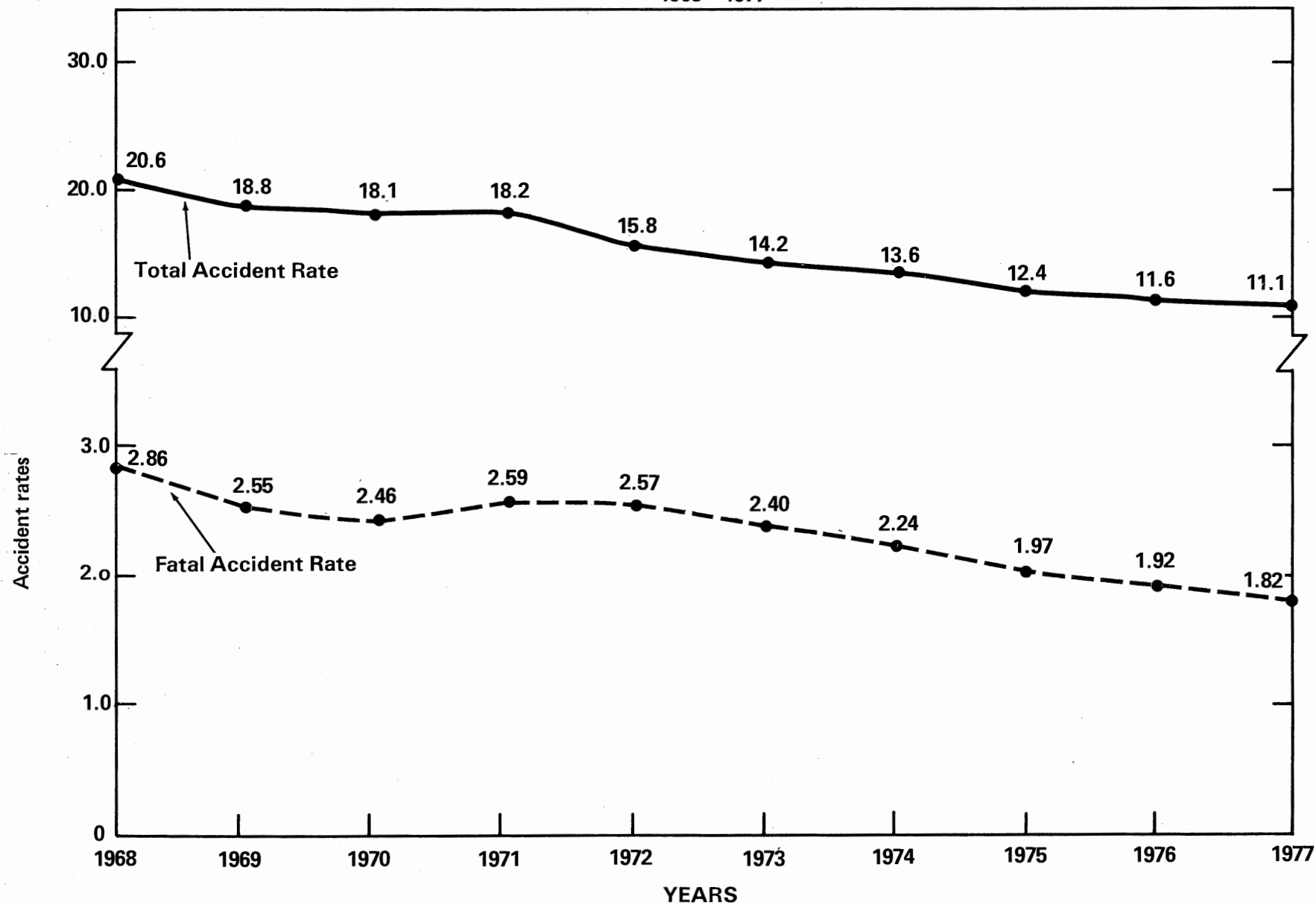


Figure 2.—ACCIDENT RATES PER 100,000 AIRCRAFT—HOURS FLOWN U.S. GENERAL AVIATION  
1968—1977



## Types of Accidents

Engine failure or malfunction is cited as the first accident type in almost 25 percent of general aviation accidents. Because of the nature of this accident classification, it is usually followed by a second type of accident where the actual damage or injury occurred. The primary second types of accidents associated with 1,025 engine failures in order of frequency of occurrence are: Collision with trees (168); nose over/down (136); gear collapse (97); collision with ground/water, controlled (73); and collided with fence, fenceposts (57), and/or trees (57). While engine failure/malfunction accounts for nearly 25 percent of the total general aviation accidents, this accident type accounts for only 13.1 percent of all fatal accidents.

Groundloop, was cited as a first type of accident 501 times; 406 times in conjunction with a second type of accident. The principal second types in order of frequency of occurrence are: Nose over/down (88); gear collapse (86); collided with ditches (60); collided with snowbank (50); and collided with trees (22).

Overshoot was recorded as a first accident type 161 times. The second accident types most frequently cited following an overshoot were: Collided with fence, fenceposts (24) ; collided with trees (24); collided with ditches (22); nose over/down (22); and gear collapsed (17).

Of the 251 accidents involving hard landing as first type of accident, 107 accidents had gear collapse cited as a second accident type.

Engine failures or malfunctions, groundloops, hard landings, nose over/down, and overshoots account for nearly 50 percent of all accident type citations, but only about 15 percent (102) of the fatal accidents. The remaining five leading accident types--collision with ground/water, controlled, collided with trees, stall/ mush, collision with ground/water, uncontrolled, and undershoot--accounted for less than 25 percent of the total accidents. However, these five types accounted for 43 percent (303) of the fatal accidents.



Types of Accidents  
Table 2.---Ten Most Frequent Types of Accidents  
1977

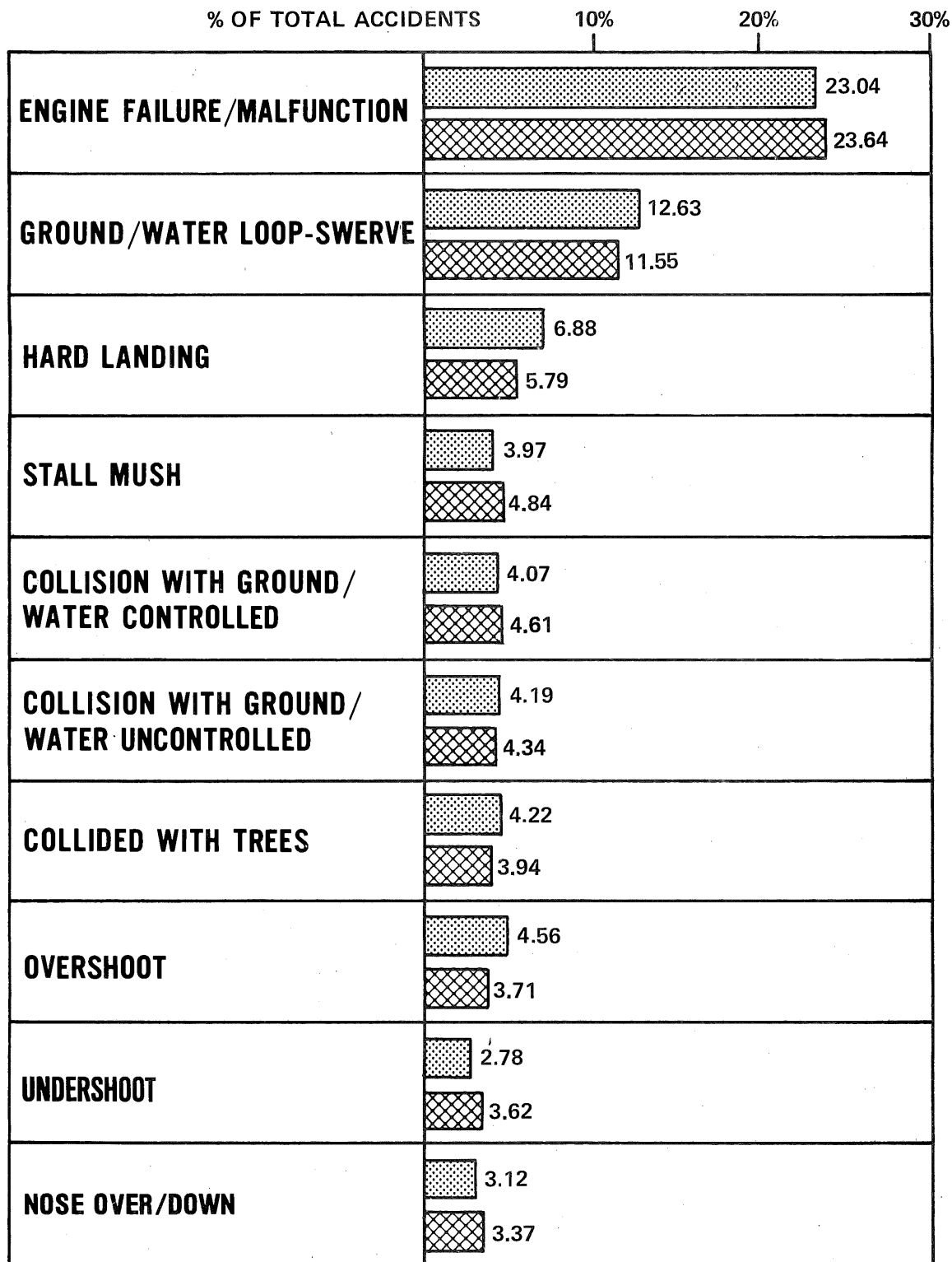
<u>Type of Accident</u>	<u>Frequency</u>	<u>Percent of Total Accident Records</u>
Engine failure or malfunction	1,025	23.64
Ground - water loop-swerve	501	11.55
Hard landing	251	5.79
Stall/mush	210	4.84
Collision with ground/water controlled	200	4.61
Collision with ground/water uncontrolled	188	4.34
Collided with trees	171	3.94
Overshoot	161	3.71
Undershoot	157	3.62
Nose over/down	146	3.37

Types of Fatal Accidents  
Table 3.---Ten Most Frequent Types of Fatal Accidents

<u>Type of Accident</u>	<u>Frequency</u>	<u>Percent of Fatal Accident Records</u>
Collision with ground/water uncontrolled	130	18.06
Engine failure or malfunction	94	13.06
Stall/spin	93	12.92
Collision with ground/water controlled	92	12.78
Airframe failure inflight	48	6.67
Collided with trees	48	6.67
Stall	39	5.42
Midair collisions	34*	4.72
Collided with wires/poles	30	4.17
Stall/mush	23	3.19

\* Includes both aircraft records.

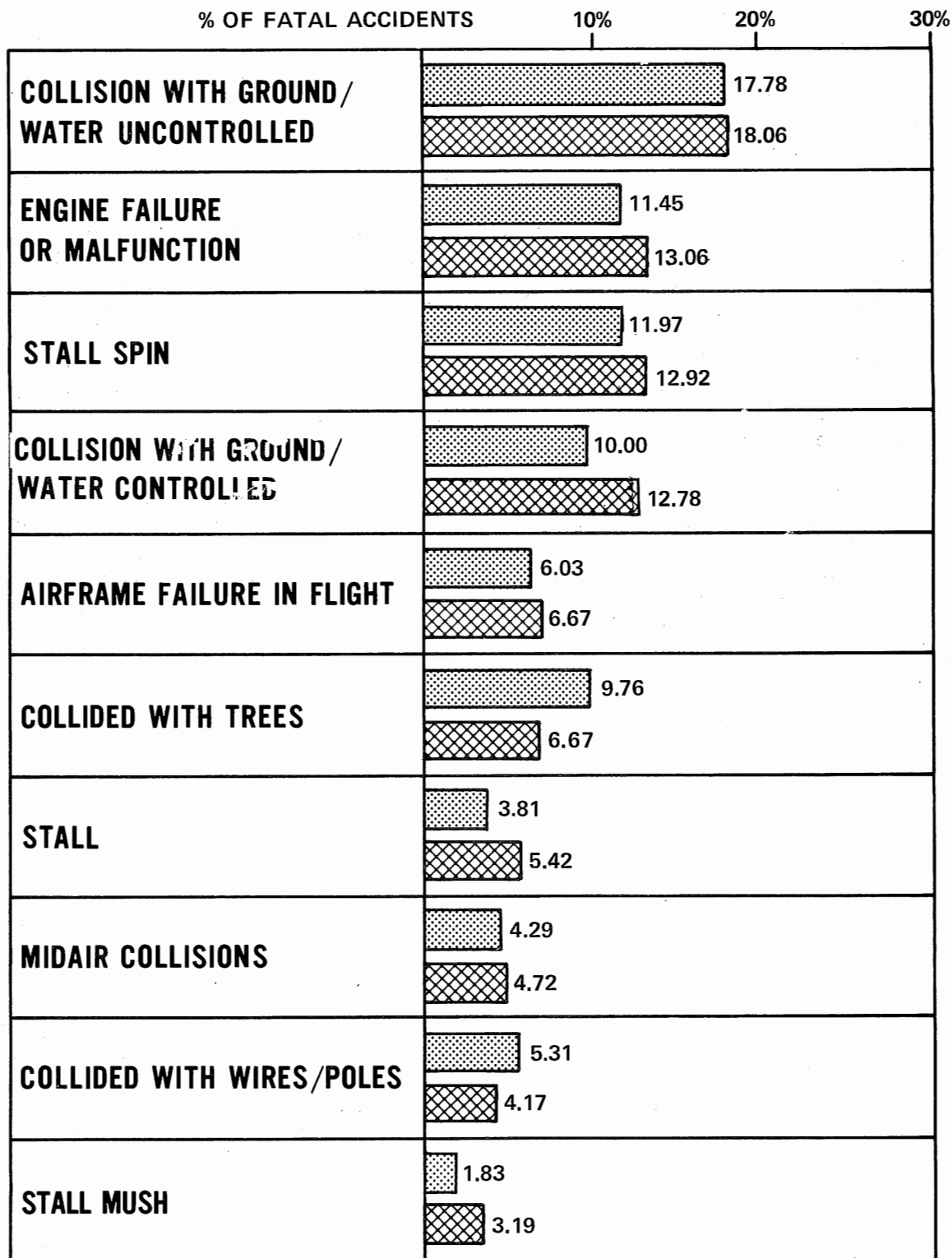
**Figure 3.-- TEN MOST PREVALENT ACCIDENT TYPES  
U.S. GENERAL AVIATION 1977 Vs. 5-YEAR AVERAGE**



1972 - 1976 AVERAGE — 

1977 — 

**Figure 4.--TEN MOST PREVALENT FATAL ACCIDENT TYPES  
U.S. GENERAL AVIATION 1977 Vs. 5-YEAR AVERAGE**



1972 - 1976 AVERAGE -



1977 -



## Phases of Operation

The 1977 distribution pattern of accidents by phase of operation maintained a consistent trend with the average of the past 5 years, (1972-1976), on a percentage basis.

The distribution is listed on two tables (tables 4 and 5) and graphically charted on two figures (figures 5 and 6). Table 4 and figure 5 depict total accidents by phase. Table 5 and figure 6 illustrate the distribution of fatal accident per phase.

Considering total accidents by phase, the highest percentage of accidents occurs during the landing phase. Following landing phase, in descending order by percentage of accidents, are in-flight phase, takeoff phase, taxi phase and static phase. (See table 4 and figure 5). Accidents during the landing phase have the highest percentage total for a 5 year average (1972-1976) of 42.94 percent. This compares to 41.35 percent for the landing phase during 1977. The in-flight phase averages about 33 percent of total accidents, with the takeoff phase averaging about 20 percent.

With reference to fatal accidents by phase, the in-flight phase has the highest number of accidents (67.67 percent) for the same preceding 5 year period and 66.81 percent for 1977. The landing phase has the second highest number of fatal accidents (17.08 percent), followed by takeoff (12.37 percent), static (0.56 percent), and taxi (0.14 percent). (See table 5 and figure 6).

Phases of Operation

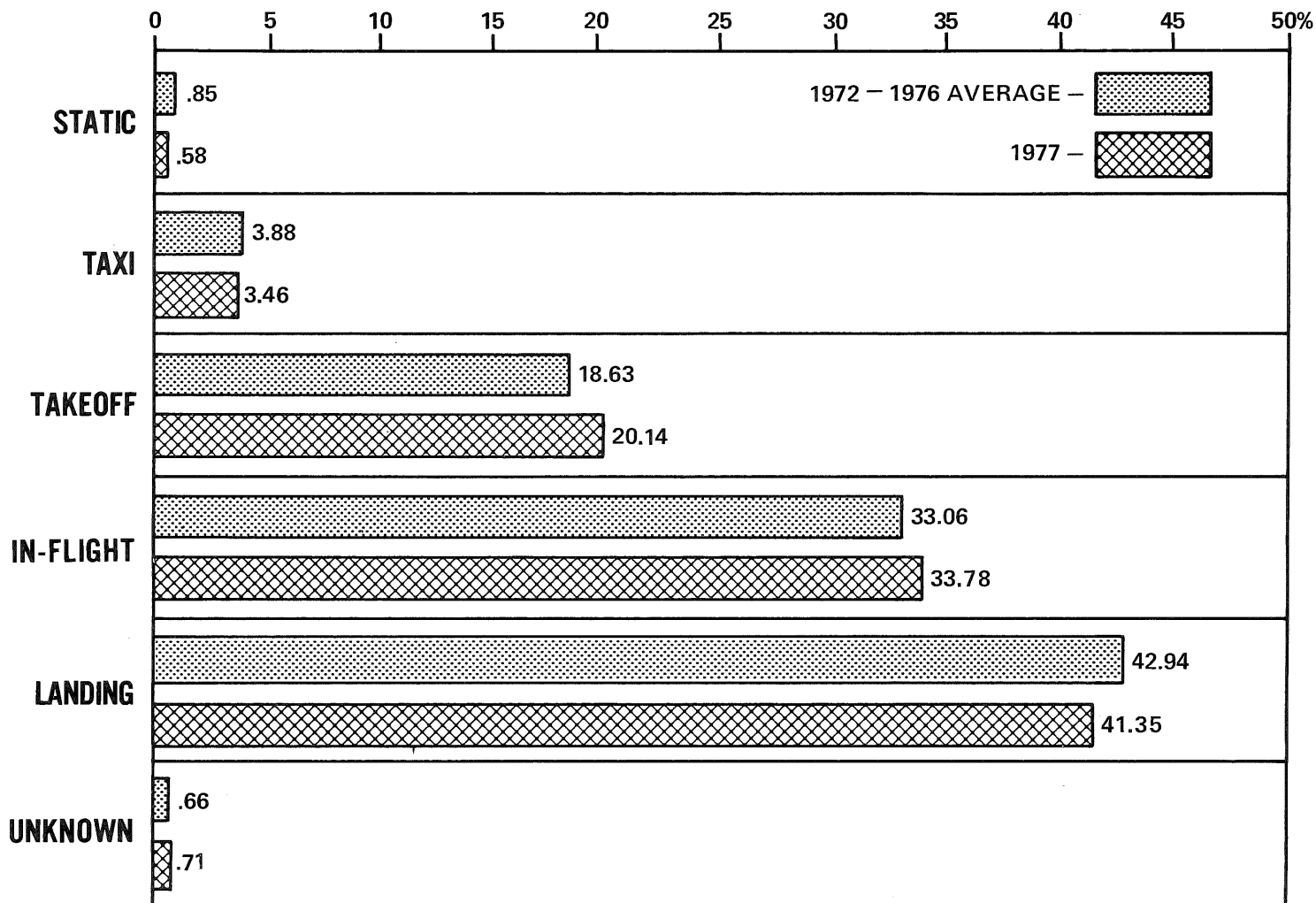
Table 4 - Total Accidents by Phase of Operation

<u>Phase of Operation</u>	<u>Number of Accident Records</u>	<u>Percent of Total Records</u>
Landing	1793	41.35
Inflight	1464	33.76
Takeoff	873	20.14
Taxi	150	3.46
Static	25	0.58

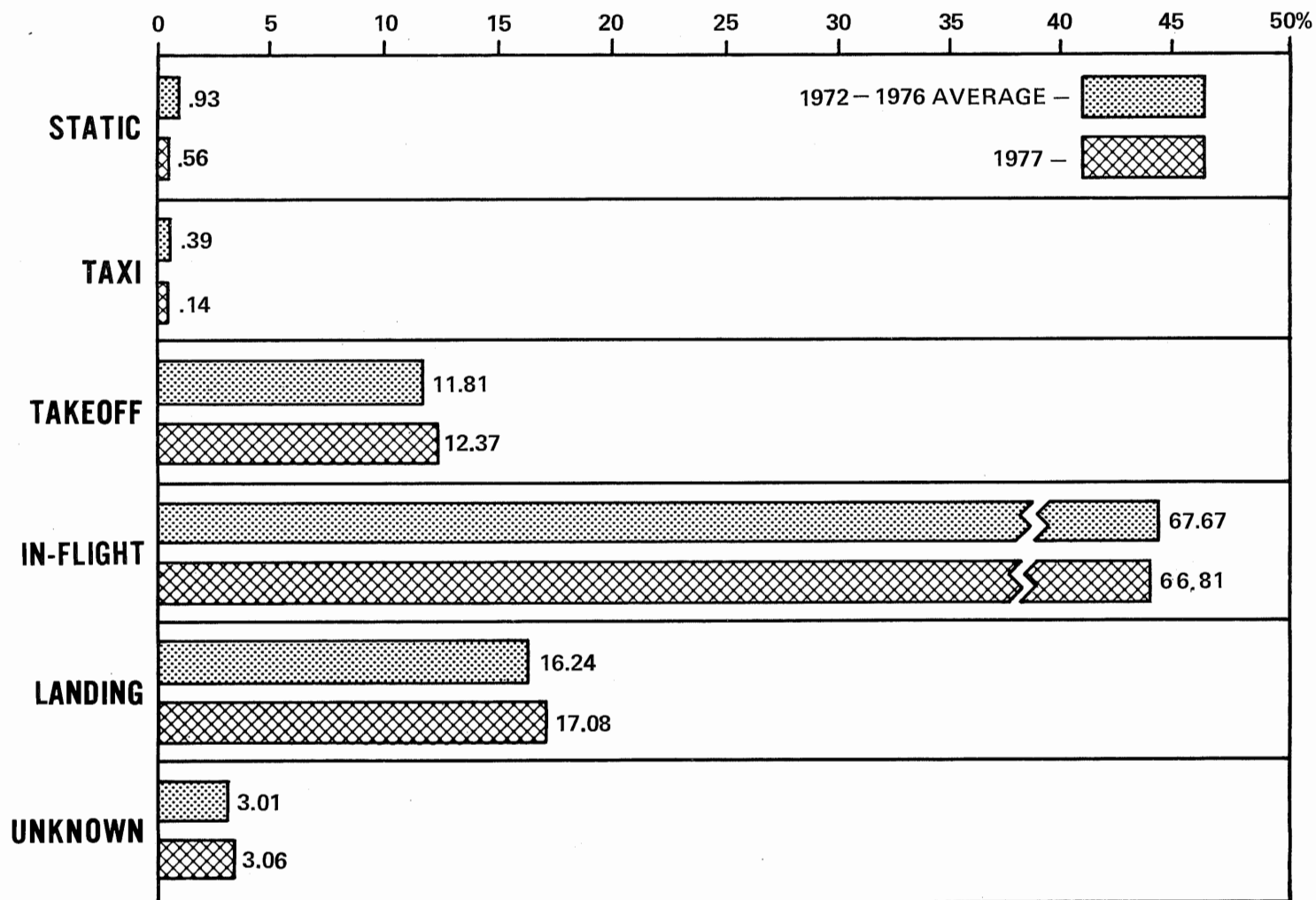
Table 5 - Fatal Accidents by Phase of Operation

<u>Phase of Operation</u>	<u>Number of Accident Records</u>	<u>Percent of Fatal Records</u>
Inflight	481	66.81
Landing	123	17.08
Takeoff	89	12.37
Static	4	0.56
Taxi	1	0.14

**Figure 5.--PERCENTAGE OF TOTAL ACCIDENTS PER PHASE OF OPERATION  
U.S. GENERAL AVIATION  
5-YEAR AVERAGE Vs. 1977**



**Figure 6.-- PERCENTAGE OF FATAL ACCIDENTS PER PHASE OF OPERATION  
U.S. GENERAL AVIATION  
5-YEAR AVERAGE Vs. 1977**



## Accident Causes/Factors

In 1977, the probable cause(s) was determined for 673 fatal accidents and 3,555 nonfatal accidents. The 10 most frequently cited causes or related factors of fatal and nonfatal accidents are listed by percentage and frequency of occurrence in Tables 6 and 7, respectively.

In accidents where fatalities occurred, 6 out of the 10 leading causal citations involved some type of human failure/error while 3 involved environmental conditions, and 1 is undetermined. No mechanical difficulty or aircraft malfunctions were included in the top 10.

The specific causal citation "Pilot - Failed to Obtain/Maintain Flying Speed" is the leading cause/factor in fatal accidents for 1977. This pilot causal factor was involved in 185 fatal accidents which resulted in 348 fatalities or 24.2 percent of the fatalities during 1977. This cause/factor was also the most frequently cited in 1976 and has been among the top three for several years in fatal accidents.

In nonfatal accidents, 5 of the 10 most frequently cited causal factors involve the pilot, while the remaining involve terrain (2), weather (1), and miscellaneous acts -- overload failure (1) and material failure (1). The highest pilot citation was, "inadequate preflight preparation or planning," recorded on 447 nonfatal accidents or 12.57 percent of the total.

Table 6. -- Ten Most Frequently Cited Causes/Factors of  
673 Fatal Accidents.  
- All Operations -

<u>10 Most Frequently Cited Causes/Factors</u>	<u>Frequency</u>	<u>Percent</u>
Pilot - Failed to Obtain/Maintain Flying Speed	185	27.49
Weather - Low Ceiling	137	20.36
Pilot - Continued VFR Flight into Adverse Weather Conditions	109	16.20
Weather - Fog	97	14.41
Pilot - Spatial Disorientation	95	14.12
Pilot - Inadequate Preflight Preparation or Planning	93	13.82
Terrain - High Obstructions	82	12.18
Pilot - Improper Inflight Decisions or Planning	74	11.00
Miscellaneous - Unwarranted Low Flying	71	10.55
Miscellaneous - Undetermined	52	7.73

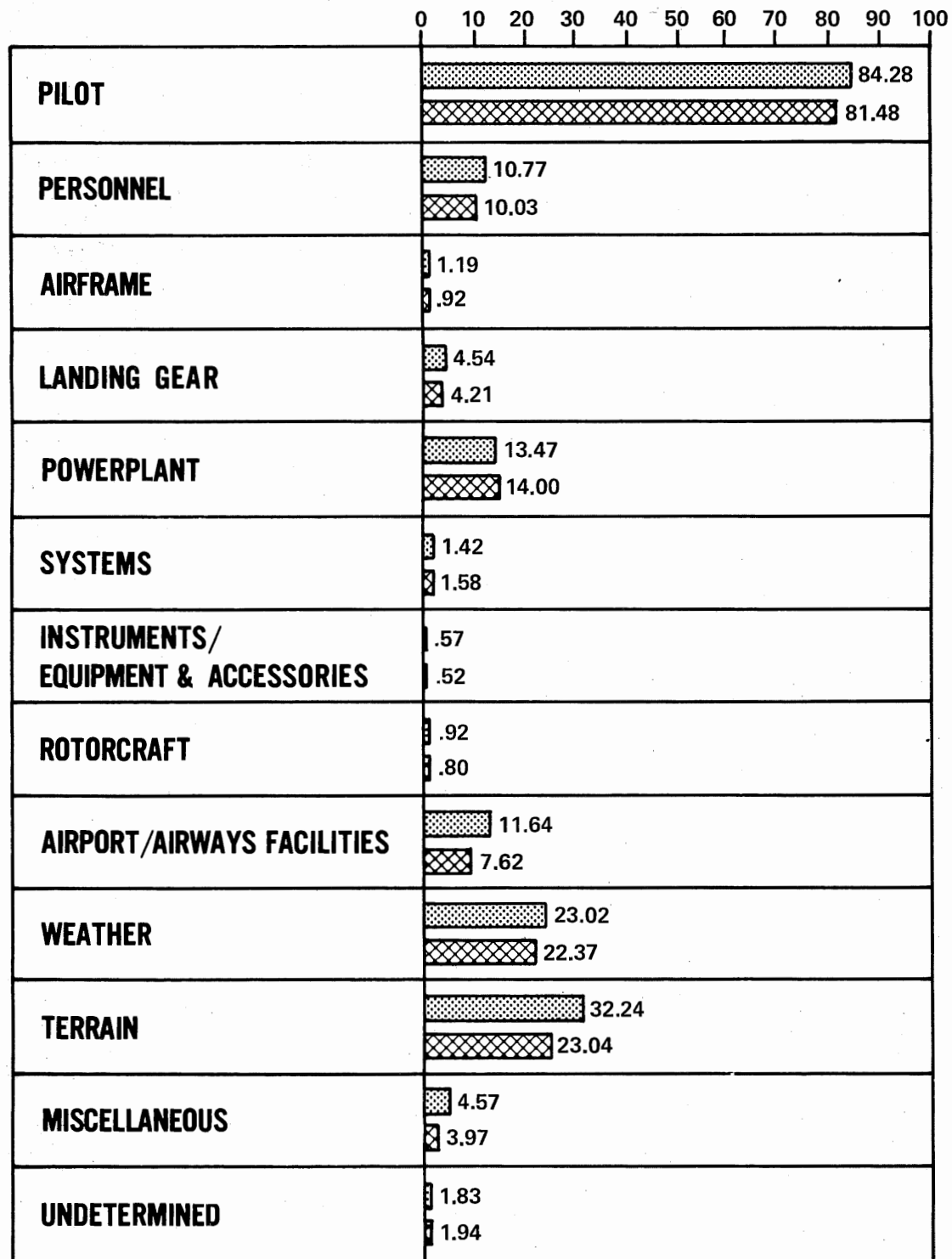


Table 7. -- Ten Most Frequently Cited Causes/Factors of  
3,555 Nonfatal Accidents  
- All Operations -

<u>10 Most Frequently Cited Causes/Factors</u>	<u>Frequency</u>	<u>Percent</u>
Pilot - Inadequate Preflight Preparation or Planning	447	12.57
Miscellaneous Acts, Conditions - Overload Failure	386	10.86
Pilot - Failed to Obtain/Maintain Flying Speed	367	10.32
Terrain - High Obstructions	346	9.73
Weather - Unfavorable Wind Conditions	301	8.47
Pilot - Failed to Maintain Directional Control	280	7.88
Pilot - Mismanagement of Fuel	261	7.34
Terrain - Rough/Uneven	247	6.95
Miscellaneous Acts, Conditions - Material Failure	229	6.44
Pilot - Selected Unsuitable Terrain	215	6.05

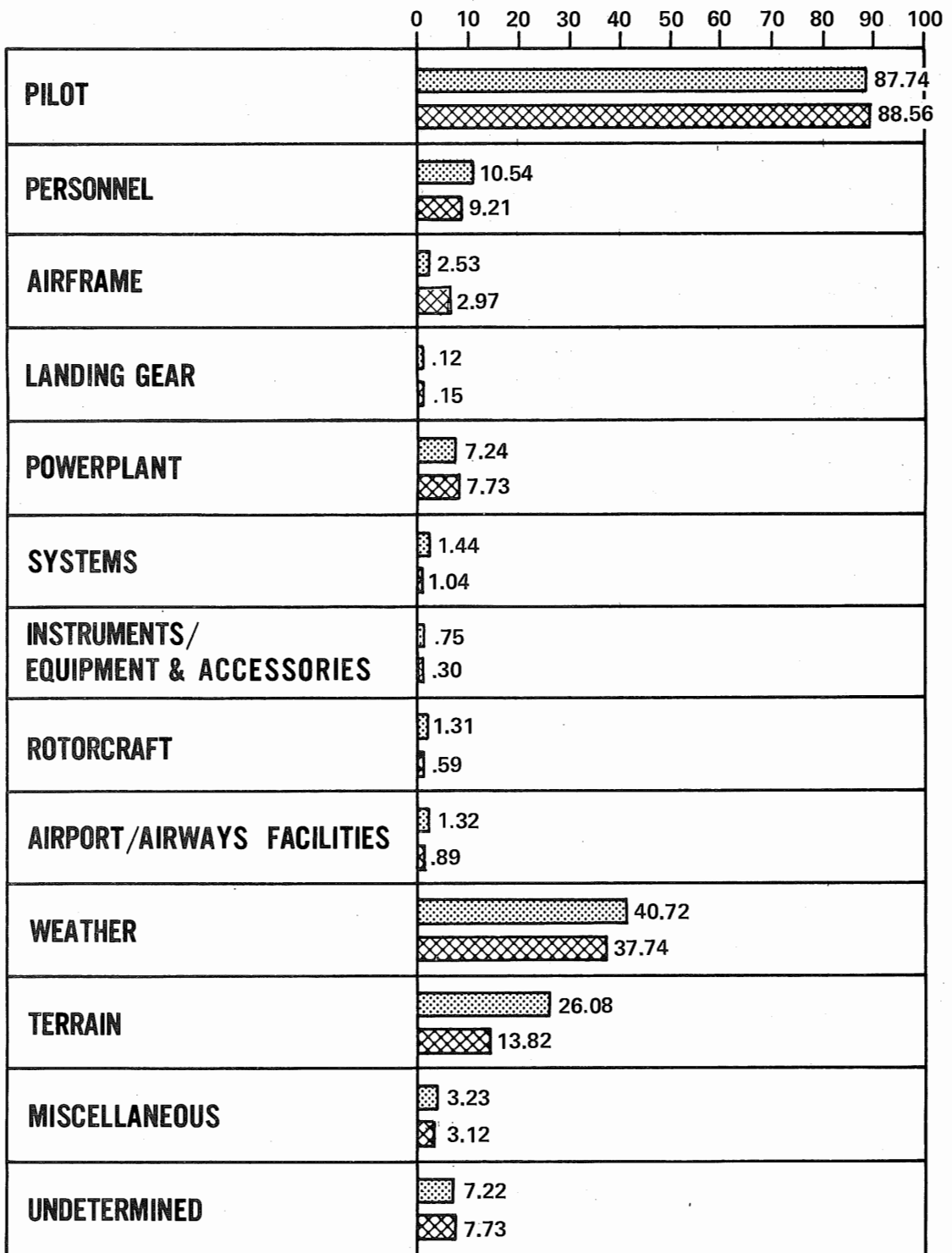
**Figure 7.-- TOTAL ACCIDENTS  
CAUSE OR RELATED FACTORS PERCENTAGE DISTRIBUTION  
U.S. GENERAL AVIATION**



**5-YEAR AVERAGE Vs. 1977**



1972 - 1976 AVERAGE -   
1977 - 

**Figure 8.-- FATAL ACCIDENTS  
CAUSE OR RELATED FACTORS PERCENTAGE DISTRIBUTION  
U.S. GENERAL AVIATION  
5-YEAR AVERAGE Vs. 1977**



1972-1976 AVERAGE —   
1977 — 

### Kind of Flying

Kinds of flying considered in this analysis were instructional, pleasure, business, corporate/executive, aerial application, and air taxi. The accident rates of corporate/executive for 1977 were the lowest of the kinds of flying considered. Corporate/executive has had the lowest rate per 100,000 aircraft hours flown for several years in U.S. general aviation. The rate for 1977 is 1.51 for total accident rate and 0.42 for fatal accident rate. Pleasure flying has the highest rates of all the kinds of flying in U.S. general aviation in both total and fatal accident rates; 18.45 total and 3.64 fatal for calendar year 1977. Figure 9 depicts pleasure and aerial application flying as above the total U.S. general aviation accident rate of 11.1. All the other kinds of flying, instructional, air taxi, business, and corporate/executive were below the average.

The fatal accident rates on table 9 and in figure 10 show only one kind of flying above the average of all fatal rates for kinds of flying in U.S. general aviation. This is pleasure flying and it has a fatal accident rate of 3.64 which is exactly twice the average of all kinds of flying fatal rate of 1.82. The other kinds of flying below the average are led by aerial application at rate 1.09, followed in turn by air taxi (1.05), instructional (0.79), business (0.69), and corporate/executive (0.42).

Table 8. -- Kind of Flying  
Total Accident Rates Per  
100,000 Aircraft-hours Flown

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Pleasure	23.82	21.05	20.37	18.45
Aerial Application	23.11	19.74	17.29	16.97
Instructional	11.71	10.51	9.59	9.42
Air Taxi	5.25	5.42	4.76	5.16
Business	4.95	4.79	4.06	3.89
Corporate/Executive	2.15	1.65	1.43	1.51

Table 9. -- Kind of Flying  
Fatal Accident Rates Per  
100,000 Aircraft-hours Flown

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Pleasure	4.49	3.99	3.88	3.64
Aerial Application	1.77	1.56	1.56	1.09
Air Taxi	1.10	0.95	1.17	1.05
Instructional	1.11	0.77	1.01	0.79
Business	1.02	0.96	0.85	0.69
Corporate/Executive	0.41	0.45	0.33	0.42

Figure 9.— KIND OF FLYING—TOTAL ACCIDENT  
RATES PER 100,000 AIRCRAFT—HOURS FLOWN  
1974—1977

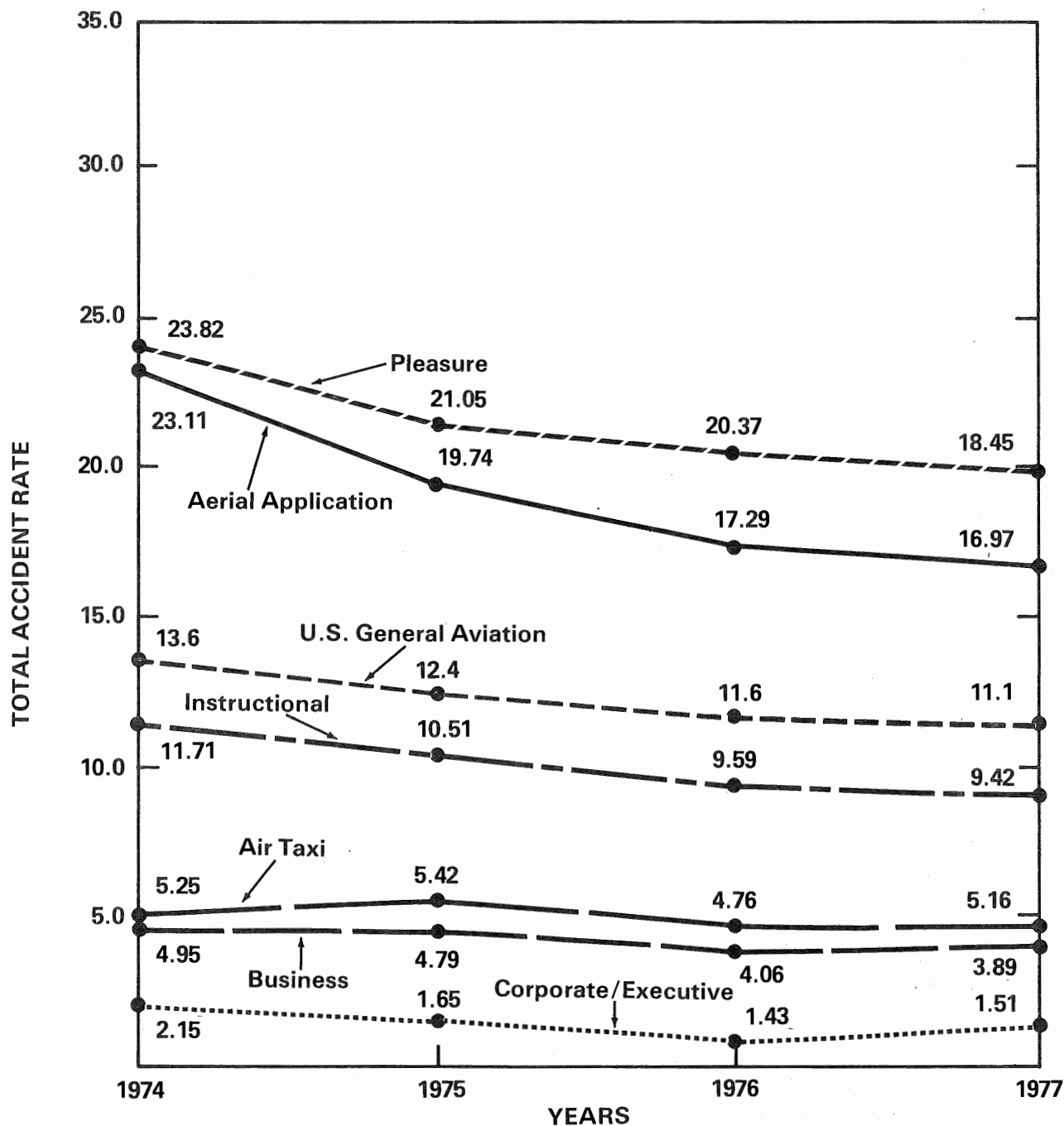
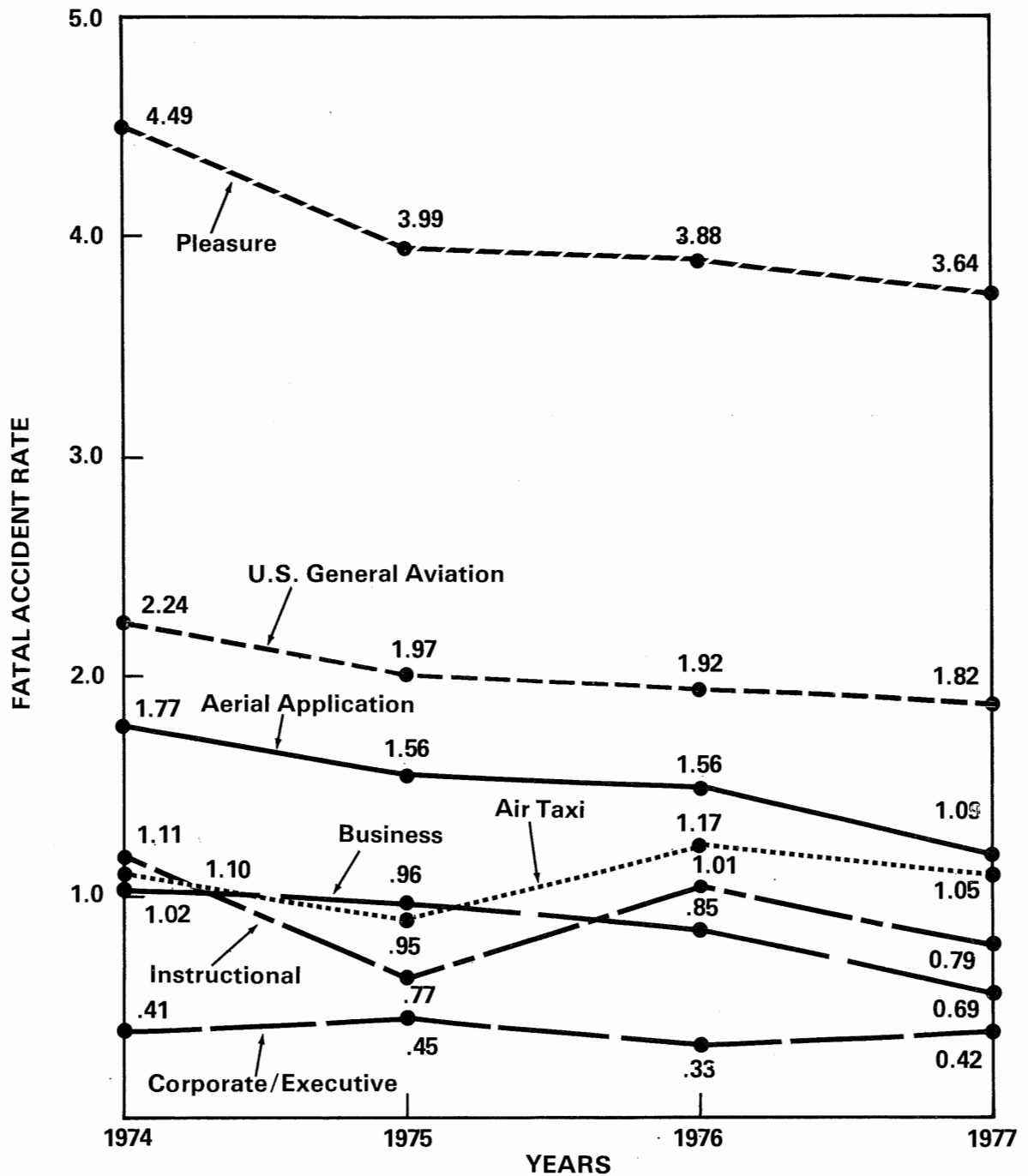


Figure 10.—KIND OF FLYING—FATAL ACCIDENT  
RATE PER 100,000 AIRCRAFT—HOURS FLOWN  
1974—1977



## Conclusions

1. The 1977 general aviation safety record showed an increase in the number of accidents but a decrease in rates when compared with 1976. The decline in accident rates continued a decreasing trend over the past 10 years.

- \* Total accidents increased from 4,193 during 1976 to 4,286 during 1977.
- \* Fatal accidents increased slightly from 695 (1976) to 702 (1977).
- \* Fatalities increased from 1,320 in 1976 to 1,436 during 1977.
- \* The total accident rate (per 100,000 hours) decreased from 11.6 (1976) to 11.1 (1977). This total accident rate is the lowest since 1938 when these data were first recorded.
- \* The fatal accident rate decreased from 1.92 in 1976 to 1.82 (per 100,000 hours) during 1977. The reduction below the 2.0 level to 1.82 is also the lowest fatal accident rate record.

2. The types of accidents that, because of their high occurrence rate, provide the most accident prevention potential are:

- \* Fatal Accidents

- collision with ground/water - controlled and uncontrolled
  - engine failure or malfunction
  - stall - spin
  - collided with trees
  - airframe failure in flight
  - stall

- \* Nonfatal Accidents

- engine failure or malfunction
  - groundloop
  - hard landing
  - stall - mush
  - overshoot
  - nose over/down



3. The phases of operation that are associated with the leading accident types listed above are:

\* Fatal Accidents

inflight - normal cruise  
inflight - uncontrolled descent  
takeoff - initial climb  
inflight - climb to cruise  
landing - final approach

\* Nonfatal Accidents

landing - level off/touchdown  
landing - roll  
landing - final approach - VFR

4. Pleasure kind of flying had the highest total and fatal accident rates during 1977. Corporate/executive flying had the lowest total and fatal accident rates. The pleasure flying rates were more than 10 times those of corporate/executive flying. Clearly, pleasure flying represents the activity that could profit most from accident prevention efforts and programs.
5. The pilot was cited as a causal factor in 89 percent of the fatal and 81 percent of the nonfatal accidents during 1977. The leading detailed pilot causal factors were:

\* Fatal Accidents

"failed to obtain/maintain flying speed"  
"continued VFR flight into adverse weather conditions"  
"spatial disorientation"  
"inadequate preflight preparation or planning"  
"improper inflight decisions or planning"

\* Nonfatal Accidents

"inadequate preflight preparation or planning"  
"failed to obtain/maintain flying speed"  
"failed to maintain directional control"  
"mismanagement of fuel"  
"selected unsuitable terrain"

Emphasis on accident prevention training and safety programs, with special attention to the specific pilot causal factors shown here, could have a positive influence on the safety record of general aviation and could reduce accident rates in this category of U.S. aviation.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING

—Chairman

/s/ ELWOOD T. DRIVER

Vice Chairman

/s/ FRANCIS H. MCADAMS

Member

/s/ PHILIP A. HOGUE

Member



## STATISTICAL INFORMATION



**GENERAL AVIATION ACCIDENTS**

**ALL CATEGORIES OF AIRCRAFT**



STATISTICAL RECAPITULATION OF ACCIDENTS  
U.S. GENERAL AVIATION  
1976-1977

	<u>1976</u>	<u>1977</u>
<u>Total Accidents</u>	4,193	4,286
<u>Aircraft Involved 1/</u>	4,241	4,337
<u>Injury Index</u>		
Fatal	695	702
Serious	422	424
Minor	565	627
None	2,511	2,533
Unknown	0	0
<u>Injuries 1/</u>		
Fatal	1,320	1,436
Serious	771	789
Minor	1,045	1,132
None	5,220	5,315
Unknown	1	0
<u>Total Aboard</u>	8,261	8,625
<u>Aircraft Damage 1/</u>		
Destroyed	1,095	1,126
Substantial	3,112	3,157
Minor/None	14	26
None	20	23
Not Reported	0	5
<u>Fire After Impact 1/</u>		
Fatal Accidents	196	190
Nonfatal Accidents	146	170
<u>Active Aircraft (Est.) 2/</u>	178,304	186,600
<u>Hours Flown(000) (Est.) 2/</u>	36,128	38,600
<u>Accident Rates Per 100,000 Hours Flown</u>		
Total	11.61	11.10
Fatal	1.92	1.82

1/ Includes all aircraft involved in collisions

2/ Source: FAA

Note: Suicide accident included in all computations except rates (1976-4, 1977-1).



# ACCIDENTS, RATES, ACTIVE AIRCRAFT

## ALL OPERATIONS

1977

	<u>Single*</u> <u>Engine</u>	<u>Multi-</u> <u>Engine</u>	<u>Glider</u>	<u>Ballon</u>	<u>Heli-</u> <u>copter</u>	<u>Gyro-</u> <u>copter</u>
ACCIDENTS	3,464	466	77	12	264	10
AIRCRAFT INVOLVED	3,506	466	78	12	264	10
<u>INJURY INDEX</u>						
Fatal	551	117	7	1	25	4
Serious	325	46	13	8	31	1
Minor	506	45	13	1	60	2
None	2,082	258	44	2	148	3
Unknown	0	0	0	0	0	0
ACTIVE AIRCRAFT (est.) <u>1/</u>	151,200	27,300	2,500	900		4,700
<u>AIRCRAFT DAMAGE</u>						
Destroyed	884	157	10	1	73	4
Substantial	2,592	303	65	4	187	6
Minor/None	30	6	3	7	4	0
Unknown/Not Reported	0	0	0	0	0	0
HOURS FLOWN (est.) <u>1/</u>	27,200,000	9,100,000	350,000	50,000		1,900,000
<u>ACCIDENT RATES PER</u> <u>100,000 HOURS FLOWN</u>						
Total	12.73	5.12	22.00	24.00		14.42
Fatal	2.02	1.29	2.00	2.00		1.53

\*Note: One suicide accident in single engine fixed-wing included in all computations except rate.

1/ Source: FAA

ACCIDENTS, RATES, INJURY INDEX, AIRCRAFT DAMAGE  
BY KIND OF FLYING  
ALL OPERATIONS  
1977

KIND OF FLYING

	NONCOMMERCIAL				AERIAL APPLICATION	COMMERCIAL			
	INSTRUCTIONAL	PLEASURE	BUSINESS	CORPORATE		AIR TAXI			
						SCHEDULED		NONSCHEDULED	
						PASSENGER	CARGO	PASSENGER	CARGO
ACCIDENTS	571	2129	299	64	452	23	14	116	64
HOURS FLOWN (THOUSANDS OF HOURS) 1/	6060.2	11541.4	7681.4	4246.0	2663.4			4207.4	
ACCIDENTS RATES PER 100,000 HOURS FLOWN									
Total Accidents	9.42	18.45	3.89	1.51	16.97			5.16	
Fatal Accidents	0.79	3.64	0.69	0.42	1.09			1.05	
ACCIDENT INJURY INDEX									
Fatal	48	420	53	18	29	6	2	22	14
Serious	45	206	24	6	52	3	3	11	7
Minor	83	326	32	7	56	2	3	17	11
None	395	1177	190	33	315	12	6	66	32
Unknown/Not Reported	0	0	0	0	0	0	0	0	0
AIRCRAFT DAMAGE									
Destroyed	90	559	80	26	148	9	4	27	23
Substantial	480	1561	217	37	306	13	10	83	40
Minor	3	10	2	1	0	1	0	3	1
None	2	13	0	0	2	0	0	3	0
Unknown/Not Reported	0	0	0	0	0	0	0	0	0

1/ Source: FAA

## ANALYTIC TABLE

FIRST TYPE OF ACCIDENT BY INJURY INDEX  
ALL OPERATIONS

FIRST TYPE OF ACCIDENT	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
GROUND-WATER LOOP-SWERVE	2	7	35	457	501	501	11.55
DROGGED WINGTIP POD OR FLOAT			2	9	11	11	.25
WHEELS-UP LANDING		1	1	69	71	71	1.64
WHEELS-DOWN LANDING IN WATER			2	7	9	9	.21
GEAR COLLAPSED			6	72	78	78	1.80
GEAR RETRACTED				52	52	52	1.20
HARD LANDING	3	15	24	209	251	251	5.79
NOSE OVER/DOWN			23	123	146	146	3.37
ROLL OVER			9	4	13	13	.30
OVERSHOOT	3	10	32	116	161	161	3.71
UNDERSHOOT	10	18	29	100	157	157	3.62
<u>COLLISION BETWEEN AIRCRAFT</u>							
BOTH IN FLIGHT	34	8	6	20	68	34	1.57
ONE AIRBORNE	2		4	4	10	5	.23
BOTH ON GROUND			4	19	23	12	.53
<u>COLLISION WITH GROUND/WATER</u>							
CONTROLLED	92	32	26	50	200	200	4.61
UNCONTROLLED	130	19	18	21	188	188	4.34
<u>COLLIDED WITH</u>							
WIRES/POLES	30	27	29	57	143	143	3.30
TRFES	48	40	18	65	171	171	3.94
RESIDENCE/S	3				3	3	.07
BUILDING/S		3		6	9	9	.21
FENCE, FENCEPOSTS	2	1	6	47	56	56	1.29
ELECTRONIC TOWERS				2	2	2	.05
RUNWAY OR APPROACH LIGHTS			1	5	6	6	.14
AIRPORT HAZARD				5	5	5	.12
ANIMALS				9	9	9	.21
CROP		2	1	22	25	25	.58
FLAGMAN LOADER		1			1	1	.02
DITCHES		2	3	22	27	27	.62
SNOWBANK			4	28	32	32	.74
PARKED AIRCRAFT (UNATTENDED)			4	16	20	20	.46
AUTOMOBILE		1	4	7	12	12	.28
DIRT BANK	2	2	5	32	41	41	.95
OTHER	7	3	3	64	77	77	1.78
BIRD STRIKE		1		1	2	2	.05

## ANALYTIC TABLE

FIRST TYPE OF ACCIDENT	FATAL SERIOUS MINOR NONE				RECORDS	ACCIDENTS	PERCENT
	FATAL	SERIOUS	MINOR	NONE			
STALL	39	33	19	48	139	139	3.21
SPIN	93	12	11	2	118	118	2.72
SPIRAL	11	4	3	1	19	19	.44
MISH	23	30	52	105	210	210	4.84
<u>FIRE OR EXPLOSION</u>							
IN FLIGHT	6			12	18	18	.42
ON GROUND				5	5	5	.12
<u>AIRFRAME FAILURE</u>							
IN FLIGHT	48	1	12	15	76	76	1.75
ON GROUND	1	1	1	11	14	14	.32
ENGINE TEARAWAY							
ENGINE FAILURE OR MALFUNCTION	94	127	222	582	1025	1025	23.64
PROPELLER/ROTOR FAILURE							
PROPELLER	2	4	3	18	27	27	.62
TAIL ROTOR		4	4	5	13	13	.30
MAIN ROTOR	2	1	1	4	8	8	.18
PROP ROTOR ACNT TO PERSON	5	11			16	16	.37
JET INTAKE/EXH ACNT TO PERS							
PROPELLER/JET/ROTOR BLAST				4	4	4	.09
TURBULENCE	1	3	4	10	18	18	.42
HAIL DAMAGE TO AIRCRAFT			1		1	1	.02
LIGHTNING STRIKE							
EVASIVE MANEUVER				1	1	1	.02
UNCONTROLLED ALT DEVIATION							
DITCHING	1			1	2	2	.05
MISSING ACFT NOT RECOVERED	12				12	12	.28
MISCELLANEOUS/OTHER	5	4	2	5	16	16	.37
UNDETERMINED	9			5	14	14	.32
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

FIRST TYPE OF ACCIDENT BY AIRCRAFT DAMAGE  
ALL OPERATIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
GROUND-WATER LOOP-SWERVE,	12	486	3		501	501	11.55
DRAGGED WINGTIP POD OR FLOAT	1	10			11	11	.25
WHEELS-UP LANDING	2	68	1		71	71	1.64
WHEELS-DOWN LANDING IN WATER	1	8			9	9	.21
GEAR COLLAPSED	1	76	1		78	78	1.80
GEAR RETRACTED	1	50	1		52	52	1.20
HARD LANDING	15	232	2	2	251	251	5.79
NOSE OVER/DOWN	4	142			146	146	3.37
ROLL OVER	6	7			13	13	.30
OVERSHOOT	14	147			161	161	3.71
UNDERSHOOT	20	137			157	157	3.62
<u>COLLISION BETWEEN AIRCRAFT</u>							
BOTH IN FLIGHT	28	32	6	2	68	34	1.57
ONE AIRBORNE	1	9			10	5	.23
BOTH ON GROUND	2	17	4		23	12	.53
<u>COLLISION WITH GROUND/WATER</u>							
CONTROLLED	112	87		1	200	200	4.61
UNCONTROLLED	151	37			188	188	4.34
<u>COLLIDED WITH</u>							
WIRES/POLES	63	79	1		143	143	3.30
TREES	82	88	1		171	171	3.94
RESIDENCE/S	3				3	3	.07
BUILDING/S	2	7			9	9	.21
FENCE, FENCEPOSTS	7	49			56	56	1.29
ELECTRONIC TOWERS		2			2	2	.05
RUNWAY OR APPROACH LIGHTS		6			6	6	.14
AIRPORT HAZARD		5			5	5	.12
ANIMALS	1	8			9	9	.21
CROP	2	23			25	25	.58
FLAGMAN LOADER				1	1	1	.02
DITCHES	4	22	1		27	27	.62
SNOWBANK		32			32	32	.74
PARKED AIRCRAFT (UNATTENDED)		19	1		20	20	.46
AUTOMOBILE	1	11			12	12	.28
DIRT BANK	5	36			41	41	.95
OTHER	9	67	1		77	77	1.78
BIRD STRIKE		1	1		2	2	.05

## ANALYTIC TABLE

	<div>DESTROYED</div> <div>SUBSTANTIAL</div> <div>MINOR</div> <div>NONE</div>				RECORDS	ACCIDENTS	PERCENT
STALL	61	78			139	139	3.21
SPIN	103	15			118	118	2.72
SPIRAL	14	5			19	19	.44
MUSH	67	143			210	210	4.84
<u>FIRE OR EXPLOSION</u>							
IN FLIGHT	12	6			18	18	.42
ON GROUND	2	3			5	5	.12
<u>AIRFRAME FAILURE</u>							
IN FLIGHT	52	24			76	76	1.75
ON GROUND	2	12			14	14	.32
ENGINE TEARAWAY							
ENGINE FAILURE OR MALFUNCTION	222	803			1025	1025	23.64
PROPELLER/ROTOR FAILURE							
PROPELLER	6	21			27	27	.62
TAIL ROTOR	2	11			13	13	.30
MAIN ROTOR	3	5			8	8	.18
PROP ROTOR ACNT TO PERSON			3	13	16	16	.37
JET INTAKE/EXH ACNT TO PERS							
PROPELLER/JET/ROTOR BLAST		4			4	4	.09
TURBULENCE	6	11		1	18	18	.42
HAIL DAMAGE TO AIRCRAFT		1			1	1	.02
LIGHTNING STRIKE							
EVASIVE MANEUVER		1			1	1	.02
UNCONTROLLED ALT DEVIATION							
DITCHING	2				2	2	.05
MISSING ACFT NOT RECOVERED	12				12	12	.28
MISCELLANEOUS/OTHER	4	9		3	16	16	.37
UNDETERMINED	9	5			14	14	.32
RECORDS	1129	3157	27	23	4336		
ACCIDENTS	1119	3138	27	23		4286	
PERCENTS	26.0	72.8	.6	.5			









### FIRST ACCIDENT TYPE BY SECOND ACCIDENT TYPE

[illegible]

**NOTE: INCLUDES ALL AIRCRAFT RECORDS INVOLVED IN COLLISIONS.**

## FIRST ACCIDENT TYPE BY FIRST OPERATIONAL PHASE U.S. GENERAL AVIATION 1977

		FIRST TYPE OF ACCIDENT																																																											
FIRST PHASE OF OPERATION		TOTAL FIRST OPERATIONAL PHASES																		Collided with																			Fire or explosion													Airframe failure									
STATIC		Ground/water loop/swept Dragged wingtip, pod, or float Wheels-up landing Wheels-down landing Gear collapsed Gear retracted Hard landing Nose over/down Roll over Overshoot Undershoot Bath in flight One engine Both on ground Controlled Uncontrolled Wings/poles Trees Residence(s) Other buildings Fence, fenceposts Electronic towers Runway or approach lights Airport hazard Animals Crop Flagman, ladder Ditches Snowbank Parked aircraft (unattended, engines not running) Automobile Dirt bank Other Bird strike [collision with birds] Stall Spin Skid Mush In flight On ground In flight On ground Engine tearaway Engine failure or malfunction Propeller/rotor failure Power Tail rotor Main rotor Propeller/rotor acc. to person Jet intake/exhaust acc. to person Turbulence Hail damage to aircraft Lightning strike Evasive maneuver Uncontrolled altitude deviations Ditching Missing aircraft, not recovered Other/miscellaneous Undetermined																		Collision * with aircraft  Collision with ground/ water																			Fire or explosion  Airframe failure													Engine tearaway Engine failure or malfunction Propeller/rotor failure Power Tail rotor Main rotor Propeller/rotor acc. to person Jet intake/exhaust acc. to person Turbulence Hail damage to aircraft Lightning strike Evasive maneuver Uncontrolled altitude deviations Ditching Missing aircraft, not recovered Other/miscellaneous Undetermined									
STARTING ENGINE/S																																																													
IDLING ENGINE/S																																																													
ENGINE RUNUP																																																													
IDLING ROTORS																																																													
PARKED-ENGINES NOT OPERATING																																																													
OTHER																																																													
TAXI																																																													
TO TAKEOFF																																																													
FROM LANDING																																																													
OTHER																																																													
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																																																													
INITIAL CLIMB																																																													
VERTICAL																																																													
RUNNING (ROTORCRAFT/VTOL-STOL)																																																													
ABORTED (FIXED-WING)																																																													
ABORTED (ROTORCRAFT/VTOL)																																																													
ABORTED (ROTORCRAFT/STOL)																																																													
OTHER																																																													
INFLIGHT																																																													
CLIMB TO CRUISE																																																													
NORMAL CRUISE																																																													
DESCENDING																																																													
HOLDING (IFR)																																																													
HOVERING																																																													
POWER-ON DESCENT (ROTORCRAFT)																																																													
AUTOROTATIVE DESCENT																																																													
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)																																																													
INITIAL APPROACH																																																													
FINAL APPROACH (IFR)																																																													
LEVEL OFF/TOUCHDOWN																																																													
ROLL (FIXED WING)																																																													
ROLL-ON/RUN-ON (ROTORCRAFT)																																																													
POWER-ON LANDING (ROTORCRAFT)																																																													
POWER-OFF AUTOROTATIVE LDG																																																													
GO-AROUND (VFR)																																																													
MISSED APPROACH (IFR)																																																													
OTHER																																																													
UNKNOWN/NOT REPORTED																																																													
TOTAL FIRST ACCIDENT TYPE																																																													

**\*NOTE: INCLUDES ALL AIRCRAFT INVOLVED IN COLLISIONS**

## ANALYTIC TABLE

FIRST PHASE OF OPERATION BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>STATIC</u>							
STARTING ENGINE/S		1		4	5	5	.12
IDLING ENGINE/S	4	7		3	14	14	.32
ENGINE RUNUP			1	1	2	2	.05
IDLING ROTORS		1		2	3	3	.07
PARKED-ENGINES NOT OPERATING							
OTHER			1		1	1	.02
<u>TAXI</u>							
TO TAKEOFF		1	3	41	45	43	1.04
FROM LANDING	1		3	61	65	64	1.50
OTHER		1	4	22	27	27	.62
GROUND TAXI TO TAKEOFF				1	1	1	.02
GROUND TAXI FROM LANDING			1	1	2	2	.05
GROUND TAXI, OTHER			1		1	1	.02
AERIAL TAXI TO TAKEOFF				3	3	3	.07
AERIAL TAXI TO/FROM LANDING				1	1	1	.02
AERIAL TAXI, OTHER		2		3	5	5	.12
<u>TAKEOFF</u>							
RUN	3	5	23	198	229	229	5.28
INITIAL CLIMB	83	87	93	284	547	547	12.62
VERTICAL		2	9	17	28	28	.65
RUNNING (ROTORCRAFT/VTOL-STOL)			2	2	4	4	.09
ABORTED (FIXED-WING)		2	8	49	59	59	1.36
ABORTED (ROTORCRAFT/VTOL)				2	2	2	.05
ABORTED (ROTORCRAFT/STOL)							
OTHER	3	1			4	4	.09
<u>INFLIGHT</u>							
CLIMB TO CRUISE	44	17	25	39	125	125	2.88
NORMAL CRUISE	137	68	104	235	544	539	12.55
DESCENDING	14	10	20	44	88	87	2.03
HOLDING (IFR)							
HOVERING	1	6	4	8	19	19	.44
POWER-ON DESCENT (ROTORCRAFT)		1	1		2	2	.05
AUTOROTATIVE DESCENT				3	3	3	.07
ACROBATICS	29	2	2	6	39	38	.90
BUZZING	35	7	8	4	54	54	1.25
UNCONTROLLED DESCENT	104	3	5	3	115	115	2.65

## ANALYTIC TABLE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
EMERGENCY DESCENT				1	1	1	.02
LOW PASS	28	13	10	28	79	78	1.82
OTHER	61	12	16	27	116	114	2.68
EN ROUTE TO TREAT CROP	1		8	9	18	18	.42
EN ROUTE TO RELOADING AREA	2			6	8	8	.18
SURVEY FIELD/AREA			1	2	3	3	.07
STARTING SWATH RUN	2	10	9	16	37	36	.85
SWATH RUN	3	5	7	47	62	62	1.43
FLAREOUT FOR SWATH RUN				2	2	2	.05
PULLUP FROM SWATH RUN	5	8	3	25	41	41	.95
PROCEDURE TURNAROUND	13	13	14	43	83	82	1.91
CLEANUP SWATH		3	3	3	9	9	.21
MANEUVER TO AVOID OBSTRUCTION			2	1	3	3	.07
RETURN TO STRIP	2	1	1	9	13	12	.30
<u>LANDING</u>							
TRAFFIC PATTERN-CIRCLING	30	21	15	29	95	93	2.19
FINAL APPROACH (VFR)	33	47	68	164	312	304	7.20
INITIAL APPROACH	6	1	2	1	10	10	.23
FINAL APPROACH (IFR)	16	5	6	5	32	32	.74
LEVEL OFF/TOUCHDOWN	8	31	79	487	605	603	13.95
ROLL (FIXED WING)	2	6	34	511	553	550	12.75
ROLL-ON/RUN-ON (ROTORCRAFT)	1			1	2	2	.05
POWER-ON LANDING (ROTORCRAFT)		4	5	13	22	22	.51
POWER-OFF AUTOROTATIVE LDG			3	10	13	13	.30
GO-AROUND (VFR)	16	20	26	66	128	128	2.95
MISSED APPROACH (IFR)	7	2	1	1	11	11	.25
OTHER	4	1	1	4	10	10	.23
UNKNOWN/NOT REPORTED	22	1	2	6	31	31	.71
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

FIRST PHASE OF OPERATION BY AIRCRAFT DAMAGE  
ALL OPERATIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>STATIC</u>							
STARTING ENGINE/S	1	3		1	5	5	.12
IDLING ENGINE/S		3		11	14	14	.32
ENGINE RUNUP		2			2	2	.05
IDLING ROTORS		2	1		3	3	.07
PARKED-ENGINES NOT OPERATING							
OTHER		1			1	1	.02
<u>TAXI</u>							
TO TAKEOFF	1	41	3		45	43	1.04
FROM LANDING	3	60	2		65	64	1.50
OTHER	2	23	1	1	27	27	.62
GROUND TAXI TO TAKEOFF		1			1	1	.02
GROUND TAXI FROM LANDING		2			2	2	.05
GROUND TAXI, OTHER		1			1	1	.02
AERIAL TAXI TO TAKEOFF	1	2			3	3	.07
AERIAL TAXI TO/FROM LANDING		1			1	1	.02
AERIAL TAXI, OTHER	1	4			5	5	.12
<u>TAKEOFF</u>							
RUN	14	214	1		229	229	5.28
INITIAL CLIMB	177	369	1		547	547	12.62
VERTICAL	7	21			28	28	.65
RUNNING (ROTORCRAFT/VTOL-STOL)	1	3			4	4	.09
ABORTED (FIXED-WING)	4	53	2		59	59	1.36
ABORTED (ROTORCRAFT/VTOL)		2			2	2	.05
ABORTED (ROTORCRAFT/STOL)							
OTHER	4				4	4	.09
<u>INFLIGHT</u>							
CLIMB TO CRUISE	58	67			125	125	2.88
NORMAL CRUISE	195	344	4	1	544	539	12.55
DESCENDING	24	64			88	87	2.03
HOLDING (IFR)							
HOVERING	8	10		1	19	19	.44
POWER-ON DESCENT (ROTORCRAFT)	1	1			2	2	.05
AUTOROTATIVE DESCENT		3			3	3	.07
ACROBATICS	28	11			39	38	.90
BUZZING	38	16			54	54	1.25
UNCONTROLLED DESCENT	101	14			115	115	2.65

## ANALYTIC TABLE

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
EMERGENCY DESCENT	1				1	1	.02
LOW PASS	34	45			79	78	1.82
OTHER	69	47			116	114	2.68
EN ROUTE TO TREAT CRCP	5	13			18	18	.42
EN ROUTE TO RELOADING AREA	3	5			8	8	.18
SURVEY FIELD/AREA	3				3	3	.07
STARTING SWATH RUN	16	20	1		37	36	.85
SWATH RUN	19	43			62	62	1.43
FLAREOUT FOR SWATH RUN		2			2	2	.05
PULLUP FROM SWATH RUN	19	22			41	41	.95
PROCEDURE TURNAROUND	40	43			83	82	1.91
CLEANUP SWATH	5	4			9	9	.21
MANEUVER TO AVOID OBSTRUCTION	2	1			3	3	.07
RETURN TO STRIP	4	9			13	12	.30
<u>LANDING</u>							
TRAFFIC PATTERN-CIRCLING	39	56			95	93	2.19
FINAL APPROACH (VFR)	53	256	1	2	312	304	7.20
INITIAL APPROACH	7	3			10	10	.23
FINAL APPROACH (IFR)	23	9			32	32	.74
LEVEL OFF/TOUCHDOWN	35	560	5	5	605	603	13.95
ROLL (FIXED WING)	14	533	6		553	550	12.75
ROLL-ON/RUN-ON (ROTORCRAFT)	1	1			2	2	.05
POWER-ON LANDING (ROTORCRAFT)	3	19			22	22	.51
POWER-OFF AUTOMATIC LDG	1	12			13	13	.30
GO-AROUND (VFR)	35	93			128	128	2.95
MISSED APPROACH (IFR)	8	3			11	11	.25
OTHER	4	6			10	10	.23
UNKNOWN/NOT REPORTED	21	10			31	31	.71
OTHER							
RECORDS	1129	3157	27	23	4336		
ACCIDENTS	1119	3138	27	23		4286	
PERCENTS	26.0	72.8	.6	.5			

## CAUSE/FACTOR TABLE

U.S. GENERAL AVIATION ACCIDENTS  
ALL OPERATIONS  
1977

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 4228 TOTAL ACCIDENTS

INVOLVES 673 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	588 87.37	121 17.98	596 88.56	2823 79.41	319 8.97	2849 80.14	3411 80.68	440 10.41	3445 81.48
PERSONNEL	46 6.84	19 2.82	62 9.21	307 8.64	64 1.80	362 10.18	353 8.35	83 1.96	424 10.03
AIRFRAME	5 .74	15 2.23	20 2.97	14 .39	5 .14	19 .53	19 .45	20 .47	39 .92
LANDING GEAR	1 .15		1 .15	153 4.30	26 .73	177 4.98	154 3.64	26 .61	178 4.21
POWERPLANT	43 6.39	11 1.63	52 7.73	515 14.49	32 .90	540 15.19	558 13.20	43 1.02	592 14.00
SYSTEMS	5 .74	2 .30	7 1.04	40 1.13	20 .56	60 1.69	45 1.06	22 .52	67 1.58
INSTRUMENTS/EQUIPMENT & ACCESSORIES	1 .15	1 .15	2 .30	3 .08	17 .48	20 .56	4 .09	18 .43	22 .52
ROTORCRAFT	4 .59		4 .59	29 .82	1 .03	30 .84	33 .78	1 .02	34 .80
AIRPORT/AIRWAYS/FACILITIES		6 .89	6 .89	41 1.15	280 7.88	316 8.89	41 .97	286 6.76	322 7.62
WEATHER	7 1.04	248 36.85	254 37.74	74 2.08	627 17.64	692 19.47	81 1.92	875 20.70	946 22.37
TERRAIN	9 1.34	84 12.48	93 13.82	304 8.55	579 16.29	881 24.78	313 7.40	663 15.68	974 23.04
MISCELLANEOUS	18 2.67	3 .45	21 3.12	125 3.52	24 .68	147 4.14	143 3.38	27 .64	168 3.97
UNDETERMINED	52 7.73		52 7.73	30 .84		30 .84	82 1.94		82 1.94

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. GENERAL AVIATION ACCIDENTS  
ALL OPERATIONS  
1977

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 4228 TOTAL ACCIDENTS

INVOLVES 673 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	7	6	13	28	9	37	35	15	50
ATTEMPTED OPERATION BEYOND EXPERIENCE/ABILITY LEVEL	41	16	57	39	16	55	80	32	112
BECAME LOST/DISORIENTED	8	1	9	39	8	47	47	9	56
CONTINUED VFR FLIGHT INTO ADVERSE WEATHER CONDITIONS	105	4	109	52	6	58	157	10	167
CONTINUED INTO KNOWN AREA OF SEVERE TURBULENCE	3		3	3		3	6		6
DELAYED ACTION IN ABORTING TAKEOFF				46	1	47	46	1	47
DELAYED IN INITIATING GO-AROUND	6	2	8	97	12	109	103	14	117
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT	17	1	18	64	23	87	81	24	105
EXCEEDED DESIGN STRESS LIMITS OF AIRCRAFT	31		31	3		3	34		34
FAILED TO EXTEND LANDING GEAR				33		33	33		33
FAILED TO RETRACT LANDING GEAR				7	1	8	7	1	8
RETRACTED GEAR PREMATURELY				5		5	5		5
INADVERTENTLY RETRACTED GEAR				17		17	17		17
FAILED TO SEE AND AVOID OTHER AIRCRAFT	29		29	45	2	47	74	2	76
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS	33		33	122	2	124	155	2	157
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	185		185	366	1	367	551	1	552
MISJUDGED, SPEED, ALTITUDE OR CLEARANCE	3		3	22		22	25		25
FAILED TO MAINTAIN ADEQUATE ROTOR RPM	5		5	33		33	38		38
FAILED TO USE OR INCORRECTLY USED MISC EQUIPMENT	2		2	4	1	5	6	1	7
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC	14	9	23	48	14	62	62	23	85
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS	10	4	14	92	13	105	102	17	119
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				170	2	172	170	2	172
IMPROPER OPERATION OF FLIGHT CONTROLS	36	2	38	86	8	94	122	10	132
PREMATURE LIFT OFF	4		4	41	2	43	45	2	47
IMPROPER LEVEL OFF	1	1	2	206	3	209	207	4	211
IMPROPER IFR OPERATION	20	1	21	10		10	30	1	31
IMPROPER IN-FLIGHT DECISIONS OR PLANNING	67	7	74	162	9	171	229	16	245
IMPROPER COMPENSATION FOR WIND CONDITIONS		1	1	143	9	152	143	10	153
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING	72	21	93	399	48	447	471	69	540
INADEQUATE SUPERVISION OF FLIGHT	9	1	10	82	6	88	91	7	98
LACK OF FAMILIARITY WITH AIRCRAFT	5	24	29	49	73	122	54	97	151
MISMANAGEMENT OF FUEL	34		34	261		261	295		295
EXERCISED POOR JUDGMENT	29	8	37	43	4	47	72	12	84
OPERATED CARELESSLY	2		2	1		1	3	4	7
SELECTED UNSUITABLE TERRAIN	5		5	200	15	215	205	15	220
IMPROPER STARTING PROCEDURES				3		3	3		3
STARTED ENGINE WITHOUT PROPER ASSISTANCE/EQUIPMENT				15	1	16	15	1	16
TAXIED/PARKED WITHOUT PROPER ASSISTANCE				13		13	13		13
FAILED TO ASSURE THE GEAR WAS DOWN AND LOCKED				24		24	24		24
INITIATED FLIGHT IN ADVERSE WEATHER CONDITIONS	31	1	32	23	3	26	54	4	58
CONTROL INTERFERENCE	1		1				1		1
SPONTANEOUS-IMPROPER ACTION				10		10	10		10
MISJUDGED DISTANCE, SPEED, AND ALTITUDE	10	1	11	31	1	32	41	2	43
MISJUDGED DISTANCE AND SPEED	3		3	164	8	172	167	8	175
MISJUDGED DISTANCE	1		1	4		4	5		5
MISJUDGED DISTANCE AND ALTITUDE	6		6	114	4	118	120	4	124
MISJUDGED SPEED AND ALTITUDE				15	2	17	15	2	17
MISJUDGED SPEED				8	2	10	8	2	10
MISJUDGED SPEED AND CLEARANCE	2		2	5		5	7		7
MISJUDGED ALTITUDE AND CLEARANCE	17		17	29		29	46		46
MISJUDGED ALTITUDE	19		19	19		19	38		38
MISJUDGED CLEARANCE	13		13	92		92	105		105
INADEQUATE TRAINING OF STUDENT				2	2	4	2	2	4
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS	1		1	3	1	4	4	1	5
IMPROPER RECOVERY FROM BOUNCED LANDING		1	1	112	5	117	112	6	118
INCAPACITATION	9		9	2		2	11		11
PHYSICAL IMPAIRMENT	23	21	44	4	4	8	27	25	52
SPATIAL DISORIENTATION	95		95	14		14	109		109
PSYCHOLOGICAL CONDITION	1		1				1		1

## CAUSE/FACTOR TABLE

## MISUSED OR FAILED TO USE FLAPS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
MISUSED OR FAILED TO USE FLAPS	5	4	9	27	14	41	32	18	50
FAILED TO MAINTAIN DIRECTIONAL CONTROL	1		1	280	1	280	281	1	281
SELECTED WRONG RUNWAY RELATIVE TO EXISTING WIND	2	2	4	55	8	63	57	10	67
FAILED TO ABORT TAKEOFF	7		7	61	4	65	68	4	72
FAILED TO INITIATE GO-AROUND	3		3	131	11	142	134	11	145
DIRECT ENTRIES	1		1				1		1
SUBTOTAL	1034	139	1173	4278	363	4641	5312	502	5814
COPILOT									
DELAYED IN INITIATING GO-AROUND	1		1				1		1
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	1		1				1		1
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				1		1	1		1
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				2		2	2		2
IMPROPER OPERATION OF FLIGHT CONTROLS	1		1				1		1
IMPROPER COMPENSATION FOR WIND CONDITIONS	1		1				1		1
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING				1		1	1		1
LACK OF FAMILIARITY WITH AIRCRAFT	1	1	2				1	1	2
MISMANAGEMENT OF FUEL				1		1	1		1
FAILURE TO RELINQUISH CONTROL	1		1				1		1
CONTROL INTERFERENCE				1		1	1		1
SPONTANEOUS-IMPROPER ACTION				1		1	1		1
MISJUDGED DISTANCE AND ALTITUDE				2		2	2		2
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS				1		1	1		1
PHYSICAL IMPAIRMENT	1	1	2				1	1	2
SUBTOTAL	7	2	9	10		10	17	2	19
DUAL STUDENT									
CONTINUED VFR FLIGHT INTO ADVERSE WEATHER CONDITIONS				1		1	1		1
DELAYED ACTION IN ABORTING TAKEOFF				1		1	1		1
DELAYED IN INITIATING GO-AROUND				1		1	1		1
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT				1		1	1		1
FAILED TO EXTEND LANDING GEAR				1		1	1		1
INADVERTENTLY RETRACTED GEAR				2		2	2		2
FAILED TO SEE OTHER AIRCRAFT				1		1	1		1
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS				2		2	2		2
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	4		4	6		6	10		10
MISJUDGED DISTANCE, SPEED, ALTITUDE OR CLEARANCE				1		1	1		1
FAILED TO MAINTAIN ADEQUATE ROTOR RPM				3		3	3		3
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				2		2	2		2
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				5		5	5		5
IMPROPER OPERATION OF FLIGHT CONTROLS				12		12	12		12
PREMATURE LIFT-OFF				1		1	1		1
IMPROPER LEVEL OFF				9		9	9		9
IMPROPER IN-FLIGHT DECISIONS OR PLANNING				1		1	1		1
IMPROPER COMPENSATION FOR WIND CONDITIONS				5		5	5		5
LACK OF FAMILIARITY WITH AIRCRAFT					1	1		1	1
SELECTED UNSUITABLE TERRAIN				1		1	1		1
FAILURE TO RELINQUISH CONTROL				5		5	5		5
CONTROL INTERFERENCE				4		4	4		4
SPONTANEOUS-IMPROPER ACTION				3		3	3		3
MISJUDGED DISTANCE, SPEED, AND ALTITUDE					1	1		1	1
MISJUDGED DISTANCE AND SPEED				3		3	3		3
MISJUDGED DISTANCE AND ALTITUDE	1		1	12		12	13		13
MISJUDGED SPEED AND ALTITUDE				3		3	3		3
MISJUDGED CLEARANCE				2		2	2		2
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS				2		2	2		2
IMPROPER RECOVERY FROM BOUNCED LANDING	1		1	1		1	2		2
SPATIAL DISORIENTATION	1		1				1		1
MISUSED OR FAILED TO USE FLAPS				2		2	2		2
FAILED TO MAINTAIN DIRECTIONAL CONTROL				10		10	10		10
FAILED TO ABORT TAKEOFF				1		1	1		1
FAILED TO INITIATE GO-AROUND				3		3	3		3
SUBTOTAL	7		7	107	2	109	114	2	116
CHECK PILOT									
INADEQUATE SUPERVISION OF FLIGHT				2	1	3	2	1	3
SUBTOTAL				2	1	3	2	1	3

\*\* PERSONNEL \*\*

FLIGHT INSTRUCTOR

## CAUSE/FACTOR TABLE

## PERSONNEL (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
INADEQUATE SUPERVISION OF FLIGHT		2	2	14	1	15	14	3	17
INADEQUATE TRAINING OF STUDENT				2	6	8	2	6	8
MAINTENANCE, SERVICING, INSPECTION									
IMPROPER MAINTENANCE(MAINTENANCE PERSONNEL)	4		4	44	2	46	48	2	50
IMPROPER MAINTENANCE(OWNER PERSONNEL)	1	1	2	15	1	16	16	2	18
IMPROPERLY SERVICED AIRCRAFT(GROUND CREW)		1	1	2	3	5	2	4	6
IMPROPERLY SERVICED AIRCRAFT(OWNER-PILOT)				4		4	4		4
INADEQUATE INSPECTION OF AIRCRAFT(MAINTENANCE PERSONNEL)	4		4	14	2	16	18	2	20
INADEQUATE INSPECTION OF ACFT(OWNER-PILOT PERSONNEL)		1	1	7	3	10	7	4	11
INADEQUATE MAINTENANCE AND INSPECTION	10	2	12	96	18	114	106	20	126
OTHER				3		3	3		3
UNK/NR				2		2	2		2
OPERATIONAL SUPERVISORY PERSONNEL									
INADEQUATE SUPERVISION OF FLIGHT CREW		1	1	2		2	2	1	3
INADEQUATE SUPERVISION/TRAINING OF RAMP CREWS				1	1	2	1	1	2
FAILURE TO PROVIDE ADEQ DIRECTIVES, MANUALS, EQUIPMENT				4	1	5	4	1	5
DEFICIENCY, COMPANY MAINTAINED EQMT, SERV, REGULATIONS		1	1	6	3	9	6	4	10
WEATHER PERSONNEL									
INCORRECT WEATHER FORECAST	1	3	4				1	3	4
TRAFFIC CONTROL PERSONNEL									
FAILURE OR DELAY IN INITIATING EMERGENCY PROCEDURES					1	1		1	1
FAILURE TO ADVISE OF UNSAFE WEATHER CONDITION		1	1					1	1
FAILURE TO ADVISE OF OTHER TRAFFIC					2	2		2	2
ISSUED IMPROPER OR CONFLICTING INSTRUCTIONS		1	1	3		3	3	1	4
INADEQUATE SPACING OF AIRCRAFT					2	2		2	2
OTHER		1	1	2	1	3	2	2	4
AIRPORT SUPERVISORY PERSONNEL									
IMPROPER MAINTENANCE-AIRPORT FACILITIES				1		1	1		1
FAILURE TO NOTIFY OF UNSAFE COND/AND OR FAILURE TO MARK				3	3	6	3	3	6
IMPROPER/INADEQUATE SNOW REMOVAL				7	5	12	7	5	12
IMPROPER INSPECTION OF FACILITIES				1		1	1		1
OTHER		1	1	1		1	1	1	2
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
SUBSTANDARD QUALITY CONTROL				1		1	1		1
POOR/INADEQUATE DESIGN	2	1	3	10	1	11	12	2	14
OTHER	1		1	3		3	4		4
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT	30		30	52	3	55	82	3	85
GROUND SIGNALMAN				3		3	3		3
SPECTATOR				2		2	2		2
GROUND CREWMAN	1		1	1	2	3	2	2	4
PASSENGER	5		5	15	3	18	20	3	23
DRIVER OF VEHICLE		1	1	10	1	11	10	2	12
OTHER	1	2	3	2	2	4	3	4	7
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
FLIGHT ATTENDANT				1		1	1		1
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL	60	20	80	334	67	401	394	87	481
** AIRFRAME **									
WINGS									
SPARS		5	5					5	5
WING ATTACHMENT FITTINGS, BOLTS		2	2	1		1	1	2	3
BRACING WIRES, STRUTS				1		1	1		1
SKIN AND ATTACHMENTS	1	2	3				1	2	3
WINGTIPS				1		1	1		1
OTHER		2	2					2	2
FUSELAGE									
SKIN AND ATTACHMENTS				1	1	2	1	1	2
DOORS, DOOR FRAMES	1		1	2	2	4	3	2	5
WINDSHIELDS, WINDOWS, CANOPIES					1	1		1	1
SEATS				1		1	1		1
OTHER		2	2		1	1		3	3
LANDING GEAR									
MAIN GEAR-SHOCK ABSORBING ASSY, STRUTS, ATTACHMENTS, ETC				31		31	31		31
NORMAL RETRACTION/EXTENSION ASSEMBLY				24	4	28	24	4	28
EMERGENCY/EXTENSION ASSEMBLY				7		7	7		7
TAILWHEEL ASSEMBLIES	1		1	4	2	6	5	2	7
NOSEWHEEL ASSEMBLIES				13		13	13		13
WHEELS, TIRES, AXLES				15	8	23	15	8	23
SKI ASSEMBLIES				1		1	1		1

## CAUSE/FACTOR TABLE

## AIRFRAME (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
FLOAT ASSEMBLIES				1		1	1		1
SKID ASSEMBLY				1		1	1		1
BRAKING SYSTEM (NORMAL)				41	5	46	41	5	46
LANDING GEAR WARNING AND INDICATING COMPONENTS					7	7		7	7
GEAR LOCKING MECHANISM				16		16	16		16
SWITCHES, LEVERS, CRANKING MECHANISM, ETC				3		3	3		3
NOSEWHEEL STEERING				4		4	4		4
OTHER				3	2	5	3	2	5
FLIGHT CONTROL SURFACES									
ELEVATOR, ASSEMBLY ATTACHMENTS	2	2	4	1		1	3	2	5
RUDDER, SURFACES ATTACHMENTS		1	1	2		2	2	1	3
AILERON, SURFACES ATTACHMENTS	1		1	2		2	3		3
HORIZONTAL STABILIZER, ATTACHMENTS		2	2					2	2
VERTICAL STABILIZER, ATTACHMENTS	1		1				1		1
FLAP ASSEMBLIES				1		1	1		1
OTHER		2	2	1		1	1	2	3
SUBTOTAL	7	20	27	178	33	211	185	53	238
** POWERPLANT **									
ENGINE STRUCTURE									
CRANKCASE				1		1	1		1
CRANKSHAFT	3		3	16		16	19		19
MASTER AND CONNECTING RODS	2		2	32		32	34		34
CYLINDER ASSEMBLY				21	1	22	21	1	22
PISTON, PISTON RINGS	2	1	3	13		13	15	1	16
VALVE ASSEMBLIES	2	1	3	31		31	33	1	34
BLOWER, IMPELLER ASSEMBLY				9		9	9		9
OTHER				8		8	8		8
IGNITION SYSTEM									
MAGNETOES	3		3	21	1	22	24	1	25
SPARK PLUG	2	1	3	13	2	15	15	3	18
COILS				1		1	1		1
LOW TENSION WIRING				1		1	1		1
IGNITION HARNESS, SHIELDING				3		3	3		3
SWITCHES				2	1	3	2	1	3
LEADS				2		2	2		2
FUEL SYSTEM									
TANKS				6	1	7	6	1	7
LINE AND FITTINGS	2		2	18		18	20		20
SELECTOR VALVES		1	1	3	1	4	3	2	5
FILTERS, STRAINERS, SCREENS	2		2	2	1	3	4	1	5
PRIMING SYSTEM				1		1	1		1
CARBURETOR				14		14	14		14
PUMPS	1		1	8	1	9	9	1	10
FUEL INJECTION SYSTEM	1		1	7		7	8		8
VENTS, DRAINS, TANK CAPS				13	3	16	13	3	16
RAM AIR ASSEMBLY				5		5	5		5
OTHER	1		1	8	2	10	9	2	11
LUBRICATING SYSTEM									
LINE, HOSES, FITTINGS	2	2	4	14		14	16	2	18
VALVES				2		2	2		2
FILTERS, SCREENS	1		1				1		1
PUMP-PRESSURE				2		2	2		2
PUMPS-SCAVENGER				1		1	1		1
SEALS AND GASKETS				3		3	3		3
OTHER				3		3	3		3
COOLING SYSTEM									
COWLING				1		1	1		1
OTHER				1		1	1		1
PROPELLER AND ACCESSORIES									
BLADES	1		1	12	1	13	13	1	14
HUBS				4		4	4		4
HYDRAULIC PITCH CONTROL MECHANISM				3		3	3		3
COUNTERWEIGHT				1		1	1		1
GOVERNORS				3		3	3		3
BLADE RETENTION MECHANISM				1		1	1		1
PLANETARY GEAR				1		1	1		1
OTHER	1	2	3	3		3	4	2	6
EXHAUST SYSTEM									
MANIFOLDS	1		1	1		1	2		2
MUFFLERS	1		1	2		2	3		3
STACKS	1		1	2		2	3		3
BAFFLES				1		1	1		1
EXTERNAL SUPERCHARGER				1		1	1		1

CAUSE/FACTOR TABLE

POWERPLANT (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
OTHER				1		1	1		1
ENGINE ACCESSORIES									
VACUUM PUMPS	1		1	1		1	2		2
GENERATORS				1	2	3	1	2	3
STARTERS				1		1	1		1
ENGINE CONTROLS									
THROTTLE-POWER LEVER ASSEMBLIES				17		17	17		17
MIXTURE CONTROL ASSEMBLIES				5	1	6	5	1	6
FUEL INJECTION CONTROL				1		1	1		1
INDUCTION AIR, PREHEAT CONTROLS				2		2	2		2
PROPELLER GOVERNOR CONTROLS					1	1		1	1
POWERPLANT-INSTRUMENTS									
FUEL QUANTITY GAUGE		2	2		13	13		15	15
MISCELLANEOUS									
POWERPLANT FAILURE FOR UNDETERMINED REASONS	16	1	17	177		177	193	1	194
BIRD INGESTION	1		1	2		2	3		3
FOREIGN OBJECT DAMAGE				1		1	1		1
COMPRESSOR STALLS				1		1	1		1
REDUCTION GEAR ASSEMBLY									
GEARS, REDUCTION				1		1	1		1
GEARS, ACCESSORY DRIVE				4		4	4		4
COMPRESSOR ASSEMBLY									
CASTING				1		1	1		1
BEARING, ROTOR SHAFT				1		1	1		1
COMBUSTION ASSEMBLY									
SEALS, EXPANSION				1		1	1		1
TURBINE ASSEMBLY									
ACCESSORY DRIVE ASSEMBLY									
GEARS, ACCESSORY DRIVE				1		1	1		1
LUBRICATING SYSTEM									
TUBING	1		1				1		1
OTHER				1		1	1		1
FUEL SYSTEM									
PUMP, FUEL					1	1		1	1
FUEL CONTROL					1	1		1	1
OTHER				1		1	1		1
SAFETY SYSTEM									
IGNITION SYSTEM									
TORQUEMETER									
AIR BLEED									
EXHAUST SYSTEM									
THRUST REVERSER									
PROPELLER SYSTEM									
PITCH CHANGING MECHANISM				1		1	1		1
CONSTANT SPEED DRIVE									
POWER LEVER									
PROPELLER LEVER									
REVERSE THRUST LEVER									
ENGINE INDICATING EQUIPMENT									
ENGINE INSTALLATION									
SUBTOTAL	48	11	59	543	34	577	591	45	636
** SYSTEMS **									
ELECTRICAL SYSTEM									
BATTERIES				2		2	2		2
GENERATORS/ALTERNATORS		1	1		6	6		7	7
REGULATOR		1	1					1	1
RELAYS AND WIRING				1	2	3	1	2	3
MOTORS				1		1	1		1
SWITCHES					1	1		1	1
PROTECTIVE DEVICES					1	1		1	1
OTHER				3	2	5	3	2	5
HYDRAULIC SYSTEM									
HYDRAULIC PUMPS					1	1		1	1
RESERVOIR, LINES, FITTINGS				4	2	6	4	2	6
SEALS				4		4	4		4
BY-PASS VALVE				1		1	1		1
OTHER				3	1	4	3	1	4
FLIGHT CONTROL SYSTEMS									
AILERON AND AILERON TAB CONTROL SYSTEM				8	1	9	8	1	9
ELEVATOR AND ELEVATOR TAB CONTROL SYSTEM	3		3	5		5	8		8
RUDDER AND RUDDER TAB CONTROL SYSTEM				5	2	7	5	2	7
WING FLAP CONTROL SYSTEM (ELECTRICAL)				1	2	3	1	2	3
WING FLAP CONTROL SYSTEM (MECHANICAL)				1		1	1		1

## CAUSE/FACTOR TABLE

## SYSTEMS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
OTHER	1		1				1		1
ANTI-ICING, DE-ICING SYSTEMS									
CARBURETOR DE-ICING SYSTEM				3		3	3		3
AIR CONDITION, HEATING AND PRESSURIZATION									
OTHER	1		1				1		1
AUTO PILOT									
FIRE WARNING SYSTEM									
FIRE EXTINGUISHER SYSTEM									
OXYGEN SYSTEM									
OTHER SYSTEMS									
SUBTOTAL	5	2	7	42	21	63	47	23	70
** INSTRUMENTS/EQUIPMENT AND ACCESSORIES **									
FLIGHT AND NAVIGATION INSTRUMENTS									
AIRSPEED					4	4		4	4
ATTITUDE GYRO		1	1					1	1
OTHER					1	1		1	1
COMMUNICATIONS AND NAVIGATION EQUIPMENT									
TRANSMITTERS AND/OR RECEIVERS	1		1		1	1	1	1	2
ILS RECEIVERS					1	1		1	1
VOR RECEIVERS					2	2		2	2
OTHER					1	1		1	1
MISCELLANEOUS EQUIPMENT									
SPRAY, DUSTING EQUIPMENT				3	6	9	3	6	9
PICK-UP EQUIPMENT					1	1		1	1
SUBTOTAL	1	1	2	3	17	20	4	18	22
** ROTORCRAFT **									
ROTOR ASSEMBLIES									
MAIN ROTOR BLADES				3		3	3		3
TAIL ROTOR BLADES				3		3	3		3
MAIN ROTOR HEAD ASSEMBLIES				1		1	1		1
BEARINGS				2		2	2		2
OTHER				1		1	1		1
TRANSMISSION ROTOR DRIVE SYSTEM									
ENGINE DRIVE SHAFT				2		2	2		2
FREE WHEEL UNIT				1		1	1		1
MAIN ROTOR GEAR BOX	1		1				1		1
TAIL ROTOR DRIVE SHAFT ASSEMBLY				2		2	2		2
TAIL ROTOR GEAR BOX				3	1	4	3	1	4
CLUTCH ASSEMBLY				4		4	4		4
OTHER	1		1	3		3	4		4
FLIGHT CONTROL SYSTEMS									
CYCLIC PITCH CONTROL SYSTEM	1		1	1		1	2		2
COLLECTIVE PITCH CONTROL SYSTEM				1		1	1		1
TAIL ROTOR PITCH CONTROL SYSTEM				2		2	2		2
STABILIZING SURFACES-DAMPERS				1		1	1		1
MISCELLANEOUS UNITS AND ASSEMBLIES									
TAIL BOOMS/PYLONS/CONES	1		1	2		2	3		3
OTHER				1		1	1		1
SUBTOTAL	4		4	33	1	34	37	1	38
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
INSTRUMENT LANDING SYSTEM		1	1					1	1
APPROACH LIGHTING		1	1		1	1		2	2
RUNWAY LIGHTING		1	1	3	15	18	3	16	19
TAXIWAY LIGHTING AND MARKING					2	2		2	2
OTHER		1	1	1	6	7	1	7	8
AIRPORT CONDITIONS									
WET RUNWAY		1	1	6	48	54	6	49	55
ICE/SLUSH ON RUNWAY				2	17	19	2	17	19
SNOW ON RUNWAY		1	1	6	47	53	6	48	54
SNOW WINDROWS		1	1	2	33	35	2	34	36
UNMARKED OBSTRUCTIONS				1	3	4	1	3	4
SOFT SHOULDERS (RUNWAY)					15	15		15	15
ROUGH WATER					1	1		1	1
HIGH VEGETATION		3	3	1	12	13	1	15	16
HIDDEN HAZARD				4	5	9	4	5	9
POORLY MAINTAINED RUNWAY SURFACE				7	18	25	7	18	25

## CAUSE/FACTOR TABLE

## AIRPORTS/AIRWAYS/FACILITIES (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
SOFT RUNWAY				5	22	27	5	22	27
ICE/SLUSH ON RAMP/TAXIWAY					3	3		3	3
SNOW ON RAMP/TAXIWAY					2	2		2	2
SOFT SHOULDERS (RAMP/TAXIWAY)				1	2	3	1	2	3
POORLY MAINTAINED RAMP/TAXIWAY SURFACE				1	1	2	1	1	2
SOFT TAXIWAY				1		1	1		1
OTHER				8	59	67	8	59	67
AIRWAYS FACILITIES									
SUBTOTAL		10	10	49	312	361	49	322	371
** WEATHER **									
LOW CEILING	2	135	137		59	59	2	194	196
RAIN		48	48		42	42		90	90
FOG	2	95	97		64	64	2	159	161
SNOW		23	23		14	14		37	37
HAIL		1	1	1	1	2	1	2	3
ICING CONDITIONS—INCLUDES SLEET, FREEZING RAIN, ETC	1	14	15		16	16	1	30	31
CONDITIONS CONDUCTIVE TO CARB/INDUCTION SYSTEM ICING		7	7		53	53		60	60
UNFAVORABLE WIND CONDITIONS		12	12	31	270	301	31	282	313
WIND SHEAR		3	3	5	4	9	5	7	12
SUDDEN WINDSHIFT				15	20	35	15	20	35
TURBULENCE IN FLIGHT, CLEAR AIR	1	4	5		6	6	1	10	11
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS	1	13	14	2	13	15	3	26	29
DOWNDRAFTS, UPDRAFTS	1	13	14	13	53	66	14	66	80
LOCAL WHIRLWIND				9	2	11	9	2	11
TORNADO		1	1					1	1
SQUALL LINE		1	1					1	1
ADVERSE WINDS ALOFT				1	2	3	1	2	3
HIGH TEMPERATURE		4	4		23	23		27	27
OBSTRUCTIONS TO VISION		11	11		5	5		16	16
HIGH DENSITY ALTITUDE		20	20		77	77		97	97
THUNDERSTORM ACTIVITY		24	24	2	20	22	2	44	46
OTHER		4	4		3	3		7	7
SUBTOTAL	8	433	441	79	747	826	87	1180	1267
** TERRAIN **									
WET, SOFT GROUND				45	63	108	45	63	108
SNOW-COVERED		1	1	14	24	38	14	25	39
ICY					2	2		2	2
HIGH VEGETATION		1	1	34	46	80	34	47	81
HIDDEN OBSTRUCTIONS				15	10	25	15	10	25
ROUGH/UNEVEN	2	3	5	110	137	247	112	140	252
ROUGH WATER				1	5	6	1	5	6
GLASSY WATER					3	3		3	3
HIGH OBSTRUCTIONS	7	75	82	82	264	346	89	339	428
LOOSE GRAVEL		1	1		6	6		7	7
SANDY		1	1	2	5	7	2	6	8
OTHER		4	4	14	34	48	14	38	52
SUBTOTAL	9	86	95	317	599	916	326	685	1011
** MISCELLANEOUS **									
SUICIDE	1		1				1		1
FOREIGN OBJECT DAMAGE				10		10	10		10
SMOKE IN COCKPIT	1	1	2	1	5	6	2	5	7
FOREIGN MATERIAL AFFECTING NORMAL OPERATIONS	4	4	8	22	2	24	26	2	28
UNDETERMINED	52		52	30		30	82		82
BIRD COLLISION				3		3	3		3
VORTEX TURBULENCE	1		1	7	2	9	8	2	10
PROP/JET/ROTOR BLAST				5		5	5		5
ANIMAL(S) ON RUNWAY/TAXIWAY/RAMP				12		12	12		12
EVASIVE MANEUVER TO AVOID COLLISION	6	3	9	53	11	64	59	14	73
UNQUALIFIED PERSON OPERATED AIRCRAFT	4		4	12	4	16	16	4	20
DIRECT ENTRIES	1		1	5		5	6		6
SUBTOTAL	70	3	73	160	24	184	230	27	257
GRAND TOTAL	1260	727	1987	6135	2221	8356	7395	2948	10343
** MISCELLANEOUS ACTS, CONDITIONS **									

## CAUSE/FACTOR TABLE

## MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
FIRE OF UNDETERMINED ORIGIN		2	2		4	4		6	6
UNAPPROVED MODIFICATION		2	2		3	4		5	5
IMPROPER/INADEQUATE VENTING				5		5	5		5
ACTION, LACK OF				1		1	1		1
POOR WELD				2		2	2		2
PREVIOUS DAMAGE				16	8	24	16	8	24
BRAKES FROZEN				1	1	2	1	1	2
LEAK/LEAKAGE	4	2	6	18	5	23	22	7	29
LOW FLUID LEVEL				2		2	2		2
CIRCUIT BREAKER POPPED				1	4	5	1	4	5
ARCING				1		1	1		1
LOW COMPRESSION		2	2	14	1	15	14	3	17
RUNWAY CLOSED				2	6	8	2	6	8
DOWNWIND		6	6	2	101	103	2	107	109
CARBON DEPOSITS				6	2	8	6	2	8
LANDED IN CONSTRUCTION AREA				4	2	6	4	2	6
OVER TORQUED				1	1	2	1	1	2
UNDER TORQUED				1		1	1		1
LOOSE, PART/FITTING	1		1	15	4	19	16	4	20
GROUND RESONANCE	1		1				1		1
BENT	1		1				1		1
BINDING				3	1	4	3	1	4
BURST				2		2	2		2
BURNED				1		1	1		1
CHAFFED				4		4	4		4
CHIPPED	1		1				1		1
COLLAPSED				1	1	2	1	1	2
CROSSED				2	2	4	2	2	4
DETERIORATED				3	3	6	3	3	6
DISCONNECTED	3		3	23	1	24	26	1	27
DISTORTED				1		1	1		1
ELONGATED				1		1	1		1
EXCESSIVE-WEAR/PLAY				9	2	11	9	2	11
ERRATIC		1	1	1	13	14	1	14	15
FLUCTUATING					2	2		2	2
FLUTTER	3		3	1	1	2	4	1	5
FRAYED				2		2	2		2
FRICTION, EXCESSIVE				1		1	1		1
GROUNDING	1		1	8		8	9		9
IMPROPERLY INSTALLED	1		1	23	1	24	24	1	25
JAMMED	2		2	7	3	10	9	3	12
NICKED				1		1	1		1
OBSTRUCTED	5		5	25	1	26	30	1	31
OPEN				1	1	2	1	1	2
OUT OF BALANCE				1		1	1		1
OVERHEATED				5		5	5		5
EXCESSIVE PRESSURE	1		1				1		1
PRESSURE TOO LOW				4	4	8	4	4	8
PRESSURE, NONE				8	1	9	8	1	9
SCORED	1		1	3		3	4		4
SHEARED				2		2	2		2
STICKING				1		1	1		1
STRIPPED				1		1	1		1
STUCK		1	1	4	2	6	4	3	7
EXCESSIVE TEMPERATURE	1		1				1		1
VIBRATION, EXCESSIVE				4	2	6	4	2	6
ICE-INDUCTION				1		1	1		1
SEAT BELT SIGN ON					1	1		1	1
FIRE IN WING	1	2	3		3	3	1	5	6
LOAD NOT JETTISONED		2	2	6		12	6	8	14
INTENTIONAL GROUND-WATER LOOP-SWERVE				18	8	26	18	8	26
INTENTIONAL WHEELS UP				15	9	24	15	9	24
RAN OFF END OF RUNWAY					116	116		116	116
ALTITUDE SETTING-INCORRECT	1		1	1	2	3	2	2	4
ANTI-ICING/DEICING EQUIP-IMPROPER OPER. OF/FAILED TO USE	5		5	47		47	52		52
CHECKLIST-FAILED TO USE		1	1		19	19		20	20
CREW COORDINATION-POOR				1	1	2		1	2
DISREGARD OF GOOD OPERATING PRACTICE	2	5	7	5	8	13	7	13	20
IMPROPER EMERGENCY PROCEDURES	4	4	8	15	7	22	19	11	30
FEATHERED WRONG ENGINE	1		1				1		1
GUST LOCKS ENGAGED				1		1	1		1
INSTRUCTIONS-MISINTERPRETED				1	1	2	1	1	2
INSTRUMENTS-MISREAD OR FAILED TO READ	2	2	4	5	2	7	7	4	11
SEAT BELT NOT FASTENED		4	4	1		1	1	4	5
NOT ALLIGNED WITH RUNWAY/INTENDED LANDING AREA	2	1	3	19	11	30	21	12	33
UNWARRANTED LOW FLYING	37	34	71	35	30	65	72	64	136



CAUSE/FACTOR TABLE

MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)(CONTINU

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
FAILED TO EXTEND THE LANDING FLAPS					1	1		1	1
FAILED TO USE ALL AVAILABLE RUNWAY				2	6	8	2	7	9
LANDED AT WRONG AIRPORT		1	1	1	1	2	1	1	2
INATTENTIVE TO FUEL SUPPLY	5		5	40	4	44	45	4	49
FLEW INTO BLIND CANYON	10	3	13	10	1	11	20	4	24
PREMATURE FLAP RETRACTION				2	3	5	2	3	5
POORLY PLANNED APPROACH	2	5	7	17	45	62	19	50	69
MISCALCULATED FUEL CONSUMPTION	1	1	2	16	6	22	17	7	24
JETTISONED LOAD					28	28		28	28
STOLEN OR UNAUTHORIZED USE OF AIRCRAFT		6	6		19	19		25	25
IMPROPERLY SECURED	3		3	13	4	17	16	4	20
BOGUS PART				2	1	3	2	1	3
COMMUNICATIONS FAILURE		1	1					1	1
ELECTRICAL FAILURE		1	1	2	12	14	2	13	15
ENGINE LOADED UP				7	2	9	7	2	9
FATIGUE FRACTURE	9	1	10	27		27	36	1	37
FUEL GRADE-IMPROPER		1	1	5		5	5	1	6
HYDRAULIC FAILURE				7	2	9	7	2	9
RPM-UNCONTROLLABLE-OVERSPEED				2	2	4	2	2	4
THRUST REVERSAL-ASYMETRICAL					1	1		1	1
WINDSHIELD, DIRTY, FOGGY, ETC-RESTRICTED VISION		1	1	2	5	7	2	6	8
WRONG PART	1	1	2	8		8	9	1	10
IMPROPER ALIGNMENT/ADJUSTMENT	1		1	18	3	21	19	3	22
FAILURE OF TWO OR MORE ENGINES	1	4	5	3	12	15	4	16	20
SEPARATION IN FLIGHT		39	39	2	22	24	2	61	63
FIRE IN CABIN/ COCKPIT/ BAGGAGE COMPARTMENT	1		1	1	2	3	2	2	4
FIRE IN ENGINE	2		2	8	10	18	10	10	20
FIRE IN BRAKES/ WHEEL ASSEMBLY/ WHEEL WELL	1	2	3				1	2	3
ASYMETRICAL FLAPS				1		1	1		1
LATERAL IMBALANCE				2		2	2		2
CORRODED/CORROSION				6	1	7	6	1	7
INCORRECT TRIM SETTING					3	3		3	3
CARGO SHIFTED	1		1	2		2	3		3
CONGESTED TRAFFIC-PATTERN		2	2		6	6		8	8
PILOT FATIGUE	2	13	15	3	17	20	5	30	35
FUEL EXHAUSTION	19		19	213		213	232		232
FUEL CONTAMINATION-EXCLUSIVE OF WATER IN FUEL	1		1	20	2	22	21	2	23
PILOT SUFFERED HEART ATTACK	2		2				2		2
ALCOHOLIC IMPAIRMENT OF EFFICIENCY AND JUDGMENT	25	16	41	2	4	6	27	20	47
CARBON MONOXIDE POISONING	1		1				1		1
ICE-IN FUEL	2		2	7		7	9		9
ICE-CARBURETOR	5		5	50		50	55		55
ICE-PROPELLER				1		1	1		1
AIRFRAME ICE	5	3	8	20	8	28	25	11	36
ICE-WINDSHIELD		2	2	3	4	7	3	4	9
IMPROPERLY LOADED AIRCRAFT-WEIGHT-AND/OR CG	5	13	18	14	14	28	19	27	46
INTERFERENCE WITH FLIGHT CONTROLS	3		3	12	2	14	15	2	17
WHITEDOUT		1	1	2	5	7	2	6	8
SUNGLARE		3	3	1	12	13	1	15	16
LACK OF LUBRICATION-SPECIFIC PART, NOT SYSTEM	1		1	2	2	4	3	2	5
OIL EXHAUSTION-ENGINE LUBRICATION SYSTEM	1	1	2	26		26	27	1	28
SIMULATED CONDITIONS		4	4	3	31	34	3	35	38
FUEL SIPHONING				2		2	2		2
WATER IN FUEL	7	1	8	50		50	57	1	58
AIRCRAFT CAME TO REST IN WATER		36	36	1	81	82	1	117	118
FROZEN, MOISTURE				5	1	6	5	1	6
MISSING		1	1	15		15	15	1	16
TOUCH AND GO LANDING		3	3		74	74		77	77
HYDROPLANING ON WET RUNWAY				4	9	13	4	9	13
OVERLOAD FAILURE	4	27	31	10	376	386	14	403	417
MATERIAL FAILURE	13	1	14	219	10	229	232	11	243
FUEL STARVATION	22		22	143		143	165		165
OIL STARVATION				9		9	9		9
IMPROPER CLEARANCE-TOLFRANCE	1		1	8	1	9	9	1	10
FUEL SELECTOR POSITIONED BETWEEN TANKS	1		1	1	1	2	2	1	3

# CAUSE/FACTOR TABLE

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL

## DIRECT ENTRY CAUSES

MISC - FUEL STARVATION FOR UNDETERMINED REASON  
MISC - FLT SUIT SLEEVE CAUGHT & CLOSED THROTTLE  
MISC-PREMATURE CHUTE OPENING  
PILOT-FAILED TO MAINTAIN POSITIVE RATE-OF-CLIMB  
MISC-PREMATURE CHUTE OPENING  
INADOT TRNG ACFT MFCR-INADOT SUPVSD TRNG-OPRTR  
INADOT TRNG ACFT MFCR-INADOT SUPVSD TRNG-OPRTR

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

CAUSE/FACTOR TABLE  
INSTRUCTIONAL  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 569 TOTAL ACCIDENTS  
INVOLVES 47 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	39 82.98	12 25.53	41 87.23	459 87.93	60 11.49	460 88.12	498 87.52	72 12.65	501 88.05
PERSONNEL	5 10.64	4 8.51	9 19.15	44 8.43	15 2.87	56 10.73	49 8.61	19 3.34	65 11.42
AIRFRAME	.00	.00	.00	2 .38	.00	2 .38	2 .35	.00	2 .35
LANDING GEAR	.00	.00	.00	12 2.30	3 .57	14 2.68	12 2.11	3 .53	14 2.46
POWERPLANT	4 8.51	.00	4 8.51	53 10.15	3 .57	54 10.34	57 10.02	3 .53	58 10.19
SYSTEMS	1 2.13	.00	1 2.13	2 .38	3 .57	5 .96	3 .53	3 .53	6 1.05
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	.00	1 .19	1 .19	.00	1 .18	1 .18
ROTORCRAFT	.00	.00	.00	2 .38	.00	2 .38	2 .35	.00	2 .35
AIRPORT/AIRWAYS/FACILITIES	.00	1 2.13	1 2.13	6 1.15	44 8.43	49 9.39	6 1.05	45 7.91	50 8.79
WEATHER	.00	8 17.02	8 17.02	9 1.72	79 15.13	87 16.67	9 1.58	87 15.29	95 16.70
TERRAIN	.00	4 8.51	4 8.51	28 5.36	67 12.84	95 18.20	28 4.92	71 12.48	99 17.40
MISCELLANEOUS	.00	.00	.00	18 3.45	4 .77	22 4.21	18 3.16	4 .70	22 3.87
UNDETERMINED	5 10.64	.00	5 10.64	2 .38	.00	2 .38	7 1.23	.00	7 1.23

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

## PLEASURE ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 2100 TOTAL ACCIDENTS

INVOLVES 406 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	361 88.92	75 18.47	364 89.66	1374 81.11	159 9.39	1390 82.05	1735 82.62	234 11.14	1754 83.52
PERSONNEL	22 5.42	8 1.97	27 6.65	122 7.20	24 1.42	145 8.56	144 6.86	32 1.52	172 8.19
AIRFRAME	2 .49	10 2.46	12 2.96	7 .41	2 .12	9 .53	9 .43	12 .57	21 1.00
LANDING GEAR	.00	.00	.00	69 4.07	16 .94	84 4.96	69 3.29	16 .76	84 4.00
POWERPLANT	25 6.16	8 1.97	32 7.88	226 13.34	13 .77	239 14.11	251 11.95	21 1.00	271 12.90
SYSTEMS	1 .25	.00	1 .25	23 1.36	11 .65	34 2.01	24 1.14	11 .52	35 1.67
INSTRUMENTS/EQUIPMENT & ACCESSORIES	1 .25	1 .25	2 .49	.00	6 .35	6 .35	1 .05	7 .33	8 .38
ROTORCRAFT	.00	.00	.00	3 .18	.00	3 .18	3 .14	.00	3 .14
AIRPORT/AIRWAYS/FACILITIES	.00	4 .99	4 .99	16 .94	152 8.97	166 9.80	16 .76	156 7.43	170 8.10
WEATHER	5 1.23	155 38.18	159 39.16	37 2.18	335 19.78	367 21.66	42 2.00	490 23.33	526 25.05
TERRAIN	5 1.23	60 14.78	65 16.01	133 7.85	269 15.88	402 23.73	138 6.57	329 15.67	467 22.24
MISCELLANEOUS	10 2.46	2 .49	12 2.96	57 3.36	9 .53	65 3.84	67 3.19	11 .52	77 3.67
UNDETERMINED	29 7.14	.00	29 7.14	9 .53	.00	9 .53	38 1.81	.00	38 1.81

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

BUSINESS  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 294 TOTAL ACCIDENTS

INVOLVES 51 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	46 90.20	11 21.57	47 92.16	204 83.95	19 7.82	205 84.36	250 85.03	30 10.20	252 85.71
PERSONNEL	5 9.80	.00	5 9.80	21 8.64	4 1.65	25 10.29	26 8.84	4 1.36	30 10.20
AIRFRAME	.00	1 1.96	1 1.96	.00	1 .41	1 .41	.00	2 .68	2 .68
LANDING GEAR	.00	.00	.00	15 6.17	2 .82	17 7.00	15 5.10	2 .68	17 5.78
POWERPLANT	4 7.84	.00	4 7.84	27 11.11	2 .82	29 11.93	31 10.54	2 .68	33 11.22
SYSTEMS	.00	2 3.92	2 3.92	.00	3 1.23	3 1.23	.00	5 1.70	5 1.70
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	.00	1 .41	1 .41	.00	1 .34	1 .34
ROTORCRAFT	.00	.00	.00	3 1.23	.00	3 1.23	3 1.02	.00	3 1.02
AIRPORT/AIRWAYS/FACILITIES	.00	1 1.96	1 1.96	3 1.23	28 11.52	30 12.35	3 1.02	29 9.86	31 10.54
WEATHER	.00	29 56.86	29 56.86	7 2.88	53 21.81	59 24.28	7 2.38	82 27.89	88 29.93
TERRAIN	.00	6 11.76	6 11.76	13 5.35	43 17.70	55 22.63	13 4.42	49 16.67	61 20.75
MISCELLANEOUS	1 1.96	.00	1 1.96	4 1.65	1 .41	4 1.65	5 1.70	1 .34	5 1.70
UNDETERMINED	2 3.92	.00	2 3.92	1 .41	.00	1 .41	3 1.02	.00	3 1.02

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  
CORPORATE/EXECUTIVE  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 59 TOTAL ACCIDENTS  
INVOLVES 15 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	12 80.00	2 13.33	12 80.00	31 70.45	3 6.82	32 72.73	43 72.88	5 8.47	44 74.58
PERSONNEL	.00	2 13.33	2 13.33	4 9.09	.00	4 9.09	4 6.78	2 3.39	6 10.17
AIRFRAME	.00	.00	.00	.00	.00	.00	.00	.00	.00
LANDING GEAR	.00	.00	.00	3 6.82	1 2.27	4 9.09	3 5.08	1 1.69	4 6.78
POWERPLANT	3 20.00	1 6.67	3 20.00	3 6.82	1 2.27	4 9.09	6 10.17	2 3.39	7 11.86
SYSTEMS	.00	.00	.00	1 2.27	1 2.27	2 4.55	1 1.69	1 1.69	2 3.39
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	.00	1 2.27	1 2.27	.00	1 1.69	1 1.69
ROTORCRAFT	.00	.00	.00	1 2.27	.00	1 2.27	1 1.69	.00	1 1.69
AIRPORT/AIRWAYS/FACILITIES	.00	.00	.00	1 2.27	7 15.91	8 18.18	1 1.69	7 11.86	8 13.56
WEATHER	.00	10 66.67	10 66.67	1 2.27	9 20.45	10 22.73	1 1.69	19 32.20	20 33.90
TERRAIN	.00	2 13.33	2 13.33	1 2.27	5 11.36	6 13.64	1 1.69	7 11.86	8 13.56
MISCELLANEOUS	.00	.00	.00	1 2.27	.00	1 2.27	1 1.69	.00	1 1.69
UNDETERMINED	3 20.00	.00	3 20.00	2 4.55	.00	2 4.55	5 8.47	.00	5 8.47

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

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CAUSE/FACTOR TABLE

AERIAL APPLICATION AND FIRE CONTROL (INCLUDES ASSOCIATED ACTIVITIES)  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 452 TOTAL ACCIDENTS

INVOLVES 29 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	29 100.00	4 13.79	29 100.00	280 66.19	21 4.96	282 66.67	309 68.36	25 5.53	311 68.81
PERSONNEL	2 6.90	.00	2 6.90	43 10.17	10 2.36	51 12.06	45 9.96	10 2.21	53 11.73
AIRFRAME	.00	.00	.00	2 .47	1 .24	3 .71	2 .44	1 .22	3 .66
LANDING GEAR	.00	.00	.00	19 4.49	2 .47	21 4.96	19 4.20	2 .44	21 4.65
POWERPLANT	.00	.00	.00	111 26.24	6 1.42	115 27.19	111 24.56	6 1.33	115 25.44
SYSTEMS	.00	.00	.00	2 .47	.00	2 .47	2 .44	.00	2 .44
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	3 .71	6 1.42	9 2.13	3 .66	6 1.33	9 1.99
ROTORCRAFT	.00	.00	.00	9 2.13	.00	9 2.13	9 1.99	.00	9 1.99
AIRPORT/AIRWAYS/FACILITIES	.00	.00	.00	5 1.18	10 2.36	14 3.31	5 1.11	10 2.21	14 3.10
WEATHER	.00	2 6.90	2 6.90	3 .71	42 9.93	45 10.64	3 .66	44 9.73	47 10.40
TERRAIN	.00	1 3.45	1 3.45	79 18.68	85 20.09	164 38.77	79 17.48	86 19.03	165 36.50
MISCELLANEOUS	2 6.90	.00	2 6.90	19 4.49	4 .95	23 5.44	21 4.65	4 .88	25 5.53
UNDETERMINED	.00	.00	.00	3 .71	.00	3 .71	3 .66	.00	3 .66

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  
AIR TAXI  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 206 TOTAL ACCIDENTS  
INVOLVES 38 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	32 84.21	2 5.26	32 84.21	115 68.45	11 6.55	116 69.05	147 71.36	13 6.31	148 71.84
PERSONNEL	4 10.53	4 10.53	8 21.05	28 16.67	6 3.57	33 19.64	32 15.53	10 4.85	41 19.90
AIRFRAME	.00	.00	.00	1 .60	.00	1 .60	1 .49	.00	1 .49
LANDING GEAR	.00	.00	.00	17 10.12	1 .60	18 10.71	17 8.25	1 .49	18 8.74
POWERPLANT	3 7.89	.00	3 7.89	29 17.26	2 1.19	30 17.86	32 15.53	2 .97	33 16.02
SYSTEMS	1 2.63	.00	1 2.63	2 1.19	.00	2 1.19	3 1.46	.00	3 1.46
INSTRUMENTS/EQUIPMENT & ACCESSORIES	.00	.00	.00	.00	1 .60	1 .60	.00	1 .49	1 .49
ROTORCRAFT	.00	.00	.00	1 .60	.00	1 .60	1 .49	.00	1 .49
AIRPORT/AIRWAYS/FACILITIES	.00	.00	.00	5 2.98	17 10.12	22 13.10	5 2.43	17 8.25	22 10.68
WEATHER	.00	14 36.84	14 36.84	6 3.57	38 22.62	43 25.60	6 2.91	52 25.24	57 27.67
TERRAIN	2 5.26	8 21.05	10 26.32	10 5.95	27 16.07	37 22.02	12 5.83	35 16.99	47 22.82
MISCELLANEOUS	1 2.63	1 2.63	2 5.26	8 4.76	1 .60	9 5.36	9 4.37	2 .97	11 5.34
UNDETERMINED	4 10.53	.00	4 10.53	.00	.00	.00	4 1.94	.00	4 1.94

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



## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
ALL OPERATIONSFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

INSTRUCTIONAL

DUAL	25	29	34	141	229	227	5.28
SOLO	12	6	36	149	203	203	4.68
CHECK	3		1	8	12	12	.28
TRAINING	9	11	12	99	131	131	3.02

NONCOMMERCIAL

PLEASURE	426	206	330	1181	2143	2129	49.42
PRACTICE	21	14	19	112	166	166	3.83
BUSINESS	53	24	32	190	299	299	6.90
CORPORATE/EXECUTIVE	18	6	7	33	64	64	1.48
AERIAL SURVEY	5	3	2	6	16	16	.37
COMPANY FLIGHT				1	1	1	.02
OTHER	3	1	1	2	7	7	.16

COMMERCIAL

AERIAL APPLICATION	23	39	37	143	242	239	5.58
CROP CONTROL RELATED FLIGHT	8	14	18	172	212	211	4.89
FIRE CONTROL			1	1	2	2	.05
FIRE CONTROL RELATED FLIGHT							
AERIAL MAPPING/PHOTOGRAPHY	1		2	5	8	8	.18
AERIAL ADVERTISING	1	2	3	8	14	14	.32
POWER AND PIPELINE PATROL	3	1		5	9	9	.21
FISH SPOTTING	2			4	6	6	.14
AIR TAXI-PASSENGER OPERATIONS	28	14	19	78	139	139	3.21
AIR TAXI-CARGO OPERATIONS	16	10	14	38	78	78	1.80
CONSTRUCTION WORK	1	1	2	3	7	7	.16
SCHEDULED PASSENGER SERVICE							
SCHEDULED CARGO SERVICE	1				1	1	.02
INTRA-STATE CHARTER PASSG.		1	1	1	3	3	.07
INTRA-STATE CHARTER CARGO.							
MILITARY CONTRACT-PASSENGER							
MILITARY CONTRACT-CARGO							
CHARTER CARGO-DOMESTIC	2	2	1	1	6	6	.14
CHARTER PASSG-DOMESTIC	2			3	5	5	.12
CHARTER-CARGO-INTERNATIONAL				1	1	1	.02
CHARTER-PASSG-INTERNATIONAL	1			1	2	2	.05
OTHER	6	4	8	6	24	23	.55

UNKNOWN/NOT REPORTED

## ANALYTIC TABLE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>MISCELLANEOUS</u>							
EXPERIMENTATION	2			3	5	5	.12
TEST	7	11	13	24	55	55	1.27
DEMONSTRATION	6	4	2	10	22	22	.51
FERRY	9	8	17	68	102	101	2.35
SEARCH AND RESCUE	3	1	1	3	8	8	.18
AIR SHOW/AIR RACING	5	1	3	4	13	12	.30
PARACHUTE JUMP	3	3	5	7	18	18	.42
PARACHUTE JUMP-AIR SHOW							
TOWING GLIDERS		2	3	11	16	16	.37
SEEDING CLOUDS							
HUNTING			1	5	6	6	.14
POLICE PATROL	2		1	1	4	4	.09
HIGHWAY TRAFFIC ADVISORY	2				2	2	.05
ALL OTHER PUBLIC FLYING	1	2	2	2	7	7	.16
OTHER	4	8	5	11	28	28	.65
UNKNOWN/NOT REPORTED	6		1	13	20	20	.46
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

INJURIES, ACCIDENTS  
U.S. GENERAL AVIATION  
(ALL OPERATIONS)

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	641	401	591	2703		4336
COPILOT	49	21	18	56		144
DUAL STUDENT	25	22	35	173		255
CHECK PILOT		1	1	4		6
FLIGHT ENGINEER	2			2		4
NAVIGATOR						
CABIN ATTENDANT	1	1	1	6		9
EXTRA CREW	6	3	6	12		27
PASSENGERS	701	329	462	2352		3844
 TOTAL	 1425	 778	 1114	 5308	 ABOARD	 8625
 * OTHER AIRCRAFT				1		1
OTHER GROUND	11	11	18	6		46
 GRAND TOTAL	 1436	 789	 1132	 5315		 8672

INVOLVES 4286 TOTAL ACCIDENTS  
INVOLVES 702 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
INSTRUCTIONAL  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	39	44	85	407		575
COPILOT			1	1		2
DUAL STUDENT	19	22	34	160		235
CHECK PILOT				4		4
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW		1				1
PASSENGERS	6	8	10	37		61
TOTAL	64	75	130	609	ABOARD	878
* OTHER AIRCRAFT	4	2	3	11		20
OTHER GROUND		1		1		2
GRAND TOTAL	68	78	133	621		900

INVOLVES 571 TOTAL ACCIDENTS  
INVOLVES 48 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
INSTRUCTIONAL (DUAL)  
ALL OPERATIONS

		INJURIES					
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT		18	26	35	150		229
COPILOT				1			1
DUAL STUDENT		17	21	32	151		221
CHECK PILOT							
FLIGHT ENGINEER							
NAVIGATOR							
CABIN ATTENDANT			1				1
EXTRA CREW							
PASSENGERS		3	6	9	32		50
TOTAL		38	54	77	333	ABOARD	502
* OTHER AIRCRAFT		5	1	3	8		17
OTHER GROUND					1		1
GRAND TOTAL		43	55	80	342		520

INVOLVES 227 TOTAL ACCIDENTS  
INVOLVES 25 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
INSTRUCTIONAL (SOLO-SUPERVISED)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	12	6	36	149		203
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						
TOTAL	12	6	36	149	ABOARD	203
* OTHER AIRCRAFT	2			5		7
OTHER GROUND						
GRAND TOTAL	14	6	36	154		210

INVOLVES 203 TOTAL ACCIDENTS  
INVOLVES 12 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
INSTRUCTIONAL (CHECK)  
ALL OPERATIONS

		INJURIES						
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL	
PILOT		3		1	8			12
COPILOT								
DUAL STUDENT		2	1	1	3			7
CHECK PILOT					4			4
FLIGHT ENGINEER								
NAVIGATOR								
CABIN ATTENDANT								
EXTRA CREW								
PASSENGERS					2			2
TOTAL		5	1	2	17		ABOARD	25
OTHER AIRCRAFT								
OTHER GROUND								
GRAND TOTAL		5	1	2	17			25

INVOLVES 12 TOTAL ACCIDENTS  
INVOLVES 3 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
INSTRUCTIONAL (TRAINING)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	6	12	13	100		131
COPILOT				1		1
DUAL STUDENT			1	6		7
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	3	2	1	3		9
 TOTAL	 9	 14	 15	 110	 ABOARD	 148
 * OTHER AIRCRAFT		1		1		2
OTHER GROUND		1				1
 GRAND TOTAL	 9	 16	 15	 111		 151

INVOLVES 131 TOTAL ACCIDENTS  
INVOLVES 9 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



INJURIES, ACCIDENTS  
NONCOMMERCIAL (PLEASURE/PERSONAL TRANSPORTATION)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	376	196	303	1268		2143
COPILOT	16	8	6	14		44
DUAL STUDENT	5		1	3		9
CHECK PILOT			1			1
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT				4		4
EXTRA CREW			1			1
PASSENGERS	467	231	322	1579		2599
 TOTAL	 864	 435	 634	 2868	 ABOARD	 4801
 * OTHER AIRCRAFT	 10		 3	 18		 31
OTHER GROUND	2	1	13	3		19
 GRAND TOTAL	 876	 436	 650	 2889		 4851

INVOLVES 2129 TOTAL ACCIDENTS  
INVOLVES 420 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
NONCOMMERCIAL (PRACTICE)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	20	14	18	114		166
COPILOT	2	1	1	2		6
DUAL STUDENT				5		5
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW				1		1
PASSENGERS	2	7	5	30		44
 TOTAL	 24	 22	 24	 152	 ABOARD	 222
 * OTHER AIRCRAFT	 1	 1		 8		 10
OTHER GROUND						
 GRAND TOTAL	 25	 23	 24	 160		 232

INVOLVES 166 TOTAL ACCIDENTS  
INVOLVES 21 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
NONCOMMERCIAL (BUSINESS-NONPROFESSIONAL PILOT)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	52	24	29	194		299
COPILOT	6		2	5		13
DUAL STUDENT	1			2		3
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW				1		1
PASSENGERS	30	18	24	162		234
TOTAL	89	42	55	364	ABOARD	550
* OTHER AIRCRAFT	6		1	4		11
OTHER GROUND	2					2
GRAND TOTAL	97	42	56	368		563

INVOLVES 299 TOTAL ACCIDENTS  
INVOLVES 53 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
NONCOMMERCIAL (CORPORATE/EXECUTIVE-PROFESSIONAL PILOT)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	16	4	7	37		64
COPILOT	5	4	2	7		18
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	28	6	11	53		98
TOTAL	49	14	20	97	ABOARD	180
* OTHER AIRCRAFT	2					2
OTHER GROUND			1			1
GRAND TOTAL	51	14	21	97		183

INVOLVES 64 TOTAL ACCIDENTS  
INVOLVES 18 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
NONCOMMERCIAL (AERIAL SURVEY)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	4	3	2	7		16
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	6	5	1	4		16
TOTAL	10	8	3	11	ABOARD	32
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	10	8	3	11		32

INVOLVES 16 TOTAL ACCIDENTS  
INVOLVES .5 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
NONCOMMERCIAL (OTHER)  
ALL OPERATIONS

INJURIES

	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	3	1	1	3		8
COPILOT				1		1
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	1		1			2
TOTAL	4	1	2	4		11

ABOARD

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL	4	1	2	4		11
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INVOLVES	8	TOTAL ACCIDENTS
INVOLVES	3	FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (AERIAL APPLICATION-CROP CONTROL)  
ALL OPERATIONS

		INJURIES					
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT		22	37	37	146		242
COPILOT		1					1
DUAL STUDENT							
CHECK PILOT							
FLIGHT ENGINEER							
NAVIGATOR							
CABIN ATTENDANT							
EXTRA CREW					1		1
PASSENGERS					1		1
TOTAL		23	37	37	148	ABOARD	245
OTHER AIRCRAFT							
OTHER GROUND		1	1				2
GRAND TOTAL		24	38	37	148		247

INVOLVES 239 TOTAL ACCIDENTS  
INVOLVES 22 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (ASSOCIATED CROP CONTROL-TO OR FROM)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	7	13	17	175		212
COPILOT				1		1
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	2			3		5
TOTAL	9	13	17	179	ABOARD	218
* OTHER AIRCRAFT				3		3
OTHER GROUND		1	1			2
GRAND TOTAL	9	14	18	182		223

INVOLVES 211 TOTAL ACCIDENTS  
INVOLVES 7 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



INJURIES, ACCIDENTS  
COMMERCIAL (FIRE CONTROL)  
ALL OPERATIONS

		INJURIES				
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN
						TOTAL
PILOT				1	1	2
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						
TOTAL				1	1	2
						ABOARD
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL				1	1	2
INVOLVES	2	TOTAL ACCIDENTS				
INVOLVES		FATAL ACCIDENTS				

INJURIES, ACCIDENTS  
 COMMERCIAL (ASSOCIATED FIRE CONTROL-TO OR FROM)  
 ALL OPERATIONS

INJURIES

PILOT  
 COPILOT  
 DUAL STUDENT  
 CHECK PILOT  
 FLIGHT ENGINEER  
 NAVIGATOR  
 CABIN ATTENDANT  
 EXTRA CREW  
 PASSENGERS

FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
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TOTAL

ABOARD

OTHER AIRCRAFT  
 OTHER GROUND

GRAND TOTAL

INVOLVES  
 INVOLVES

TOTAL ACCIDENTS  
 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (AERIAL MAPPING/PHOTOGRAPHY)  
ALL OPERATIONS

		INJURIES					
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT		1		2	5		8
COPILOT		1					1
DUAL STUDENT							
CHECK PILOT							
FLIGHT ENGINEER							
NAVIGATOR							
CABIN ATTENDANT							
EXTRA CREW							
PASSENGERS				5	5		10
TOTAL		2		7	10	ABOARD	19
OTHER AIRCRAFT							
OTHER GROUND							
GRAND TOTAL		2		7	10		19

INVOLVES 8 TOTAL ACCIDENTS  
INVOLVES 1 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (AERIAL ADVERTISING)  
ALL OPERATIONS

		INJURIES						
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL	
PILOT			2	2	10			14
COPILOT								
DUAL STUDENT								
CHECK PILOT								
FLIGHT ENGINEER								
NAVIGATOR								
CABIN ATTENDANT								
EXTRA CREW				1				1
PASSENGERS					1			1
TOTAL			2	3	11		ABOARD	16
OTHER AIRCRAFT								
OTHER GROUND		1						1
GRAND TOTAL		1	2	3	11			17

INVOLVES 14 TOTAL ACCIDENTS  
INVOLVES 1 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (POWER AND PIPELINE PATROL)  
ALL OPERATIONS

		INJURIES					
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT		3	1		5		9
COPILOT							
DUAL STUDENT							
CHECK PILOT							
FLIGHT ENGINEER							
NAVIGATOR							
CABIN ATTENDANT				1			1
EXTRA CREW			2		4		6
PASSENGERS							
TOTAL		3	3	1	9	ABOARD	16
OTHER AIRCRAFT							
OTHER GROUND							
GRAND TOTAL		3	3	1	9		16

INVOLVES 9 TOTAL ACCIDENTS  
INVOLVES 3 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (FISH SPOTTING)  
ALL OPERATIONS

	INJURIES					
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	2			4		6
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	1			1		2
TOTAL	3			5		8
					ABOARD	
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	3			5		8

INVOLVES 6 TOTAL ACCIDENTS  
INVOLVES 2 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (AIR TAXI-PASSENGER)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	23	7	17	92		139
COPILOT	6		1	10		17
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT	1	1		2		4
EXTRA CREW						
PASSENGERS	100	34	46	297		477
 TOTAL	 130	 42	 64	 401	 ABOARD	 637
 * OTHER AIRCRAFT				3		3
OTHER GROUND	3	1				4
 GRAND TOTAL	 133	 43	 64	 404		 644

INVOLVES 139 TOTAL ACCIDENTS  
INVOLVES 28 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
COMMERCIAL (AIR TAXI-CARGO)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	16	9	13	40		78
COPILOT	3	2	2	7		14
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT			1			1
EXTRA CREW	1			4		5
PASSENGERS	2		2	4		8
 TOTAL	 22	 11	 18	 55	 ABOARD	 106
 * OTHER AIRCRAFT				1		1
OTHER GROUND		2	3	2		7
 GRAND TOTAL	 22	 13	 21	 58		 114

INVOLVES 78 TOTAL ACCIDENTS  
INVOLVES 16 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



INJURIES, ACCIDENTS  
COMMERCIAL (CONSTRUCTION-ROTORCRAFT)  
ALL OPERATIONS

INJURIES					
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN
PILOT		1	2	4	
COPILOT				1	
DUAL STUDENT					
CHECK PILOT					
FLIGHT ENGINEER					
NAVIGATOR					
CABIN ATTENDANT					
EXTRA CREW					
PASSENGERS				1	
TOTAL		1	2	6	ABOARD
OTHER AIRCRAFT					
OTHER GROUND	1				
GRAND TOTAL	1	1	2	6	

INVOLVES 7 TOTAL ACCIDENTS  
INVOLVES 1 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (SCHEDULED PASSENGER-INTRASTATE CARRIER)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT						
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						

TOTAL

ABOARD

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL

INVOLVES  
INVOLVES

TOTAL ACCIDENTS  
FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (SCHEDULED CARGO-INTRASTATE CARRIER)  
ALL OPERATIONS

		INJURIES				
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN
		-----				
		-----	-----	-----	-----	-----
PILOT		1				
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						
TOTAL		1				
						ABOARD
						1
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL		1				
						1

INVOLVES 1 TOTAL ACCIDENTS  
INVOLVES 1 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COMMERCIAL (OTHER)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	10	5	8	18		41
COPILOT	4	3		1		8
DUAL STUDENT						
CHECK PILOT		1				1
FLIGHT ENGINEER	2					2
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1	1				2
PASSENGERS	9	3	8	42		62
TOTAL	26	13	16	61	ABOARD	116

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL	26	13	16	61		116
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INVOLVES	40	TOTAL ACCIDENTS
INVOLVES	11	FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (EXPERIMENTATION)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	1	1		3		5
COPILOT	1					1
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						
TOTAL	2	1		3	ABOARD	6
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	2	1		3		6

INVOLVES 5 TOTAL ACCIDENTS  
INVOLVES 2 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (TEST)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	7	11	12	25		55
COPILOT	1			1		2
DUAL STUDENT				1		1
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW			2	3		5
PASSENGERS	6	2	1	9		18
TOTAL	14	13	15	39	ABORD	81
* OTHER AIRCRAFT				2		2
OTHER GROUND						
GRAND TOTAL	14	13	15	41		83

INVOLVES 55 TOTAL ACCIDENTS  
INVOLVES 7 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

INJURIES, ACCIDENTS  
MISCELLANEOUS (DEMONSTRATION)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	4	5	2	11		22
COPILOT				2		2
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	17	6	2	17		42
TOTAL	21	11	4	30	ABOARD	66
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	21	11	4	30		66

INVOLVES 22 TOTAL ACCIDENTS  
INVOLVES 6 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (FERRY)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	8	9	16	69		102
COPILOT	1	1	1	2		5
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER				1		1
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1					1
PASSENGERS	2			16		18
TOTAL	12	10	17	88	ABOARD	127
* OTHER AIRCRAFT	1			3		4
OTHER GROUND						
GRAND TOTAL	13	10	17	91		131

INVOLVES 101 TOTAL ACCIDENTS  
INVOLVES 8 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



INJURIES, ACCIDENTS  
MISCELLANEOUS (SEARCH AND RESCUE)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	3	1		4		8
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1	1				2
PASSENGERS	2		1	3		6
TOTAL	6	2	1	7	ABOARD	16
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	6	2	1	7		16

INVOLVES 8 TOTAL ACCIDENTS  
INVOLVES 3 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (AIR SHOW/RACING)  
ALL OPERATIONS

INJURIES

	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	5	1	2	5		13
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1			1		2
PASSENGERS			1	12		13
TOTAL	6	1	3	18		28

ABOARD

28

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL 6 1 3 18 28

INVOLVES 12 TOTAL ACCIDENTS  
INVOLVES 5 FATAL ACCIDENTS

INJURIES • ACCIDENTS  
MISCELLANEOUS (PARACHUTE JUMP-SPORTING)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	3	2	5	8		18
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	8	2	13	53		76

TOTAL	11	4	18	61	ABOARD	94
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OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL	11	4	18	61		94
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INVOLVES 18 TOTAL ACCIDENTS  
INVOLVES 3 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
 MISCELLANEOUS (PARACHUTE JUMP-AIR SHOW)  
 ALL OPERATIONS

INJURIES

	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
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PILOT  
 COPILOT  
 DUAL STUDENT  
 CHECK PILOT  
 FLIGHT ENGINEER  
 NAVIGATOR  
 CABIN ATTENDANT  
 EXTRA CREW  
 PASSENGERS

TOTAL

ABOARD

OTHER AIRCRAFT  
 OTHER GROUND

GRAND TOTAL

INVOLVES  
 INVOLVES  
 TOTAL ACCIDENTS  
 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (TOWING GLIDERS)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT		2	2	12		16
COPILOT						
DUAL STUDENT				1		1
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW			3	2		5
PASSENGERS						
TOTAL		2	5	15		22
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL		2	5	15		22

INVOLVES 16 TOTAL ACCIDENTS  
INVOLVES FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (SEEDING CLOUDS)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT						
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS						

TOTAL

ABOARD

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL

INVOLVES  
INVOLVES

TOTAL ACCIDENTS  
FATAL ACCIDENTS

INJURIES, ACCIDENTS  
MISCELLANEOUS (HUNTING)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT			1	5		6
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW				4		4
PASSENGERS						
TOTAL			1	9		10
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL			1	9		10

INVOLVES 6 TOTAL ACCIDENTS  
INVOLVES FATAL ACCIDENTS

INJURIES • ACCIDENTS  
MISCELLANEOUS (POLICE PATROL INCLUDES TRAFFIC ADVISORY)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	2		1	1		4
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1		1			2
PASSENGERS		1		1		2
TOTAL	3	1	2	2		8
					ABOARD	
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	3	1	2	2		8

INVOLVES 4 TOTAL ACCIDENTS  
INVOLVES 2 FATAL ACCIDENTS



INJURIES, ACCIDENTS  
MISCELLANEOUS (HIGHWAY TRAFFIC ADVISORY NON POLICE)  
ALL OPERATIONS

	INJURIES					
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	2					2
COPILOT						
DUAL STUDENT						
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	1					1
TOTAL	3					3
					ABOARD	
OTHER AIRCRAFT						
OTHER GROUND		4				4
GRAND TOTAL	3	4				7

INVOLVES 2 TOTAL ACCIDENTS  
INVOLVES 2 FATAL ACCIDENTS

INJURIES-ACCIDENTS  
MISCELLANEOUS (OTHER)  
ALL OPERATIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	11	8	6	30		55
COPILOT	2	2	2	1		7
DUAL STUDENT				1		1
CHECK PILOT						
FLIGHT ENGINEER				1		1
NAVIGATOR						
CABIN ATTENDANT				1		1
EXTRA CREW						
PASSENGERS	11	4	6	11		32
TOTAL	24	14	14	45	ABOARD	97
* OTHER AIRCRAFT				1		1
OTHER GROUND	1					1
GRAND TOTAL	25	14	14	46		99

INVOLVES 55 TOTAL ACCIDENTS  
INVOLVES 11 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.

SELECTED ACCIDENT DATA

ALL OPERATIONS

1977

<u>Pilot Total Time</u>	<u>Total</u>	<u>Accident Records</u>	<u>Fatal</u>
0- 25 Hours	147		16
26- 50 Hours	146		14
51- 100 Hours	331		52
101- 300 Hours	751 2		123
301- 500 Hours	427 4		76
501- 1000 Hours	573 3		107
1001- 3000 Hours	896 m		141
3001- 5000 Hours	402		49
5001- 8000 Hours	270		44
8001-10,000 Hours	95 L		19
over-10,000 Hours	199 1		39
Unknown/not reported	99		40
	4336		

Pilot Time In Type Aircraft

5- Or less Hours	221		22
6- 25 Hours	723	(944) 2	100
26- 50 Hours	548		81
51- 100 Hours	604	(1152) m	90
101- 300 Hours	(885) 3		108
301- 500 Hours	(352) 4		40
501- 1000 Hours	314		49
1001- 2000 Hours	218		25
2001- 3000 Hours	(82) L		5
over- 3000 Hours	86		11
Unknown/not reported	303		189

## ANALYTIC TABLE

PILOT AGE BY INJURY INDEX  
ALL OPERATIONSFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

15			1	1	2	2	.05
16	1	1		3	5	5	.12
17	3	2	2	11	18	18	.42
18	2	1	8	13	24	24	.55
19	2	1	10	16	29	29	.67
20	4	4	7	37	52	52	1.20
21	9	5	13	39	66	66	1.52
22	10	8	11	47	76	76	1.75
23	24	12	4	61	101	101	2.33
24	16	11	16	68	111	111	2.56
25	14	11	16	73	114	114	2.63
26	19	7	18	64	108	108	2.49
27	17	10	24	62	113	113	2.61
28	26	17	18	83	144	144	3.32
29	20	11	31	97	159	159	3.67
30	25	13	28	107	173	173	3.99
31	26	20	19	78	143	143	3.30
32	15	16	17	88	136	136	3.14
33	12	10	19	84	125	124	2.88
34	20	14	22	102	158	158	3.64
35	15	8	23	70	116	116	2.68
36	16	16	13	74	119	119	2.74
37	18	15	16	65	114	114	2.63
38	16	12	15	62	105	105	2.42
39	18	10	14	64	106	106	2.44
40	16	11	18	67	112	112	2.58
41	25	12	14	68	119	119	2.74
42	17	9	10	55	91	91	2.10
43	23	10	15	64	112	112	2.58
44	21	8	13	60	102	102	2.35
45	15	6	15	61	97	97	2.24
46	17	14	10	70	111	111	2.56
47	21	11	13	49	94	94	2.17
48	15	10	12	57	94	94	2.17
49	18	15	15	70	118	117	2.72
50	16	10	10	43	79	79	1.82
51	20	9	11	34	74	74	1.71

## ANALYTIC TABLE

Pilot age	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
52	8	8	10	46	72	72	1.66
53	15	4	15	33	67	67	1.55
54	16	10	5	35	66	66	1.52
55	17	7	17	27	68	68	1.57
56	13	4	12	33	62	62	1.43
57	12	2	8	17	39	39	.90
58	14	3	6	14	37	37	.85
59	6	5	6	30	47	47	1.08
60	10	3	3	9	25	25	.58
61	6		2	17	25	25	.58
62	5	3	6	9	23	23	.53
63	4	4	2	8	18	18	.42
64	3	2	2	10	17	17	.39
65	1	2	2	9	14	14	.32
66	5	3	2	4	14	14	.32
67	2			3	5	5	.12
68			1	2	3	3	.07
69	3		2	3	8	8	.18
70	1			1	2	2	.05
72	1		1	1	3	3	.07
73	1			1	2	2	.05
74				3	3	3	.07
75	1			3	4	4	.09
77	1		1		2	2	.05
80				1	1	1	.02
Unknown	3	8	10	68	89	89	2.05
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

PILOT CERTIFICATE BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
STUDENT	52	23	66	301	442	442	10.19 4
PRIVATE	339	181	267	1031	1818	1808	41.93 m
COMMERCIAL	175	132	183	704	1194	1189	27.54 2
AIRLINE TRANSPORT	31	17	17	74	139	139	3.21 L
PRIVATE W/FLIGHT INSTRUCTOR	3			1	4	4	.09
COML WITH FLT INSTRUCTOR	88	56	77	349	570	566	13.15 3
ATR W/FLIGHT INSTRUCTOR	28	14	16	59	117	117	2.70
OTHER				1	1	1	.02
NONE	4	4	4	12	24	24	.55
UNKNOWN/NOT REPORTED		1	4	22	27	27	.62
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

CONDITIONS OF LIGHT BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
DAWN	11	3	9	39	62	62	1.43
DAYLIGHT	510	347	518	2212	3587	3542	82.73 m
DUSK	23	13	26	92	154	153	3.55 3
NIGHT (DARK)	157	53	62	154	426	422	9.82 2
NIGHT (MOONLIGHT-BRIGHT)	12	10	17	42	81	81	1.87 ✓
UNKNOWN/NOT REPORTED	7	2	2	15	26	26	.60
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

TYPE WEATHER CONDITIONS BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
VFR	508	394	588	2450	3940	3891	90.87
IFR	174	28	37	78	317	316	7.31
BELOW MINIMUMS	17	4	3	3	27	27	.62
UNKNOWN/NOT REPORTED	21	2	6	23	52	52	1.20
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

TYPE FLIGHT PLAN BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
NONE	543	366	528	2147	3584	3544	82.66
VFR	73	30	72	235	410	407	9.46
IFR	91	24	25	135	275	274	6.34
CONTROLLED VFR			1		1	1	.02
IFR (VFR CONDITIONS ON TOP)	3		1		4	4	.09
TOWER EN ROUTE CONTROL SERVICE							
DVFR	1				1	1	.02
VFR FLIGHT FOLLOWING SERVICE	1		3		4	4	.09
SPECIAL VFR	2		2	3	7	7	.16
OTHER	2	1	1	9	13	13	.30
UNKNOWN/NOT REPORTED	4	7	1	25	37	37	.85
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

MONTH OF OCCURRENCE BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
01	40	17	43	155	255	250	5.88 11
02	42	29	39	169	279	279	6.43 9
03	62	25	55	191	333	330	7.68 7
04	59	45	46	203	353	348	8.14 6
05	57	43	59	249	408	403	9.41 4
06	63	46	68	267	444	442	10.24 3
07	71	57	78	307	513	511	11.83 M
08	90	48	63	303	504	497	11.62 2
09	76	31	59	238	404	400	9.32 5
10	50	30	41	203	324	319	7.47 8
11	51	30	40	130	251	245	5.79 12
12	59	27	43	139	268	262	6.18 10
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

MONTH OF OCCURRENCE BY TYPE OF WEATHER CONDITIONS  
ALL OPERATIONS

	VFR	IFR	Below Minimums	Unknown	RECORDS	ACCIDENTS	PERCENT
01	218	32	2	3	255	250	5.88
02	247	26	2	4	279	279	6.43
03	297	31	2	3	333	330	7.68
04	329	20	2	2	353	348	8.14
05	383	19	3	3	408	403	9.41
06	424	15	1	4	444	442	10.24
07	487	18	2	6	513	511	11.83
08	470	23	3	8	504	497	11.62
09	368	27		9	404	400	9.32
10	294	25	1	4	324	319	7.47
11	205	40	3	3	251	245	5.79
12	218	41	6	3	268	262	6.18
RECORDS	3940	317	27	52	4336		
ACCIDENTS	3891	316	27	52		4286	
PERCENTS	90.9	7.3	.6	1.2			



## ANALYTIC TABLE

MONTH OF OCCURRENCE BY FIRST TYPE OF ACCIDENT  
ALL OPERATIONS

FIRST TYPE OF ACCIDENT	01	02	03	04	05	06	07	08	09	10	11	12	RECORDS	ACCIDENTS
GROUND-WATER LOOP-SWERVE	36	44	47	39	53	53	48	45	41	42	24	29	501	501
DRAGGED WINGTIP POD OR FLOAT		1		2	1	1	3			1	2		11	11
WHEELS-UP LANDING	3	4	7	10	4	5	7	5	9	6	4	7	71	71
WHEELS-DOWN LANDING IN WATER				2	3	1		1	1		1		9	9
GEAR COLLAPSED	7	7	9	3	7	6	13	5	7	6	2	6	78	78
GEAR RETRACTED	3	2	2	6	6	5	1	11	3	7	1	5	52	52
HARD LANDING	13	13	15	28	27	28	31	23	18	17	21	17	251	251
NOSE OVER/DOWN	7	14	23	21	9	16	10	9	13	12	5	7	146	146
ROLL OVER			3	2	2		1	1	1	1	1	1	13	13
OVERSHOOT	7	7	11	8	21	14	22	29	16	10	6	10	161	161
UNDERSHOOT	9	10	17	10	15	17	18	14	18	7	11	11	157	157
<u>COLLISION BETWEEN AIRCRAFT</u>														
BOTH IN FLIGHT	6		2	10	8	4	2	8	6	8	6	8	68	34
ONE AIRBORNE			2					2	2		2	2	10	5
BOTH ON GROUND	4		2		2		3	4		2	4	2	23	12
<u>COLLISION WITH GROUND/WATER</u>														
CONTROLLED	13	11	21	13	15	23	16	26	16	17	16	13	200	200
UNCONTROLLED	10	7	14	20	8	19	18	21	24	13	17	17	188	188
<u>COLLIDED WITH</u>														
WIRES/POLES	6	7	6	9	17	19	24	16	13	15	6	5	143	143
TREES	5	10	13	15	16	12	17	22	19	11	19	12	171	171
RESIDENCE/S						2					1		3	3
BUILDING/S	1	1		1	2		2		2				9	9
FENCE, FENCEPOSTS	3	2	5	3	8	7	7	4	5	8	2	2	56	56
ELECTRONIC TOWERS					1						1		2	2
RUNWAY OR APPROACH LIGHTS	1				1	1		1	1	1			6	6
AIRPORT HAZARD						1	1			1	1	1	5	5
ANIMALS			1	1	1	1	1	1	1	1	1		9	9
CROP		1	1			2	5	8	3	5			25	25
FLAGMAN LOADER					1								1	1
DITCHES			4	1	2	1	7	4	4	2	2		27	27
SNOWBANK	9	15	3	1							1	3	32	32
PARKED AIRCRAFT (UNATTENDED)	3	3		1	3	2	2	2		3	1		20	20
AUTOMOBILE				1		1	3	1	1	2	2	1	12	12
DIRT BANK	2	1	3	2	6	3	9	3	7	2	2	1	41	41
OTHER	2	5	4	2	5	11	9	8	13	7	5	6	77	77
BIRD STRIKE				2									2	2

ANALYTIC TABLE  
MONTH OF OCCURRENCE

FIRST TYPE OF ACCIDENT	MONTH OF OCCURRENCE												RECORDS	ACCIDENTS
	01	02	03	04	05	06	07	08	09	10	11	12		
STALL	7	10	8	11	13	12	21	23	13	7	5	9	139	139
SPIN	7	8	11	19	7	11	10	10	12	14	4	5	118	118
SPIRAL		1		3	3	2	3	1	2	3	1		19	19
MUSH	7	11	13	14	33	22	39	28	21	12	4	6	210	210
<u>FIRE OR EXPLOSION</u>														
IN FLIGHT			1		1	2	2	3	5	3		1	18	18
ON GROUND	2				1	1					1		5	5
<u>AIRFRAME FAILURE</u>														
IN FLIGHT	6	6	6	8	7	9	5	6	9	5	5	4	76	76
ON GROUND	2			2	3	2		1	1	1	1	1	14	14
ENGINE TEARAWAY														
ENGINE FAILURE OR MALFUNCTION	61	72	72	69	84	116	140	140	80	68	54	69	1025	1025
PROPELLER/ROTOR FAILURE														
PROPELLER	2		2	3	1	3	1	3	4	4	2	2	27	27
TAIL ROTOR	4	1	1	1	2	1	1				1	1	13	13
MAIN ROTOR		1	1	2				1		1	1	1	8	8
PROP ROTOR ACNT TO PERSON	1			3	2	1	3	1	4			1	16	16
JET INTAKE/EXH ACNT TO PERS														
PROPELLER/JET/ROTOR BLAST		1			1	1		1					4	4
TURBULENCE	2		1	2	2	2	1	3	4	1			18	18
HAIL DAMAGE TO AIRCRAFT								1					1	1
LIGHTNING STRIKE														
EVASIVE MANEUVER		1											1	1
UNCONTROLLED ALT DEVIATION														
DITCHING	1					1							2	2
MISSING ACFT NOT RECOVERED			2			2	1	2	1	1	2	1	12	12
MISCELLANEOUS/OTHER	2		1	1	1	1	4	2	3		1		16	16
UNDETERMINED	1	1		1	2		1	2	3		1	2	14	14
RECORDS	255	279	333	353	408	444	513	504	404	324	251	268	4336	
ACCIDENTS	250	279	330	348	403	442	511	497	400	319	245	262		4286

## ANALYTIC TABLE

STATE OF OCCURRENCE BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
ALABAMA	9	7	10	57	83	83	1.91
ALASKA	31	17	31	165	244	242	5.63
ARIZONA	19	13	24	66	122	121	2.81
ARKANSAS	9	8	5	69	91	90	2.10
CALIFORNIA	94	44	62	296	496	487	11.44
COLORADO	21	18	18	59	116	115	2.68
CONNECTICUT	5	4	5	14	28	27	.65
DELAWARE		1		1	2	2	.05
FLORIDA	33	14	30	137	214	211	4.94
GEORGIA	20	12	15	63	110	110	2.54
HAWAII	7	2	4	5	18	17	.42
IDAHO	12	7	4	25	48	48	1.11
ILLINOIS	20	13	19	83	135	133	3.11
INDIANA	13	10	18	48	89	87	2.05
IOWA	8	8	7	35	58	58	1.34
KANSAS	5	2	17	60	84	84	1.94
KENTUCKY	8	4	10	12	34	34	.78
LOUISIANA	17	14	16	57	104	104	2.40
MAINE	3	2	4	22	31	31	.71
MARYLAND	4	6	11	16	37	37	.85
MASSACHUSETTS	9	5	5	30	49	49	1.13
MICHIGAN	15	16	15	60	106	106	2.44
MINNESOTA	6	6	11	68	91	90	2.10
MISSISSIPPI	14	10	9	24	57	56	1.31
MISSOURI	13	8	14	58	93	92	2.14
MONTANA	4	3	6	46	59	59	1.36
NEBRASKA	6	3	5	38	52	52	1.20
NEVADA	13	4	10	28	55	54	1.27
NEW HAMPSHIRE	3	1	3	13	20	20	.46
NEW JERSEY	3	5	8	21	37	37	.85
NEW MEXICO	16	11	14	48	89	89	2.05
NEW YORK	17	10	16	92	135	133	3.11
NORTH CAROLINA	13	6	13	45	77	76	1.78
NORTH DAKOTA	1	2	2	8	13	13	.30
OHIO	15	11	21	64	111	110	2.56
OKLAHOMA	12	8	13	39	72	72	1.66
OREGON	18	10	14	53	95	93	2.19

## ANALYTIC TABLE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
PENNSYLVANIA	21	11	21	63	116	115	2.68
RHODE ISLAND	1		2	2	5	5	.12
SOUTH CAROLINA	7	1	7	29	44	44	1.01
SOUTH DAKOTA	9	5	4	26	44	43	1.01
TENNESSEE	13	6	7	16	42	41	.97
TEXAS	45	27	41	208	321	311	7.40
UTAH	9	5	8	19	41	41	.95
VERMONT	3	2		4	9	9	.21
VIRGINIA	13	9	9	28	59	56	1.36
WASHINGTON	29	12	17	39	97	97	2.24
WEST VIRGINIA	7	4	3	7	21	21	.48
WISCONSIN	13	10	11	42	76	75	1.75
WYOMING	11	4	8	24	47	47	1.08
DISTRICT OF COLUMBIA							
UNKNOWN/NOT REPORTED	11				11	11	.25
PUERTO RICO	2	2	2	4	10	10	.23
VIRGIN ISLANDS				3	3	3	.07
SAMOA							
OTHER-U.S. TERRITORIES & POSSES.				1	1	1	.02
CANADA				2	2	2	.05
MEXICO		2	1	8	11	11	.25
CENTRAL AMERICA							
SOUTH AMERICA							
EUROPE							
ASIA		1			1	1	.02
AFRICA							
AUSTRALIA							
ICELAND							
GREENLAND							
OTHER-FOREIGN COUNTRIES	5	2	2	3	12	12	.28
PACIFIC OCEAN NORTH LATITUDES	1				1	1	.02
PACIFIC OCEAN SOUTH LATITUDES			1		1	1	.02
ATLANTIC OCEAN NORTH LAT.	3		1		4	4	.09
ATLANTIC OCEAN SOUTH LAT.	1				1	1	.02
OTHER-INTERNATIONAL WATERS				1	1	1	.02
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

STATE OF OCCURRENCE BY AIRCRAFT DAMAGE  
ALL OPERATIONS

	<div>DESTROYED</div> <div>SUBSTANTIAL</div> <div>MINOR</div> <div>NONE</div>				RECORDS	ACCIDENTS	PERCENT
ALABAMA	15	65	3		83	83	1.91
ALASKA	30	209	3	2	244	242	5.63
ARIZONA	29	92		1	122	121	2.81
ARKANSAS	25	65		1	91	90	2.10
CALIFORNIA	146	348	1	1	496	487	11.44
COLORADO	33	81		2	116	115	2.68
CONNECTICUT	6	21	1		28	27	.65
DELAWARE	1	1			2	2	.05
FLORIDA	55	155	2	2	214	211	4.94
GEORGIA	40	69	1		110	110	2.54
HAWAII	10	7	1		18	17	.42
IDAHO	17	31			48	48	1.11
ILLINOIS	29	106			135	133	3.11
INDIANA	20	66	3		89	87	2.05
IOWA	13	45			58	58	1.34
KANSAS	13	71			84	84	1.94
KENTUCKY	10	23		1	34	34	.78
LOUISIANA	39	63	1	1	104	104	2.40
MAINE	4	27			31	31	.71
MARYLAND	9	28			37	37	.85
MASSACHUSETTS	12	37			49	49	1.13
MICHIGAN	30	74	1	1	106	106	2.44
MINNESOTA	11	80			91	90	2.10
MISSISSIPPI	28	29			57	56	1.31
MISSOURI	19	73		1	93	92	2.14
MONTANA	8	50	1		59	59	1.36
NEBRASKA	10	42			52	52	1.20
NEVADA	17	37	1		55	54	1.27
NEW HAMPSHIRE	1	19			20	20	.46
NEW JERSEY	9	28			37	37	.85
NEW MEXICO	19	69		1	89	89	2.05
NEW YORK	25	109		1	135	133	3.11
NORTH CAROLINA	23	54			77	76	1.78
NORTH DAKOTA	2	11			13	13	.30
OHIO	15	96			111	110	2.56
OKLAHOMA	22	49		1	72	72	1.66
OREGON	31	61	1	2	95	93	2.19

## ANALYTIC TABLE

	<div>DESTROYED SUBSTANTIAL MINOR NONE</div>				RECORDS	ACCIDENTS	PERCENT
PENNSYLVANIA	23	90	1	2	116	115	2.68
RHODE ISLAND	1	4			5	5	.12
SOUTH CAROLINA	14	30			44	44	1.01
SOUTH DAKOTA	9	35			44	43	1.01
TENNESSEE	19	21	2		42	41	.97
TEXAS	89	228	3	1	321	311	7.40
UTAH	15	26			41	41	.95
VERMONT	2	7			9	9	.21
VIRGINIA	17	42			59	56	1.36
WASHINGTON	38	59			97	97	2.24
WEST VIRGINIA	9	12			21	21	.48
WISCONSIN	18	57		1	76	75	1.75
WYOMING	13	34			47	47	1.08
DISTRICT OF COLUMBIA							
UNKNOWN/NOT REPORTED	11				11	11	.25
PUERTO RICO	5	4		1	10	10	.23
VIRGIN ISLANDS	1	2			3	3	.07
SAMOA							
OTHER-U.S.TERRITORIES&POSSES.		1			1	1	.02
CANADA		2			2	2	.05
MEXICO	3	7	1		11	11	.25
CENTRAL AMERICA							
SOUTH AMERICA							
ASIA	1				1	1	.02
AUSTRALIA							
OTHER-FOREIGN COUNTRIES	7	5			12	12	.28
PACIFIC OCEAN NORTH LATITUDES	1				1	1	.02
PACIFIC OCEAN SOUTH LATITUDES	1				1	1	.02
ATLANTIC OCEAN NORTH LAT.	4				4	4	.09
ATLANTIC OCEAN SOUTH LAT.	1				1	1	.02
OTHER-INTERNATIONAL WATERS	1				1	1	.02
RECORDS	1129	3157	27	23	4336		
ACCIDENTS	1119	3138	27	23		4286	
PERCENTS	26.0	72.8	.6	.5			

## ANALYTIC TABLE

TYPE AIRCRAFT BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
FIXED-WING	683	375	558	2356	3972	3925	91.61
HELICOPTER	25	31	60	148	264	264	6.09
GLIDER	7	13	13	45	78	77	1.80
BALLOON	1	8	1	2	12	12	.28
BLIMP							
DIRIGIBLE							
ROCKET							
CONVERTIPLANE							
GYROPLANE	4	1	2	3	10	10	.23
OTHER							
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

TYPE AIRCRAFT BY AIRCRAFT DAMAGE  
ALL OPERATIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
FIXED-WING	1041	2895	20	16	3972	3925	91.61
HELICOPTER	73	187	2	2	264	264	6.09
GLIDER	10	65	3		78	77	1.80
BALLOON	1	4	2	5	12	12	.28
BLIMP							
DIRIGIBLE							
ROCKET							
CONVERTIPLANE							
GYROPLANE	4	6			10	10	.23
OTHER							
RECORDS	1129	3157	27	23	4336		
ACCIDENTS	1119	3138	27	23		4286	
PERCENTS	26.0	72.8	.6	.5			

## ANALYTIC TABLE

TYPE POWER BY INJURY INDEX  
ALL OPERATIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
RECIPROCATING ENGINE	674	392	596	2456	4118	4073	94.97
TURBOJET ENGINE	6	2		6	14	14	.32
TURBOPROP ENGINE	18	8	4	11	41	41	.95
TURBOFAN ENGINE							
NONE	8	20	14	44	86	85	1.98
TURBOSHAFT	14	6	20	37	77	77	1.78
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

TYPE POWER BY AIRCRAFT DAMAGE  
ALL OPERATIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
RECIPROCATING ENGINE	1065	3018	20	15	4118	4073	94.97
TURBOJET ENGINE	9	5			14	14	.32
TURBOPROP ENGINE	22	18		1	41	41	.95
TURBOFAN ENGINE							
NONE	10	66	5	5	86	85	1.98
TURBOSHAFT	23	50	2	2	77	77	1.78
RECORDS	1129	3157	27	23	4336		
ACCIDENTS	1119	3138	27	23		4286	
PERCENTS	26.0	72.8	.6	.5			



## ANALYTIC TABLE

AIRPORT PROXIMITY VS INJURY INDEX  
ALL OPERATIONS

FATAL  
SERIOUS  
MINOR  
NONE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
ON AIRPORT	69	117	233	1514	1933	1906	44.58 M
ON SEAPLANE BASE	2		1	13	16	16	.37
ON HELIPORT		1		1	2	2	.05
ON BARGE/SHIP/PLATFORM	1	1	1	1	4	4	.09
IN TRAFFIC PATTERN	44	18	33	60	155	152	3.67
WITHIN 1/4 MILE	43	48	49	95	235	233	5.42 4
WITHIN 1/2 MILE	35	23	21	49	128	127	2.95
WITHIN 3/4 MILE	12	4	6	9	31	31	.71
WITHIN 1 MILE	26	16	22	40	104	104	2.40
WITHIN 2 MILES	41	17	19	35	112	112	2.58
WITHIN 3 MILES	29	11	11	20	71	70	1.64
WITHIN 4 MILES	19	6	4	15	44	43	1.01
WITHIN 5 MILES	24	1	3	10	38	36	.88
BEYOND 5 MILES	331	135	180	543	1189	1180	27.42 2
UNKNOWN/NOT REPORTED	44	30	51	149	274	272	6.32 3
RECORDS	720	428	634	2554	4336		
ACCIDENTS	702	424	627	2533		4286	
PERCENTS	16.6	9.9	14.6	58.9			

## ANALYTIC TABLE

FIRE AFTER IMPACT BY INJURY INDEX  
ALL OPERATIONS

FATAL  
SERIOUS  
MINOR  
NONE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
YES	190	62	38	70	360	357	95.24
UNKNOWN/NOT REPORTED	9		4	5	18	18	4.76
RECORDS	199	62	42	75	378		
ACCIDENTS	197	61	42	75		375	
PERCENTS	52.6	16.4	11.1	19.8			

**GENERAL AVIATION ACCIDENTS**

**SMALL FIXED-WING AIRCRAFT**



## ANALYTIC TABLE

FIRST TYPE OF ACCIDENT BY AIRCRAFT DAMAGE  
SMALL FIXED WINGFIRST  
TYPE OF ACCIDENT

DESTROYED  
SUBSTANTIAL  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

GROUND-WATER LOOP-SWERVE	12	474	2		488	488	12.40
DROGGED WINGTIP POD OR FLOAT	1	10			11	11	.28
WHEELS-UP LANDING	2	66	1		69	69	1.75
WHEELS-DOWN LANDING IN WATER	1	8			9	9	.23
GEAR COLLAPSED	1	74	1		76	76	1.93
GEAR RETRACTED	1	49	1		51	51	1.30
HARD LANDING	11	199			210	210	5.34
NOSE OVER/DOWN	4	138			142	142	3.61
ROLL OVER							
OVERSHOOT	12	142			154	154	3.91
UNDERSHOOT	18	123			141	141	3.58
<u>COLLISION BETWEEN AIRCRAFT</u>							
BOTH IN FLIGHT	27	31	4	1	63	33	1.60
ONE AIRBORNE	1	9			10	5	.25
BOTH ON GROUND	2	17	4		23	12	.58
<u>COLLISION WITH GROUND/WATER</u>							
CONTROLLED	103	68			171	171	4.35
UNCONTROLLED	134	25			159	159	4.04
<u>COLLIDED WITH</u>							
WIRES/POLES	51	57	1		109	109	2.77
TREES	81	78	1		160	160	4.07
RESIDENCE/S	3				3	3	.08
BUILDING/S	1	5			6	6	.15
FENCE, FENCEPOSTS	6	47			53	53	1.35
ELECTRONIC TOWERS		1			1	1	.03
RUNWAY OR APPROACH LIGHTS		5			5	5	.13
AIRPORT HAZARD		5			5	5	.13
ANIMALS	1	8			9	9	.23
CROP	2	20			22	22	.56
FLAGMAN LOADER				1	1	1	.03
DITCHES	4	21	1		26	26	.66
SNOWBANK		31			31	31	.79
PARKED AIRCRAFT (UNATTENDED)		15	1		16	16	.41
AUTOMOBILE	1	10			11	11	.28
DIRT BANK	5	32			37	37	.94
OTHER	8	61			69	69	1.75
BIRD STRIKE				1	1	1	.03

## ANALYTIC TABLE

FIRST  
TYPE OF ACCIDENTDESTROYED  
SUBSTANTIAL  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STALL	60	75			135	135	3.43
SPIN	102	14			116	116	2.95
SPIRAL	12	4			16	16	.41
MUSH	62	141			203	203	5.16
<u>FIRE OR EXPLOSION</u>							
IN FLIGHT	11	4			15	15	.38
ON GROUND	2	3			5	5	.13
<u>AIRFRAME FAILURE</u>							
IN FLIGHT	43	18			61	61	1.55
ON GROUND	1	10			11	11	.28
ENGINE TEARAWAY							
ENGINE FAILURE OR MALFUNCTION	201	732			933	933	23.72
PROPELLER/ROTOR FAILURE							
PROPELLER	6	21			27	27	.69
TAIL ROTOR							
MAIN ROTOR							
PROP ROTOR ACMDT TO PERSON			2	13	15	15	.38
JET INTAKE/EXH ACMDT TO PERS							
PROPELLER/JET/ROTOR BLAST		4			4	4	.10
TURBULENCE	6	11			17	17	.43
HAIL DAMAGE TO AIRCRAFT		1			1	1	.03
LIGHTNING STRIKE							
EVASIVE MANEUVER		1			1	1	.03
UNCONTROLLED ALT DEVIATION							
DITCHING	2				2	2	.05
MISSING ACFT NOT RECOVERED	11				11	11	.28
MISCELLANEOUS/OTHER	3	5			8	8	.20
UNDETERMINED	7	4			11	11	.28
RECORDS	1022	2877	20	15	3934		
ACCIDENTS	1013	2858	20	15		3888	
PERCENTS	26.0	73.1	.5	.4			

## ANALYTIC TABLE

FIRST PHASE OF OPERATION BY INJURY INDEX  
SMALL FIXED WING

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>STATIC</u>							
STARTING ENGINE/S		1		4	5	5	.13
IDLING ENGINE/S	4	7		3	14	14	.36
ENGINE RUNUP				1	1	1	.03
IDLING ROTORS							
PARKED-ENGINES NOT OPERATING							
OTHER			1		1	1	.03
<u>TAXI</u>							
TO TAKEOFF		1	3	41	45	43	1.14
FROM LANDING	1		3	60	64	63	1.63
OTHER		1	4	22	27	27	.69
GROUND TAXI TO TAKEOFF							
GROUND TAXI FROM LANDING				1	1	1	.03
GROUND TAXI, OTHER							
AERIAL TAXI TO TAKEOFF							
AERIAL TAXI TO/FROM LANDING							
AERIAL TAXI, OTHER							
<u>TAKEOFF</u>							
RUN	3	5	22	189	219	219	5.57
INITIAL CLIMB	78	82	92	267	519	519	13.19
VERTICAL							
RUNNING (ROTORCRAFT/VTOL-STOL)							
ABORTED (FIXED-WING)		2	7	48	57	57	1.45
ABORTED (ROTORCRAFT/VTOL)							
ABORTED (ROTORCRAFT/STOL)							
OTHER		2			2	2	.05
<u>INFLIGHT</u>							
CLIMB TO CRUISE	43	16	23	34	116	116	2.95
NORMAL CRUISE	123	65	92	210	490	486	12.46
DESCENDING	13	10	17	43	83	82	2.11
HOLDING (IFR)							
HOVERING							
POWER-ON DESCENT (ROTORCRAFT)							
AUTOROTATIVE DESCENT							
ACROBATICS	28	2	1	6	37	36	.94
BUZZING	35	7	7	4	53	53	1.35
UNCONTROLLED DESCENT	97	3	5	2	107	107	2.72

## ANALYTIC TABLE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
EMERGENCY DESCENT				1	1	1	.03
LOW PASS	26	12	9	25	72	71	1.83
OTHER	58	11	13	25	107	105	2.72
EN ROUTE TO TREAT CRCP	1		7	7	15	15	.38
EN ROUTE TO RELOADING AREA	2			3	5	5	.13
SURVEY FIELD/AREA			1	2	3	3	.08
STARTING SWATH RUN	2	6	5	13	26	25	.66
SWATH RUN	3	4	6	36	49	49	1.25
FLAREOUT FOR SWATH RUN				1	1	1	.03
PULLUP FROM SWATH RUN	5	7	2	25	39	39	.99
PROCEDURE TURNAROUND	11	13	14	34	72	71	1.83
CLEANUP SWATH		2	3	3	8	8	.20
MANEUVER TO AVOID OBSTRUCTION				1	1	1	.03
RETURN TO STRIP	2		1	6	9	8	.23
<u>LANDING</u>							
TRAFFIC PATTERN-CIRCLING	27	19	14	24	84	82	2.14
FINAL APPROACH (VFR)	32	44	58	147	281	274	7.14
INITIAL APPROACH	6	1	2	1	10	10	.25
FINAL APPROACH (IFR)	16	4	6	4	30	30	.76
LEVEL OFF/TOUCHDOWN	7	19	76	472	574	572	14.59
ROLL (FIXED WING)	2	3	33	499	537	534	13.65
ROLL-ON/RUN-ON (ROTORCRAFT)							
POWER-ON LANDING (ROTORCRAFT)							
POWER-OFF AUTOROTATIVE LDG							
GO-AROUND (VFR)	15	18	25	65	123	123	3.13
MISSED APPROACH (IFR)	7	2	1	1	11	11	.28
OTHER	4	1		2	7	7	.18
UNKNOWN/NOT REPORTED	19	1	2	6	28	28	.71
RECORDS	672	369	555	2338	3934		
ACCIDENTS	656	365	548	2319		3888	
PERCENTS	17.1	9.4	14.1	59.4			

CAUSE/FACTOR TABLE  
SMALL FIXED WING  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 3842 TOTAL ACCIDENTS

INVOLVES 635 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	559 88.03	120 18.90	567 89.29	2571 80.17	294 9.17	2594 80.89	3130 81.47	414 10.78	3161 82.27
PERSONNEL	41 6.46	18 2.83	56 8.82	259 8.08	56 1.75	307 9.57	300 7.81	74 1.93	363 9.45
AIRFRAME	5 .79	12 1.89	17 2.68	14 .44	5 .16	19 .59	19 .49	17 .44	36 .94
LANDING GEAR	1 .16	.00	1 .16	151 4.71	26 .81	175 5.46	152 3.96	26 .68	176 4.58
POWERPLANT	39 6.14	11 1.73	48 7.56	459 14.31	28 .87	483 15.06	498 12.96	39 1.02	531 13.82
SYSTEMS	5 .79	2 .31	7 1.10	37 1.15	19 .59	56 1.75	42 1.09	21 .55	63 1.64
INSTRUMENTS/EQUIPMENT & ACCESSORIES	1 .16	1 .16	2 .31	2 .06	14 .44	16 .50	3 .08	15 .39	18 .47
ROTORCRAFT	.00	.00	.00	.00	.00	.00	.00	.00	.00
AIRPORT/AIRWAYS/FACILITIES	.00	6 .94	6 .94	41 1.28	278 8.67	314 9.79	41 1.07	284 7.39	320 8.33
WEATHER	7 1.10	241 37.95	247 38.90	66 2.06	569 17.74	628 19.58	73 1.90	810 21.08	875 22.77
TERRAIN	9 1.42	82 12.91	91 14.33	284 8.86	509 15.87	791 24.66	293 7.63	591 15.38	882 22.94
MISCELLANEOUS	16 2.52	3 .47	19 2.99	105 3.27	19 .59	122 3.80	121 3.15	22 .57	141 3.67
UNDETERMINED	46 7.24	.00	46 7.24	25 .78	.00	25 .78	71 1.85	.00	71 1.85

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  
SMALL FIXED WING  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 3842 TOTAL ACCIDENTS

INVOLVES 635 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	6	6	12	27	9	36	33	15	48
ATTEMPTED OPERATION BEYOND EXPERIENCE/ABILITY LEVEL	40	16	56	34	14	48	74	30	104
BECAME LOST/DISORIENTED	8	1	9	39	7	46	47	8	55
CONTINUED VFR FLIGHT INTO ADVERSE WEATHER CONDITIONS	102	4	106	50	4	54	152	8	160
CONTINUED INTO KNOWN AREA OF SEVERE TURBULENCE	3		3	3		3	6		6
DELAYED ACTION IN ABORTING TAKEOFF				44	1	45	44	1	45
DELAYED IN INITIATING GO-AROUND	6	2	8	96	12	108	102	14	116
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT	16	1	17	61	20	81	77	21	98
EXCEEDED DESIGN STRESS LIMITS OF AIRCRAFT	29		29	3		3	32		32
FAILED TO EXTEND LANDING GEAR				33		33	33		33
FAILED TO RETRACT LANDING GEAR				7	1	8	7	1	8
RETRACTED GEAR PREMATURELY				4		4	4		4
INADVERTENTLY RETRACTED GEAR				17		17	17		17
FAILED TO SEE AND AVOID OTHER AIRCRAFT	27		27	42	2	44	69	2	71
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS	32		32	98	2	100	130	2	132
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	182		182	353	1	354	535	1	536
MISJUDGED, SPEED, ALTITUDE OR CLEARANCE	3		3	20		20	23		23
FAILED TO USE OR INCORRECTLY USED MISC EQUIPMENT	2		2	3	1	4	5	1	6
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC	12	9	21	41	14	55	53	23	76
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS	10	4	14	84	12	96	94	14	110
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				166	2	168	166	2	168
IMPROPER OPERATION OF FLIGHT CONTROLS	26	2	28	46	5	51	72	7	79
PREMATURE LIFT OFF	4		4	39	2	41	43	2	45
IMPROPER LEVEL OFF	1	1	2	195	3	198	196	4	200
IMPROPER IFR OPERATION	20	1	21	10		10	30	1	31
IMPROPER IN-FLIGHT DECISIONS OR PLANNING	62	7	69	142	8	150	204	15	219
IMPROPER COMPENSATION FOR WIND CONDITIONS		1	1	135	8	143	135	9	144
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING	69	21	90	361	46	407	430	67	497
INADEQUATE SUPERVISION OF FLIGHT	8	1	9	66	5	71	74	6	80
LACK OF FAMILIARITY WITH AIRCRAFT	4	23	27	45	69	114	49	92	141
MISMANAGEMENT OF FUEL	32		32	247		247	279		279
EXERCISED POOR JUDGMENT	28	8	36	43	4	47	71	12	83
OPERATED CARELESSLY	2		2	1	4	5	3	4	7
SELECTED UNSUITABLE TERRAIN	5		5	189	14	203	194	14	208
IMPROPER STARTING PROCEDURES				3		3	3		3
STARTED ENGINE WITHOUT PROPER ASSISTANCE/EQUIPMENT				15	1	16	15	1	16
TAXIED/PARKED WITHOUT PROPER ASSISTANCE				13		13	13		13
FAILED TO ASSURE THE GEAR WAS DOWN AND LOCKED				23		23	23		23
INITIATED FLIGHT IN ADVERSE WEATHER CONDITIONS	31	1	32	21	3	24	52	4	56
CONTROL INTERFERENCE	1		1				1		1
SPONTANEOUS-IMPROPER ACTION				8		8	8		8
MISJUDGED DISTANCE, SPEED, AND ALTITUDE	10	1	11	29	1	30	39	2	41
MISJUDGED DISTANCE AND SPEED	3		3	156	7	163	159	7	166
MISJUDGED DISTANCE	1		1	3		3	4		4
MISJUDGED DISTANCE AND ALTITUDE	5		5	100	2	102	105	2	107
MISJUDGED SPEED AND ALTITUDE				9	2	11	9	2	11
MISJUDGED SPEED				8	2	10	8	2	10
MISJUDGED SPEED AND CLEARANCE	2		2	4		4	6		6
MISJUDGED ALTITUDE AND CLEARANCE	17		17	25		25	42		42
MISJUDGED ALTITUDE	19		19	14		14	33		33
MISJUDGED CLEARANCE	12		12	72		72	84		84
INADEQUATE TRAINING OF STUDENT				2		2	2		2
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS				3	1	4	3	1	4
IMPROPER RECOVERY FROM BOUNCED LANDING		1	1	111	4	115	111	5	116
INCAPACITATION	9		9	2		2	11		11
PHYSICAL IMPAIRMENT	23	21	44	4	3	7	27	24	51
SPATIAL DISORIENTATION	93		93	12		12	105		105
PSYCHOLOGICAL CONDITION	1		1				1		1
MISUSED OR FAILED TO USE FLAPS	5	4	9	26	14	40	31	18	49
					1	1		1	1
FAILED TO MAINTAIN DIRECTIONAL CONTROL	1		1	273		273	274		274
SELECTED WRONG RUNWAY RELATIVE TO EXISTING WIND	2	2	4	52	8	60	54	10	64

# CAUSE/FACTOR TABLE

## FAILED TO ABORT TAKEOFF (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
FAILED TO ABORT TAKEOFF	7		7	58	4	62	65	4	69
FAILED TO INITIATE GO-AROUND	3		3	131	9	140	134	9	143
DIRECT ENTRIES	1		1				1		1
SUBTOTAL	985	138	1123	3921	334	4255	4906	472	5378
COPILOT									
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	1		1				1		1
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				2		2	2		2
IMPROPER OPERATION OF FLIGHT CONTROLS	1		1				1		1
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING				1		1	1		1
LACK OF FAMILIARITY WITH AIRCRAFT	1	1	2				1	1	2
MISMANAGEMENT OF FUEL				1		1	1		1
FAILURE TO RELINQUISH CONTROL	1		1				1		1
CONTROL INTERFERENCE				1		1	1		1
SPONTANEOUS-IMPROPER ACTION				1		1	1		1
MISJUDGED DISTANCE AND ALTITUDE				2		2	2		2
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS				1		1	1		1
PHYSICAL IMPAIRMENT	1	1	2				1	1	2
SUBTOTAL	5	2	7	9		9	14	2	16
DUAL STUDENT									
CONTINUED VFR FLIGHT INTO ADVERSE WEATHER CONDITIONS				1		1	1		1
DELAYED ACTION IN ABORTING TAKEOFF				1		1	1		1
DELAYED IN INITIATING GO-AROUND				1		1	1		1
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT				1		1	1		1
FAILED TO EXTEND LANDING GEAR				1		1	1		1
INADVERTENTLY RETRACTED GEAR				2		2	2		2
FAILED TO SEE OTHER AIRCRAFT				1		1	1		1
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS				1		1	1		1
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	4		4	6		6	10		10
MISJUDGED DISTANCE, SPEED, ALTITUDE OR CLEARANCE				1		1	1		1
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				1		1	1		1
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				5		5	5		5
IMPROPER OPERATION OF FLIGHT CONTROLS				8		8	8		8
PREMATURE LIFT-OFF				1		1	1		1
IMPROPER LEVEL OFF				9		9	9		9
IMPROPER IN-FLIGHT DECISIONS OR PLANNING				1		1	1		1
IMPROPER COMPENSATION FOR WIND CONDITIONS				5		5	5		5
LACK OF FAMILIARITY WITH AIRCRAFT					1	1		1	1
SELECTED UNSUITABLE TERRAIN				1		1	1		1
FAILURE TO RELINQUISH CONTROL				5		5	5		5
CONTROL INTERFERENCE				3		3	3		3
SPONTANEOUS-IMPROPER ACTION				3		3	3		3
MISJUDGED DISTANCE AND SPEED				3		3	3		3
MISJUDGED DISTANCE AND ALTITUDE	1		1	10		10	11		11
MISJUDGED SPEED AND ALTITUDE				1		1	1		1
MISJUDGED CLEARANCE				1		1	1		1
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS				2		2	2		2
IMPROPER RECOVERY FROM BOUNCED LANDING	1		1	1		1	2		2
SPATIAL DISORIENTATION	1		1				1		1
MISUSED OR FAILED TO USE FLAPS				2		2	2		2
FAILED TO MAINTAIN DIRECTIONAL CONTROL				9		9	9		9
FAILED TO ABORT TAKEOFF				1		1	1		1
FAILED TO INITIATE GO-AROUND				3		3	3		3
SUBTOTAL	7		7	91	1	92	98	1	99
CHECK PILOT									
INADEQUATE SUPERVISION OF FLIGHT				1	1	2	1	1	2
SUBTOTAL				1	1	2	1	1	2
** PERSONNEL **									
FLIGHT INSTRUCTOR									
INADEQUATE SUPERVISION OF FLIGHT		2	2	13	1	14	13	3	16
INADEQUATE TRAINING OF STUDENT				2	5	7	2	5	7
MAINTENANCE, SERVICING, INSPECTION									
IMPROPER MAINTENANCE(MAINTENANCE PERSONNEL)	4		4	39	2	41	43	2	45
IMPROPER MAINTENANCE(OWNER PERSONNEL)	1	1	2	14	1	15	15	2	17
IMPROPERLY SERVICED AIRCRAFT(GROUND CREW)		1	1	1	3	4	1	4	5
IMPROPERLY SERVICED AIRCRAFT(OWNER-PILOT)				4		4	4		4
INADEQUATE INSPECTION OF AIRCRAFT(MAINTENANCE PERSONNEL)	4		4	12	1	13	16	1	17
INADEQUATE INSPECTION OF ACFT(OWNER-PILOT PERSONNEL)		1	1	5	3	8	5	4	9

CAUSE/FACTOR TABLE

PERSONNEL (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
INADEQUATE MAINTENANCE AND INSPECTION	8	2	10	77	18	95	85	20	105
OTHER				3		3	3		3
UNK/NR				1		1	1		1
OPERATIONAL SUPERVISORY PERSONNEL									
INADEQUATE SUPERVISION OF FLIGHT CREW		1	1	2		2	2	1	3
INADEQUATE SUPERVISION/TRAINING OF RAMP CREWS				1	1	2	1	1	2
FAILURE TO PROVIDE ADEQ DIRECTIVES, MANUALS, EQUIPMENT				2	1	3	2	1	3
DEFICIENCY, COMPANY MAINTAINED EOMT, SERV. REGULATIONS		1	1	4	3	7	4	4	8
WEATHER PERSONNEL									
INCORRECT WEATHER FORECAST	1	3	4				1	3	4
TRAFFIC CONTROL PERSONNEL									
FAILURE OR DELAY IN INITIATING EMERGENCY PROCEDURES					1	1		1	1
FAILURE TO ADVISE OF UNSAFE WEATHER CONDITION		1	1					1	1
FAILURE TO ADVISE OF OTHER TRAFFIC					2	2		2	2
ISSUED IMPROPER OR CONFLICTING INSTRUCTIONS		1	1	3		3	3	1	4
INADEQUATE SPACING OF AIRCRAFT					2	2		2	2
OTHER				2	1	3	2	1	3
AIRPORT SUPERVISORY PERSONNEL									
IMPROPER MAINTENANCE-AIRPORT FACILITIES				1		1	1		1
FAILURE TO NOTIFY OF UNSAFE COND/AND OR FAILURE TO MARK				3	3	6	3	3	6
IMPROPER/INADEQUATE SNOW REMOVAL				7	5	12	7	5	12
IMPROPER INSPECTION OF FACILITIES				1		1	1		1
OTHER		1	1	1		1	1	1	2
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
SUBSTANDARD QUALITY CONTROL				1		1	1		1
POOR/INADEQUATE DESIGN	2	1	3	8	1	9	10	2	12
OTHER				2		2	2		2
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT	29		29	47	2	49	76	2	78
GROUND SIGNALMAN				2		2	2		2
SPECTATOR				1		1	1		1
GROUND CREWMAN				1		1	1		1
PASSENGER	5		5	13	2	15	18	2	20
DRIVER OF VEHICLE		1	1	9		9	9	1	10
OTHER		2	2	1	1	2	1	3	4
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL	54	19	73	283	59	342	337	78	415
** AIRFRAME **									
WINGS									
SPARS		4	4					4	4
WING ATTACHMENT FITTINGS, BOLTS		1	1	1		1	1	1	2
BRACING WIRES, STRUTS				1		1	1		1
SKIN AND ATTACHMENTS	1	2	3				1	2	3
WINGTIPS				1		1	1		1
OTHER		2	2					2	2
FUSELAGE									
SKIN AND ATTACHMENTS				1	1	2	1	1	2
DOORS, DOOR FRAMES	1		1	2	2	4	3	2	5
WINDSHIELDS, WINDOWS, CANOPIES				1	1	1		1	1
SEATS				1		1	1		1
OTHER		2	2		1	1		3	3
LANDING GEAR									
MAIN GEAR-SHOCK ABSORBING ASSY, STRUTS, ATTACHMENTS, ETC				31		31	31		31
NORMAL RETRACTION/EXTENSION ASSEMBLY				24	4	28	24	4	28
EMERGENCY/EXTENSION ASSEMBLY				7		7	7		7
TAILWHEEL ASSEMBLIES	1		1	4	2	6	5	2	7
NOSEWHEEL ASSEMBLIES				13		13	13		13
WHEELS, TIRES, AXLES				15	8	23	15	8	23
SKI ASSEMBLIES				1		1	1		1
FLOAT ASSEMBLIES				1		1	1		1
BRAKING SYSTEM (NORMAL)				40	5	45	40	5	45
LANDING GEAR WARNING AND INDICATING COMPONENTS				16	7	23	16	7	23
GEAR LOCKING MECHANISM				3		3	3		3
SWITCHES, LEVERS, CRANKING MECHANISM, ETC				4		4	4		4
NOSEWHEEL STEERING				3	2	5	3	2	5
OTHER									
FLIGHT CONTROL SURFACES									
ELEVATOR, ASSEMBLY ATTACHMENTS	2	2	4	1		1	3	2	5
RUDDER, SURFACES ATTACHMENTS				2		2	2		2

## CAUSE/FACTOR TABLE

## AIRFRAME (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
AILERON, SURFACES ATTACHMENTS	1		1	2		2	3		3
HORIZONTAL STABILIZER, ATTACHMENTS		2	2					2	2
VERTICAL STABILIZER, ATTACHMENTS	1		1				1		1
FLAP ASSEMBLIES				1		1	1		1
OTHER		2	2	1		1	1	2	3
SUBTOTAL	7	17	24	176	33	209	183	50	233
** POWERPLANT **									
ENGINE STRUCTURE									
CRANKSHAFT	3		3	16		16	19		19
MASTER AND CONNECTING RODS	2		2	28		28	30		30
CYLINDER ASSEMBLY				18	1	19	18	1	19
PISTON, PISTON RINGS	2	1	3	10		10	12	1	13
VALVE ASSEMBLIES	1	1	2	27		27	28	1	29
BLOWER, IMPELLER ASSEMBLY				9		9	9		9
OTHER				8		8	8		8
IGNITION SYSTEM									
MAGNETOES	3		3	19	1	20	22	1	23
SPARK PLUG	2	1	3	11	2	13	13	3	16
COILS				1		1	1		1
IGNITION HARNESS, SHIELDING				2		2	2		2
SWITCHES				1	1	2	1	1	2
LEADS				2		2	2		2
FUEL SYSTEM									
TANKS				5	1	6	5	1	6
LINE AND FITTINGS	2		2	13		13	15		15
SELECTOR VALVES		1	1	3	1	4	3	2	5
FILTERS, STRAINERS, SCREENS	2		2	2		2	4		4
PRIMING SYSTEM				1		1	1		1
CARBURETOR				13		13	13		13
PUMPS	1		1	8	1	9	9	1	10
FUEL INJECTION SYSTEM	1		1	6		6	7		7
VENTS, DRAINS, TANK CAPS				13	3	16	13	3	16
RAM AIR ASSEMBLY				4		4	4		4
OTHER	1		1	7	2	9	8	2	10
LUBRICATING SYSTEM									
LINE, HOSES, FITTINGS	2	2	4	14		14	16	2	18
VALVES				2		2	2		2
FILTERS, SCREENS	1		1				1		1
PUMP-PRESSURE				2		2	2		2
PUMPS-SCAVENGER				1		1	1		1
SEALS AND GASKETS				3		3	3		3
OTHER				3		3	3		3
COOLING SYSTEM									
COWLING				1		1	1		1
PROPELLER AND ACCESSORIES									
BLADES	1		1	12	1	13	13	1	14
HUBS				4		4	4		4
HYDRAULIC PITCH CONTROL MECHANISM				3		3	3		3
COUNTERWEIGHT				1		1	1		1
GOVERNORS				2		2	2		2
BLADE RETENTION MECHANISM				1		1	1		1
PLANETARY GEAR				1		1	1		1
OTHER	1	2	3	3		3	4	2	6
EXHAUST SYSTEM									
MANIFOLDS	1		1				1		1
MUFFLERS	1		1	2		2	3		3
STACKS				2		2	2		2
BAFFLES				1		1	1		1
EXTERNAL SUPERCHARGER				1		1	1		1
OTHER				1		1	1		1
ENGINE ACCESSORIES									
VACUUM PUMPS	1		1	1		1	2		2
GENERATORS				1	2	3	1	2	3
STARTERS				1		1	1		1
ENGINE CONTROLS									
THROTTLE-POWER LEVER ASSEMBLIES				14		14	14		14
MIXTURE CONTROL ASSEMBLIES				5	1	6	5	1	6
INDUCTION AIR, PREHEAT CONTROLS				2		2	2		2
PROPELLER GOVERNOR CONTROLS					1	1		1	1
POWERPLANT-INSTRUMENTS									
FUEL QUANTITY GAUGE		2	2		12	12		14	14
MISCELLANEOUS									
POWERPLANT FAILURE FOR UNDETERMINED REASONS	13	1	14	159		159	172	1	173

## CAUSE/FACTOR TABLE

## POWERPLANT (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
BIRD INGESTION	1		1	2		2	3		3
FOREIGN OBJECT DAMAGE				1		1	1		1
REDUCTION GEAR ASSEMBLY									
GEARS, REDUCTION				1		1	1		1
GEARS, ACCESSORY DRIVE				4		4	4		4
COMPRESSOR ASSEMBLY									
COMBUSTION ASSEMBLY									
TURBINE ASSEMBLY									
ACCESSORY DRIVE ASSEMBLY									
LUBRICATING SYSTEM									
TUBING	1		1				1		1
OTHER				1		1	1		1
FUEL SYSTEM									
SAFETY SYSTEM									
IGNITION SYSTEM									
TORQUEMETER									
AIR BLEED									
EXHAUST SYSTEM									
THRUST REVERSER									
PROPELLER SYSTEM									
PITCH CHANGING MECHANISM				1		1	1		1
CONSTANT SPEED DRIVE									
POWER LEVER									
PROPELLER LEVER									
REVERSE THRUST LEVER									
ENGINE INDICATING EQUIPMENT									
ENGINE INSTALLATION									
SUBTOTAL	43	11	54	480	30	510	523	41	564
** SYSTEMS **									
ELECTRICAL SYSTEM									
BATTERIES				2		2	2		2
GENERATORS/ALTERNATORS		1	1		6	6		7	7
REGULATOR		1	1					1	1
RELAYS AND WIRING				1	2	3	1	2	3
MOTORS				1		1	1		1
SWITCHES					1	1		1	1
PROTECTIVE DEVICES					1	1		1	1
OTHER				3	2	5	3	2	5
HYDRAULIC SYSTEM									
RESERVOIR, LINES, FITTINGS				3	2	5	3	2	5
SEALS				4		4	4		4
BY-PASS VALVE				1		1	1		1
OTHER				3	1	4	3	1	4
FLIGHT CONTROL SYSTEMS									
AILERON AND AILERON TAB CONTROL SYSTEM				6	1	7	6	1	7
ELEVATOR AND ELEVATOR TAB CONTROL SYSTEM	3		3	5		5	8		8
RUDDER AND RUDDER TAB CONTROL SYSTEM				5	2	7	5	2	7
WING FLAP CONTROL SYSTEM (ELECTRICAL)				1	2	3	1	2	3
WING FLAP CONTROL SYSTEM (MECHANICAL)				1		1	1		1
OTHER	1		1				1		1
ANTI-ICING, DE-ICING SYSTEMS									
CARBURETOR DE-ICING SYSTEM				3		3	3		3
AIR CONDITION, HEATING AND PRESSURIZATION									
OTHER	1		1				1		1
AUTO PILOT									
FIRE WARNING SYSTEM									
FIRE EXTINGUISHER SYSTEM									
OXYGEN SYSTEM									
OTHER SYSTEMS									
SUBTOTAL	5	2	7	39	20	59	44	22	66
** INSTRUMENTS/EQUIPMENT AND ACCESSORIES **									
FLIGHT AND NAVIGATION INSTRUMENTS									
AIRSPEED					4	4		4	4
ATTITUDE GYRO		1	1					1	1
OTHER					1	1		1	1
COMMUNICATIONS AND NAVIGATION EQUIPMENT									
TRANSMITTERS AND/OR RECEIVERS	1		1		1	1	1	1	2
ILS RECEIVERS					1	1		1	1
VOR RECEIVERS					2	2		2	2
MISCELLANEOUS EQUIPMENT									

## CAUSE/FACTOR TABLE

## INSTRUMENTS/EQUIPMENT AND ACCESSORIES (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
SPRAY, DUSTING EQUIPMENT				2	5	7		5	7
SUBTOTAL	1	1	2	2	14	16	3	15	18
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
INSTRUMENT LANDING SYSTEM		1	1					1	1
APPROACH LIGHTING		1	1		1	1		2	2
RUNWAY LIGHTING		1	1	3	15	18	3	16	19
TAXIWAY LIGHTING AND MARKING					2	2		2	2
OTHER		1	1	1	6	7	1	7	8
AIRPORT CONDITIONS									
WET RUNWAY		1	1	6	47	53	6	48	54
ICE/SLUSH ON RUNWAY				2	17	19	2	17	19
SNOW ON RUNWAY		1	1	6	47	53	6	48	54
SNOW WINDROWS		1	1	2	33	35	2	34	36
UNMARKED OBSTRUCTIONS				1	3	4	1	3	4
SOFT SHOULDERS (RUNWAY)					15	15		15	15
ROUGH WATER					1	1		1	1
HIGH VEGETATION	3	3		1	12	13	1	15	16
HIDDEN HAZARD				4	5	9	4	5	9
POORLY MAINTAINED RUNWAY SURFACE				7	18	25	7	18	25
SOFT RUNWAY				5	22	27	5	22	27
ICE/SLUSH ON RAMP/TAXIWAY					3	3		3	3
SNOW ON RAMP/TAXIWAY					2	2		2	2
SOFT SHOULDERS (RAMP/TAXIWAY)				1	1	2	1	1	2
POORLY MAINTAINED RAMP/TAXIWAY SURFACE				1	1	2	1	1	2
SOFT TAXIWAY				1	1	1	1	1	1
OTHER				8	58	66	8	58	66
AIRWAYS FACILITIES									
SUBTOTAL		10	10	49	309	358	49	319	368
** WEATHER **									
LOW CEILING	2	132	134		54	54	2	186	188
RAIN		46	46		40	40		86	86
FOG	2	93	95		61	61	2	154	156
SNOW		22	22		11	11		33	33
HAIL		1	1	1	1	2	1	2	3
ICING CONDITIONS-INCLUDES SLEET, FREEZING RAIN, ETC	1	13	14		16	16	1	29	30
CONDITIONS CONDUCTIVE TO CARB/INDUCTION SYSTEM ICING		7	7		52	52		59	59
UNFAVORABLE WIND CONDITIONS		9	9	29	244	273	29	253	282
WIND SHEAR		3	3	4	3	7	4	6	10
SUDDEN WINDSHIFT				11	19	30	11	19	30
TURBULENCE IN FLIGHT, CLEAR AIR	1	3	4		5	5	1	8	9
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS	1	13	14	1	11	12	2	24	26
DOWNDRAFTS, UPDRAFTS	1	13	14	12	45	57	13	58	71
LOCAL WHIRLWIND				9		9	9		9
TORNADO		1	1					1	1
SQUALL LINE		1	1					1	1
ADVERSE WINDS ALOFT				1	2	3	1	2	3
HIGH TEMPERATURE		4	4		22	22		26	26
OBSTRUCTIONS TO VISION		11	11		5	5		16	16
HIGH DENSITY ALTITUDE		20	20		65	65		85	85
THUNDERSTORM ACTIVITY		23	23	2	20	22	2	43	45
OTHER		3	3		2	2		5	5
SUBTOTAL	8	418	426	70	678	748	78	1096	1174
** TERRAIN **									
WET, SOFT GROUND				45	58	103	45	58	103
SNOW-COVERED		1	1	12	23	35	12	24	36
ICY					2	2		2	2
HIGH VEGETATION		1	1	31	40	71	31	41	72
HIDDEN OBSTRUCTIONS				14	7	21	14	7	21
ROUGH/UNEVEN	2	3	5	106	121	227	108	124	232
ROUGH WATER				1	5	6	1	5	6
GLASSY WATER					3	3		3	3
HIGH OBSTRUCTIONS	7	73	80	74	226	300	81	299	380
LOOSE GRAVEL		1	1		6	6		7	7
SANDY		1	1	2	5	7	2	6	8
OTHER		4	4	12	32	44	12	36	48
SURTOTAL	9	84	93	297	528	825	306	612	918

## CAUSE/FACTOR TABLE

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
** MISCELLANEOUS **									
SUICIDE	1		1				1		1
FOREIGN OBJECT DAMAGE				5		5	5		5
SMOKE IN COCKPIT	1		1	1	5	6	2	5	7
FOREIGN MATERIAL AFFECTING NORMAL OPERATIONS	3		3	18	2	20	21	2	23
UNDETERMINED	46		46	25		25	71		71
BIRD COLLISION				2		2	2		2
VORTEX TURBULENCE	1		1	7	1	8	8	1	9
PROP/JET/ROTOR BLAST				5		5	5		5
ANIMAL(S) ON RUNWAY/TAXIWAY/RAMP				11		11	11		11
EVASIVE MANEUVER TO AVOID COLLISION	6	3	9	44	8	52	50	11	61
UNQUALIFIED PERSON OPERATED AIRCRAFT	3		3	11	3	14	14	3	17
DIRECT ENTRIES	1		1	3		3	4		4
SUBTOTAL	62	3	65	132	19	151	194	22	216
GRAND TOTAL	1186	705	1891	5550	2026	7576	6736	2731	9467
** MISCELLANEOUS ACTS, CONDITIONS **									
FIRE OF UNDETERMINED ORIGIN		2	2		4	4		6	6
UNAPPROVED MODIFICATION		1	1	1	3	4	1	4	5
IMPROPER/INADEQUATE VENTING				5		5	5		5
ACTION, LACK OF				1		1	1		1
POOR WELD				2		2	2		2
PREVIOUS DAMAGE				15	8	23	15	8	23
BRAKES FROZEN				1	1	2	1	1	2
LEAK/LEAKAGE	4	2	6	15	5	20	19	7	26
LOW FLUID LEVEL				2		2	2		2
CIRCUIT BREAKER POPPED				1	4	5	1	4	5
ARCING				1		1	1		1
LOW COMPRESSION		2	2	11	1	12	11	3	14
RUNWAY CLOSED				2	6	8	2	6	8
DOWNDOWN		6	6	2	89	91	2	95	97
CARBON DEPOSITS				4	2	6	4	2	6
LANDED IN CONSTRUCTION AREA				4	2	6	4	2	6
OVER TORQUED				1	1	2	1	1	2
UNDER TORQUED				1		1	1		1
LOOSE, PART/FITTING	1		1	14	3	17	15	3	18
BENT	1		1				1		1
BINDING				3	1	4	3	1	4
RUST				2		2	2		2
BURNED				1		1	1		1
CHAFED				3		3	3		3
CHIPPED	1		1				1		1
COLLAPSED				1	1	2	1	1	2
CROSSED				2	2	4	2	2	4
DETERIORATED				3	3	6	3	3	6
DISCONNECTED				19	1	20	19	1	20
DISTORTED				1		1	1		1
ELONGATED				1		1	1		1
EXCESSIVE-WEAR/PLAY				6	2	8	6	2	8
ERRATIC		1	1	1	13	14	1	14	15
FLUCTUATING					1	1		1	1
FLUTTER	3		3	1		1	4		4
FRAYED				2		2	2		2
GROUNDED	1		1	6		6	7		7
IMPROPERLY INSTALLED				19	1	20	19	1	20
JAMMED	2		2	7	2	9	9	2	11
NICKED				1		1	1		1
OBSTRUCTED	4		4	22		22	26		26
OPEN				1	1	1		1	1
OUT OF BALANCE				1		1	1		1
OVERHEATED				4		4	4		4
EXCESSIVE PRESSURE	1		1				1		1
PRESSURE TOO LOW				4	4	8	4	4	8
PRESSURE, NONE				7	1	8		1	8
SCORED	1		1	2		2	3		3
SHEARED				2		2	2		2
STICKING				1		1	1		1
STUCK		1	1	4	2	6	4	3	7
EXCESSIVE TEMPERATURE	1		1				1		1
VIBRATION, EXCESSIVE				4	2	6	4	2	6
ICE-INDUCTION				1		1	1		1
FIRE IN WING	1		1		3	3	1	5	6
LOAD NOT JETTISONED		2	2	5	4	9	5	6	11

## CAUSE/FACTOR TABLE

## MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
INTENTIONAL GROUND-WATER LOOP-SWERVE				16	7	23	16	7	23
INTENTIONAL WHEELS UP				15	9	24	15	9	24
RAN OFF END OF RUNWAY					114	114		114	114
ALTITUDE SETTING-INCORRECT	1		1	1	2	3	2	2	4
ANTI-ICING/DEICING EQUIP-IMPROPER OPER. OF/FAILED TO USE	5		5	46		46	51		51
CHECKLIST-FAILED TO USE		1	1		19	19		20	20
CREW COORDINATION-POOR				1	1	2	1	1	2
DISREGARD OF GOOD OPERATING PRACTICE	2	5	7	4	8	12	6	13	19
IMPROPER EMERGENCY PROCEDURES	4	3	7	12	7	19	16	10	26
FEATHERED WRONG ENGINE	1		1				1		1
GUST LOCKS ENGAGED				1		1	1		1
INSTRUCTIONS-MISINTERPRETED					1	1		1	1
INSTRUMENTS-MISREAD OR FAILED TO READ	2	2	4	5	1	6	7	3	10
SEAT BELT NOT FASTENED		4	4					4	4
NOT ALLIGNED WITH RUNWAY/INTENDED LANDING AREA	2	1	3	18	10	28	20	11	31
UNWARRANTED LOW FLYING	37	34	71	34	27	61	71	61	132
FAILED TO EXTEND THE LANDING FLAPS					1	1		1	1
FAILED TO USE ALL AVAILABLE RUNWAY		1	1	2	6	8	2	7	9
LANDED AT WRONG AIRPORT				1	1	2	1	1	2
INATTENTIVE TO FUEL SUPPLY	5		5	39	4	43	44	4	48
FLEW INTO BLIND CANYON	9	3	12	10	1	11	19	4	23
PREMATURE FLAP RETRACTION				2	3	5	2	3	5
POORLY PLANNED APPROACH	2	5	7	14	41	55	16	46	62
MISCALCULATED FUEL CONSUMPTION	1	1	2	16	6	22	17	7	24
JETTISONED LOAD					26	26		26	26
STOLEN OR UNAUTHORIZED USE OF AIRCRAFT		6	6		18	18		24	24
IMPROPERLY SECURED	1		1	11	4	15	12	4	16
ROGUS PART				1		1	1		1
COMMUNICATIONS FAILURE		1	1					1	1
ELECTRICAL FAILURE		1	1	2	12	14	2	13	15
ENGINE LOADED UP				7	2	9	7	2	9
FATIGUE FRACTURE	7	1	8	18		18	25	1	26
FUEL GRADE-IMPROPER		1	1	5		5	5	1	6
HYDRAULIC FAILURE				7	1	8	7	1	8
RPM-UNCONTROLLABLE-OVERSPEED				2	1	3	2	1	3
THRUST REVERSAL-ASYMETRICAL					1	1		1	1
WINDSHIELD, DIRTY, FOGGY, ETC-RESTRICTED VISION		1	1	2	5	7	2	6	8
WRONG PART	1	1	2	7		7	8	1	9
IMPROPER ALIGNMENT/ADJUSTMENT	1		1	17	2	19	18	2	20
FAILURE OF TWO OR MORE ENGINES	1	3	4	2	11	13	3	14	17
SEPARATION IN FLIGHT		33	33	2	15	17	2	48	50
FIRE IN CABIN/ COCKPIT/ BAGGAGE COMPARTMENT	1		1	1	2	3	2	2	4
FIRE IN ENGINE	1		1	7	8	15	8	8	16
FIRE IN BRAKES/ WHEEL ASSEMBLY/ WHEEL WELL	1	2	3				1	2	3
ASYMETRICAL FLAPS				1		1	1		1
LATERAL IMBALANCE				1		1	1		1
CORRODED/CORROSION				6	1	7	6	1	7
INCORRECT TRIM SETTING					3	3		3	3
CARGO SHIFTED	1		1	2		2	3		3
CONGESTED TRAFFIC-PATTERN		2	2		6	6		8	8
PILOT FATIGUE	2	11	13	2	14	16	4	25	29
FUEL EXHAUSTION	18		18	198		198	216		216
FUEL CONTAMINATION-EXCLUSIVE OF WATER IN FUEL				16	1	17	16	1	17
PILOT SUFFERED HEART ATTACK	2		2				2		2
ALCOHOLIC IMPAIRMENT OF EFFICIENCY AND JUDGMENT	25	16	41	2	4	6	27	20	47
CARBON MONOXIDE POISONING	1		1				1		1
ICE-IN FUEL	2		2	6		6	8		8
ICE-CARRIAGE/RETOR	5		5	49		49	54		54
ICE-PROPELLER				1		1	1		1
AIRFRAME ICE	4	3	7	19	8	27	23	11	34
ICE-WINDSHIELD		2	2	3	4	7	3	6	9
IMPROPERLY LOADED AIRCRAFT-WEIGHT-AND/OR CG	5	12	17	12	13	25	17	25	42
INTERFERENCE WITH FLIGHT CONTROLS	3		3	8	2	10	11	2	13
WHITEOUT		1	1	1	5	6	1	6	7
SINGLARE		3	3	1	12	13	1	15	16
LACK OF LUBRICATION-SPECIFIC PART, NOT SYSTEM	1		1	1	2	3	2	2	4
OIL EXHAUSTION-ENGINE LUBRICATION SYSTEM	1	1	2	25		25	26	1	27
SIMULATED CONDITIONS		4	4	1	26	27	1	30	31
FUEL SIPHONING				2		2	2		2
WATER IN FUEL	7	1	8	45		45	52	1	53
AIRCRAFT CAME TO REST IN WATER		34	34		68	68		102	102
FROZEN, MOISTURE				5	1	6	5	1	6
MISSING		1	1	12		12	12	1	13
TOUCH AND GO LANDING		3	3		72	72		75	75
HYDROPLANING ON WET RUNWAY				4	7	11	4	7	11
OVERLOAD FAILURE	4	25	29	9	363	372	13	388	401



# CAUSE/FACTOR TABLE

MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)(CONTINU

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
MATERIAL FAILURE	12	1	13	199	7	206	211	8	219
FUEL STARVATION	20		20	138		138	158		158
OIL STARVATION				9		9	9		9
IMPROPER CLEARANCE-TOLFRANCE	1		1	7	1	8	8	1	9
FUEL SELECTOR POSITIONED BETWEEN TANKS	1		1	1	1	2	2	1	3

## DIRECT ENTRY CAUSES

MISC - FUEL STARVATION FOR UNDETERMINED REASON  
MISC - FLT SUIT SLEEVE CAUGHT & CLOSED THROTTLE  
MISC-PREMATURE CHUTE OPENING  
PILOT-FAILED TO MAINTAIN POSITIVE RATE-OF-CLIMB  
MISC-PREMATURE CHUTE OPENING

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

## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
SMALL FIXED WINGKIND OF FLYINGFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

INSTRUCTIONAL

DUAL	23	26	30	121	200	198	5.08
SOLO	10	4	33	144	191	191	4.86
CHECK	3		1	8	12	12	.31
TRAINING	9	8	11	93	121	121	3.08

NONCOMMERCIAL

PLEASURE	418	189	316	1125	2048	2035	52.06
PRACTICE	17	12	16	102	147	147	3.74
BUSINESS	51	24	28	182	285	285	7.24
CORPORATE/EXECUTIVE	13	3	6	23	45	45	1.14
AERIAL SURVEY	4	3	2	5	14	14	.36
COMPANY FLIGHT							
OTHER	2	1	1	2	6	6	.15

COMMERCIAL

AERIAL APPLICATION	21	32	31	118	202	199	5.13
CROP CONTROL RELATED FLIGHT	8	11	14	150	183	182	4.65
FIRE CONTROL				1	1	1	.03
FIRE CONTROL RELATED FLIGHT							
AERIAL MAPPING/PHOTOGRAPHY	1		1	4	6	6	.15
AERIAL ADVERTISING	1	2	2	7	12	12	.31
POWER AND PIPELINE PATROL	3	1		2	6	6	.15
FISH SPOTTING	2			4	6	6	.15
AIR TAXI-PASSENGER OPERATIONS	17	12	9	66	104	104	2.64
AIR TAXI-CARGO OPERATIONS	16	8	13	35	72	72	1.83
CONSTRUCTION WORK							
SCHEDULED PASSENGER SERVICE							
SCHEDULED CARGO SERVICE	1				1	1	.03
INTRA-STATE CHARTER PASSG.				1	1	1	.03
INTRA-STATE CHARTER CARGO.							
MILITARY CONTRACT-PASSENGER							
MILITARY CONTRACT-CARGO							
CHARTER CARGO-DOMESTIC		1		1	2	2	.05
CHARTER PASSG-DOMESTIC	2			2	4	4	.10
CHARTER-CARGO-INTERNATIONAL							
CHARTER-PASSG-INTERNATIONAL	1			1	2	2	.05
OTHER	4	2	4	4	14	13	.36
UNKNOWN/NOT REPORTED							

## ANALYTIC TABLE

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>MISCELLANEOUS</u>							
EXPERIMENTATION	2			3	5	5	.13
TEST	7	8	11	18	44	44	1.12
DEMONSTRATION	6	3	2	9	20	20	.51
FERRY	8	8	12	62	90	89	2.29
SEARCH AND RESCUE	3	1		1	5	5	.13
AIR SHOW/AIR RACING	5		2	3	10	9	.25
PARACHUTE JUMP	3	3	5	7	18	18	.46
PARACHUTE JUMP-AIR SHOW							
TOWING GLIDERS		2	2	10	14	14	.36
SEEDING CLOUDS							
HUNTING				4	4	4	.10
POLICE PATROL							
HIGHWAY TRAFFIC ADVISORY							
ALL OTHER PUBLIC FLYING	1			1	2	2	.05
OTHER	4	5	2	8	19	19	.48
UNKNOWN/NOT REPORTED	6		1	11	18	18	.46
RECORDS	672	369	555	2338	3934		
ACCIDENTS	656	365	548	2319		3888	
PERCENTS	17.1	9.4	14.1	59.4			

INJURIES, ACCIDENTS  
SMALL FIXED WING

INJURIES						
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	600	353	522	2459		3934
COPILOT	38	14	13	41		106
DUAL STUDENT	23	19	33	147		222
CHECK PILOT			1	4		5
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT				5		5
EXTRA CREW	3	2	3	8		16
PASSENGERS	633	290	409	2180		3512
TOTAL	1297	678	981	4844	ABOARD	7800
* OTHER AIRCRAFT	3			5		8
OTHER GROUND	10	5	17	6		38
GRAND TOTAL	1310	683	998	4855		7846

INVOLVES 3888 TOTAL ACCIDENTS  
INVOLVES 656 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



**GENERAL AVIATION ACCIDENTS**

**LARGE FIXED-WING AIRCRAFT**



## ANALYTIC TABLE

FIRST TYPE OF ACCIDENT BY AIRCRAFT DAMAGE  
LARGE FIXED WING

FIRST TYPE OF ACCIDENT	AIRCRAFT DAMAGE			RECORDS	ACCIDENTS	PERCENT
	DESTROYED	SUBSTANTIAL	MINOR NONE			
GROUND-WATER LOOP-SWERVE	3			3	3	7.89
DROGGED WINGTIP POD OR FLOAT						
WHEELS-UP LANDING	2			2	2	5.26
WHEELS-DOWN LANDING IN WATER						
GEAR COLLAPSED	1			1	1	2.63
GEAR RETRACTED	1			1	1	2.63
HARD LANDING	1	1		2	2	5.26
NOSE OVER/DOWN	2			2	2	5.26
ROLL OVER						
OVERSHOOT	2	1		3	3	7.89
UNDERSHOOT						
<u>COLLISION BETWEEN AIRCRAFT</u>						
BOTH IN FLIGHT	1			1	1	2.63
ONE AIRBORNE						
BOTH ON GROUND						
<u>COLLISION WITH GROUND/WATER</u>						
CONTROLLED	3			3	3	7.89
UNCONTROLLED	2			2	2	5.26
<u>COLLIDED WITH</u>						
WIRES/POLES						
TREES	1			1	1	2.63
RESIDENCE/S						
BUILDING/S	1			1	1	2.63
FENCE, FENCEPOSTS						
ELECTRONIC TOWERS						
RUNWAY OR APPROACH LIGHTS						
AIRPORT HAZARD						
ANIMALS						
CROP						
FLAGMAN LOADER						
DITCHES						
SNOWBANK						
PARKED AIRCRAFT (UNATTENDED)						
AUTOMOBILE						
DIRT BANK	1			1	1	2.63
OTHER						
BIRD STRIKE						



## ANALYTIC TABLE

FIRST  
TYPE OF ACCIDENTDESTROYED  
SUBSTANTIAL  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STALL

SPIN

SPIRAL

1

1

1

2.63

MUSH

3

3

3

7.89

FIRE OR EXPLOSION

IN FLIGHT

1

1

1

2.63

ON GROUND

AIRFRAME FAILURE

IN FLIGHT

1

1

1

2.63

ON GROUND

ENGINE TEARAWAY

ENGINE FAILURE OR MALFUNCTION

4 4

8

8

21.05

PROPELLER/ROTOR FAILURE

PROPELLER

TAIL ROTOR

MAIN ROTOR

PROP ROTOR ACNT TO PERSON

JET INTAKE/EXH ACNT TO PERS

PROPELLER/JET/ROTOR BLAST

TURBULENCE

1

1

1

2.63

HAIL DAMAGE TO AIRCRAFT

LIGHTNING STRIKE

EVASIVE MANEUVER

UNCONTROLLED ALT DEVIATION

DITCHING

MISSING ACFT NOT RECOVERED

MISCELLANEOUS/OTHER

UNDETERMINED

RECORDS

19 18 1

38

ACCIDENTS

19 18 1

38

PERCENTS

50.0 47.4 .0 2.6

## ANALYTIC TABLE

FIRST PHASE OF OPERATION BY INJURY INDEX  
LARGE FIXED WING

FIRST  
OPERATIONAL PHASE

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STATIC

STARTING ENGINE/S

IDLING ENGINE/S

ENGINE RUNUP

IDLING ROTORS

PARKED-ENGINES NOT OPERATING

OTHER

TAXI

TO TAKEOFF

FROM LANDING

OTHER

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

2 2 5.26

INITIAL CLIMB

4 4

8 8 21.05

VERTICAL

RUNNING (ROTORCRAFT/VTOL-STOL)

ABORTED (FIXED-WING)

1

1 1 2.63

ABORTED (ROTORCRAFT/VTOL)

ABORTED (ROTORCRAFT/STOL)

OTHER

INFLIGHT

CLIMB TO CRUISE

1 1

2 2 5.26

NORMAL CRUISE

1 1 1 1

4 4 10.53

DESCENDING

1

1 1 2.63

HOLDING (IFR)

HOVERING

POWER-ON DESCENT (ROTORCRAFT)

AUTOROTATIVE DESCENT

ACROBATICS

BUZZING

UNCONTROLLED DESCENT

3

3 3 7.89

## ANALYTIC TABLE

FIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

EMERGENCY DESCENT

LOW PASS

OTHER

EN ROUTE TO TREAT CRCP

EN ROUTE TO RELOADING AREA

SURVEY FIELD/AREA

STARTING SWATH RUN

SWATH RUN

FLAREOUT FOR SWATH RUN

PULLUP FROM SWATH RUN

PROCEDURE TURNAROUND

1

1

1

2.63

CLEANUP SWATH

MANEUVER TO AVOID OBSTRUCTION

RETURN TO STRIP

LANDING

TRAFFIC PATTERN-CIRCLING

1

1

2

2

5.26

FINAL APPROACH (VFR)

INITIAL APPROACH

FINAL APPROACH (IFR)

1

1

1

2.63

LEVEL OFF/TOUCHDOWN

2

4

6

6

15.79

ROLL (FIXED WING)

2

1

4

7

7

18.42

ROLL-ON/RUN-ON (ROTORCRAFT)

POWER-ON LANDING (ROTORCRAFT)

POWER-OFF AUTOROTATIVE LDG

GO-AROUND (VFR)

MISSED APPROACH (IFR)

OTHER

UNKNOWN/NOT REPORTED

RECORDS

11 6 3 18

38

ACCIDENTS

11 6 3 18

38

PERCENTS

28.9 15.8 7.9 47.4

CAUSE/FACTOR TABLE  
LARGE FIXED WING  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 32 TOTAL ACCIDENTS

INVOLVES 6 FATAL ACCIDENTS

BROAD CAUSE/FACTOR -----	FATAL ACCIDENTS -----			NONFATAL ACCIDENTS -----			ALL ACCIDENTS -----		
	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----
PILOT	5 83.33	.00	5 83.33	20 76.92	2 7.69	21 80.77	25 78.13	2 6.25	26 81.25
PERSONNEL	2 33.33	1 16.67	3 50.00	6 23.08	.00	6 23.08	8 25.00	1 3.13	9 28.13
AIRFRAME	.00	.00	.00	.00	.00	.00	.00	.00	.00
LANDING GEAR	.00	.00	.00	1 3.85	.00	1 3.85	1 3.13	.00	1 3.13
POWERPLANT	1 16.67	.00	1 16.67	5 19.23	.00	5 19.23	6 18.75	.00	6 18.75
SYSTEMS	.00	.00	.00	1 3.85	1 3.85	2 7.69	1 3.13	1 3.13	2 6.25
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	1 3.85	1 3.85	.00	1 3.13	1 3.13
WEATHER	.00	.00	.00	2 7.69	5 19.23	7 26.92	2 6.25	5 15.63	7 21.88
TERRAIN	.00	.00	.00	2 7.69	4 15.38	6 23.08	2 6.25	4 12.50	6 18.75
MISCELLANEOUS	.00	.00	.00	2 7.69	.00	2 7.69	2 6.25	.00	2 6.25
UNDETERMINED	1 16.67	.00	1 16.67	.00	.00	.00	1 3.13	.00	1 3.13

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  
LARGE FIXED WING  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 32 TOTAL ACCIDENTS

INVOLVES 6 FATAL ACCIDENTS

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
<b>** PILOT **</b>									
PILOT IN COMMAND									
ATTEMPTED OPERATION W/KNOWN DEFICIENCIES IN EQUIPMENT	1		1	1		1	2		2
ATTEMPTED OPERATION BEYOND EXPERIENCE/ABILITY LEVEL				2		2	2		2
DELAYED ACTION IN ABORTING TAKEOFF				2		2	2		2
RETRACTED GEAR PREMATURELY				1		1	1		1
FAILED TO SEE AND AVOID OTHER AIRCRAFT	1		1				1		1
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	2		2	2		2	4		4
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC				3		3	3		3
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				1		1	1		1
IMPROPER LEVEL OFF				1		1	1		1
IMPROPER IN-FLIGHT DECISIONS OR PLANNING	1		1	1		1	2		2
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING	2		2	2	1	3	4	1	5
INADEQUATE SUPERVISION OF FLIGHT				1		1	1		1
LACK OF FAMILIARITY WITH AIRCRAFT				1		1	1		1
MISMANAGEMENT OF FUEL				2		2	2		2
SELECTED UNSUITABLE TERRAIN				3		3	3		3
FAILED TO ASSURE THE GEAR WAS DOWN AND LOCKED				1		1	1		1
MISJUDGED DISTANCE AND SPEED				2	1	3	2	1	3
MISUNDERSTANDING OF ORDERS OR INSTRUCTIONS	1		1				1		1
FAILED TO MAINTAIN DIRECTIONAL CONTROL				3		3	3		3
SELECTED WRONG RUNWAY RELATIVE TO EXISTING WIND				1		1	1		1
SUBTOTAL	8		8	30	2	32	38	2	40
COPILOT									
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				1		1	1		1
SUBTOTAL				1		1	1		1
<b>** PERSONNEL **</b>									
FLIGHT INSTRUCTOR									
MAINTENANCE, SERVICING, INSPECTION									
INADEQUATE INSPECTION OF AIRCRAFT (MAINTENANCE PERSONNEL)				1		1	1		1
INADEQUATE MAINTENANCE AND INSPECTION	1		1	3		3	4		4
OPERATIONAL SUPERVISORY PERSONNEL									
WEATHER PERSONNEL									
TRAFFIC CONTROL PERSONNEL									
OTHER									
AIRPORT SUPERVISORY PERSONNEL		1	1					1	1
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
POOR/INADEQUATE DESIGN				1		1	1		1
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT	1		1				1		1
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
FLIGHT ATTENDANT				1		1	1		1
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL	2	1	3	6		6	8	1	9
<b>** AIRFRAME **</b>									
WINGS									
FUSELAGE									
LANDING GEAR									
BRAKING SYSTEM (NORMAL)				1		1	1		1
FLIGHT CONTROL SURFACES									
SUBTOTAL				1		1	1		1
<b>** POWERPLANT **</b>									

## 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									
MASTER AND CONNECTING RODS				1		1	1		1
CYLINDER ASSEMBLY				1		1	1		1
PISTON, PISTON RINGS				1		1	1		1
VALVE ASSEMBLIES	1		1	1		1	2		2
IGNITION SYSTEM									
MAGNETOES				1		1	1		1
IGNITION HARNESS, SHIELDING				1		1	1		1
FUEL SYSTEM									
CARBURETOR				1		1	1		1
LUBRICATING SYSTEM									
COOLING SYSTEM									
PROPELLER AND ACCESSORIES									
GOVERNORS				1		1	1		1
EXHAUST SYSTEM									
STACKS	1		1				1		1
ENGINE ACCESSORIES									
ENGINE CONTROLS									
POWERPLANT-INSTRUMENTS									
MISCELLANEOUS									
REDUCTION GEAR ASSEMBLY									
COMPRESSOR ASSEMBLY									
COMBUSTION ASSEMBLY									
TURBINE ASSEMBLY									
ACCESSORY DRIVE ASSEMBLY									
LUBRICATING SYSTEM									
FUEL SYSTEM									
SAFETY SYSTEM									
IGNITION SYSTEM									
TORQUEMETER									
AIR BLEED									
EXHAUST SYSTEM									
THRUST REVERSER									
PROPELLER SYSTEM									
CONSTANT SPEED DRIVE									
POWER LEVER									
PROPELLER LEVER									
REVERSE THRUST LEVER									
ENGINE INDICATING EQUIPMENT									
ENGINE INSTALLATION									
SUBTOTAL	2		2	8		8	10		10
** SYSTEMS **									
ELECTRICAL SYSTEM									
HYDRAULIC SYSTEM									
HYDRAULIC PUMPS					1	1		1	1
RESERVOIR, LINES, FITTINGS				1		1	1		1
FLIGHT CONTROL SYSTEMS									
ANTI-ICING, DE-ICING SYSTEMS									
AIR CONDITION, HEATING AND PRESSURIZATION									
AUTO PILOT									
FIRE WARNING SYSTEM									
FIRE EXTINGUISHER SYSTEM									
OXYGEN SYSTEM									
OTHER SYSTEMS									
SUBTOTAL				1	1	2	1	1	2
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
AIRPORT CONDITIONS									
WET RUNWAY					1	1		1	1
SOFT SHOULDERS (RAMP/TAXIWAY)					1	1		1	1
AIRWAYS FACILITIES									
SUBTOTAL					2	2		2	2
** WEATHER **									
LOW CEILING					2	2		2	2
RAIN					2	2		2	2
UNFAVORABLE WIND CONDITIONS					3	3		3	3
WIND SHEAR				1		1	1		1

# CAUSE/FACTOR TABLE

WEATHER (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS				1		1	1		1
SUBTOTAL				2	7	9	2	7	9
** TERRAIN **									
WET, SOFT GROUND					1	1		1	1
ROUGH/UNEVEN				1	2	3	1	2	3
OTHER				1	1	2	1	1	2
SUBTOTAL				2	4	6	2	4	6
** MISCELLANEOUS **									
UNDETERMINED	1		1				1		1
UNQUALIFIED PERSON OPERATED AIRCRAFT				1		1	1		1
DIRECT ENTRIES				2		2	2		2
SUBTOTAL	1		1	3		3	4		4
GRAND TOTAL	13	1	14	54	16	70	67	17	84
** MISCELLANEOUS ACTS, CONDITIONS **									
LEAK/LEAKAGE				2		2	2		2
LOW COMPRESSION				1		1	1		1
DOWNWIND					1	1		1	1
CHAFFED				1		1	1		1
DISCONNECTED				1		1	1		1
EXCESSIVE-WEAR/PLAY				1		1	1		1
OBSTRUCTED				1		1	1		1
SEAT BELT SIGN ON					1	1		1	1
INTENTIONAL GROUND-WATER LOOP-SWERVE				2		2	2		2
RAN OFF END OF RUNWAY					2	2		2	2
IMPROPER EMERGENCY PROCEDURES		1	1	2		2	2	1	3
SEAT BELT NOT FASTENED				1		1	1		1
NOT ALLIGNED WITH RUNWAY/INTENDED LANDING AREA				1		1	1		1
FLEW INTO BLIND CANYON	1		1				1		1
STOLEN OR UNAUTHORIZED USE OF AIRCRAFT					1	1		1	1
HYDRAULIC FAILURE					1	1		1	1
FAILURE OF TWO OR MORE ENGINES				1	1	2	1	1	2
FIRE IN ENGINE	1		1	1		1	2		2
PILOT FATIGUE		1	1					1	1
FUEL EXHAUSTION				1		1	1		1
ICE-IN FUEL				1		1	1		1
AIRFRAME ICE	1		1	1		1	2		2
IMPROPERLY LOADED AIRCRAFT-WEIGHT-AND/OR CG		1	1					1	1
SIMULATED CONDITIONS					1	1		1	1
AIRCRAFT CAME TO REST IN WATER					1	1		1	1
TOUCH AND GO LANDING					1	1		1	1
HYDROPLANING ON WET RUNWAY					2	2		2	2
OVERLOAD FAILURE					6	6		6	6
MATERIAL FAILURE				1	1	2	1	1	2

## DIRECT ENTRY CAUSES

INADOT TRNG ACFT MFCR-INADOT SUPVSD TRNG-OPRTR  
INADOT TRNG ACFT MFCR-INADOT SUPVSD TRNG-OPRTR

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

## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
LARGE FIXED WINGKIND OF FLYINGFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

INSTRUCTIONAL

DUAL 1 1 2.63

SOLO

CHECK

TRAINING

NONCOMMERCIAL

PLEASURE 1 1 2 2 5.26

PRACTICE 1 1 2.63

BUSINESS 1 1 2.63

CORPORATE/EXECUTIVE 4 3 4 11 11 28.95

AERIAL SURVEY

COMPANY FLIGHT 1 1 2.63

OTHER

COMMERCIAL

AERIAL APPLICATION 1 1 2.63

CROP CONTROL RELATED FLIGHT 1 1 2.63

FIRE CONTROL

FIRE CONTROL RELATED FLIGHT

AERIAL MAPPING/PHOTOGRAPHY

AERIAL ADVERTISING

POWER AND PIPELINE PATROL

FISH SPOTTING

AIR TAXI-PASSENGER OPERATIONS 3 1 1 5 5 13.16

AIR TAXI-CARGO OPERATIONS 1 1 2.63

CONSTRUCTION WORK

SCHEDULED PASSENGER SERVICE

SCHEDULED CARGO SERVICE

INTRA-STATE CHARTER PASSG.

INTRA-STATE CHARTER CARGO.

MILITARY CONTRACT-PASSENGER

MILITARY CONTRACT-CARGO

CHARTER CARGO-DOMESTIC 2 2 2 5.26

CHARTER PASSG-DOMESTIC

CHARTER-CARGO-INTERNATIONAL 1 1 2.63

CHARTER-PASSG-INTERNATIONAL

OTHER

UNKNOWN/NOT REPORTED



## ANALYTIC TABLE

KIND OF FLYING

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

MISCELLANEOUS

EXPERIMENTATION

TEST

DEMONSTRATION

FERRY

1 1 2

4 4 10.53

SEARCH AND RESCUE

AIR SHOW/AIR RACING

PARACHUTE JUMP

PARACHUTE JUMP-AIR SHOW

TOWING GLIDERS

SEEDING CLOUDS

HUNTING

POLICE PATROL

HIGHWAY TRAFFIC ADVISORY

ALL OTHER PUBLIC FLYING

OTHER

1 1 2

4 4 10.53

UNKNOWN/NOT REPORTED

2

2 2 5.26

RECORDS

11 6 3 18

38

ACCIDENTS

11 6 3 18

38

PERCENTS

28.9 15.8 7.9 47.4

INJURIES, ACCIDENTS  
LARGE FIXED WING

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	9	5	4	20		38
COPILOT	10	4	4	13		31
DUAL STUDENT				1		1
CHECK PILOT						
FLIGHT ENGINEER	2			1		3
NAVIGATOR						
CABIN ATTENDANT	1	1		1		3
EXTRA CREW	2			1		3
PASSENGERS	41	24	3	57		125
TOTAL	65	34	11	94	ABOARD	204
* OTHER AIRCRAFT	1					1
OTHER GROUND			1			1
GRAND TOTAL	66	34	12	94		206

INVOLVES 38 TOTAL ACCIDENTS  
INVOLVES 11 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



**GENERAL AVIATION ACCIDENTS**

**ROTORCRAFT**



## ANALYTIC TABLE

TYPE OF ACCIDENT BY AIRCRAFT DAMAGE  
ROTORCRAFTFIRST  
TYPE OF ACCIDENTDESTROYED  
SUBSTANTIAL  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

GROUND-WATER LOOP-SWERVE	4		4	1.46
DAGGED WINGTIP POD OR FLOAT				
WHEELS-UP LANDING				
WHEELS-DOWN LANDING IN WATER				
GEAR COLLAPSED	1		1	.36
GEAR RETRACTED				
HARD LANDING	3	24	27	9.85
NOSE OVER/DOWN	2		2	.73
ROLL OVER	6	7	13	4.74
OVERSHOOT				
UNDERSHOOT	1	1	2	.73
<u>COLLISION BETWEEN AIRCRAFT</u>				
BOTH IN FLIGHT		1 1	2	.73
ONE AIRBORNE				
BOTH ON GROUND				
<u>COLLISION WITH GROUND/WATER</u>				
CONTROLLED	6	17	23	8.39
UNCONTROLLED	13	11	24	8.76
<u>COLLIDED WITH</u>				
WIRFS/POLES	10	14	24	8.76
TREES	1	3	4	1.46
RESIDENCE/S				
BUILDING/S	2		2	.73
FENCE, FENCEPOSTS	1	2	3	1.09
ELECTRONIC TOWERS	1		1	.36
RUNWAY OR APPROACH LIGHTS				
AIRPORT HAZARD				
ANIMALS				
CROP	3		3	1.09
FLAGMAN LOADER				
DITCHES	1		1	.36
SNOWBANK	1		1	.36
PARKED AIRCRAFT (UNATTENDED)				
AUTOMOBILE	1		1	.36
DIRT BANK	2		2	.73
OTHER	1	2	3	1.09
BIRD STRIKE	1		1	.36

## ANALYTIC TABLE

FIRST  
TYPE OF ACCIDENTDESTROYED  
SUBSTANTIAL  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STALL	1				1	1	.36
SPIN							
SPIRAL							
MUSH	1				1	1	.36
<u>FIRE OR EXPLOSION</u>							
IN FLIGHT	1	1			2	2	.73
ON GROUND							
<u>AIRFRAME FAILURE</u>							
IN FLIGHT	7	5			12	12	4.38
ON GROUND	1	2			3	3	1.09
ENGINE TEARAWAY							
ENGINE FAILURE OR MALFUNCTION	17	66			83	83	30.29
PROPELLER/ROTOR FAILURE							
PROPELLER							
TAIL ROTOR	2	11			13	13	4.74
MAIN ROTOR	3	5			8	8	2.92
PROP ROTOR ACNT TO PERSON			1		1	1	.36
JET INTAKE/EXH ACNT TO PERS							
PROPELLER/JET/ROTOR BLAST							
TURBULENCE							
HAIL DAMAGE TO AIRCRAFT							
LIGHTNING STRIKE							
EVASIVE MANEUVER							
UNCONTROLLED ALT DEVIATION							
DITCHING							
MISSING ACFT NOT RECOVERED	1				1	1	.36
MISCELLANEOUS/OTHER	1	2		1	4	4	1.46
UNDETERMINED	1				1	1	.36
RECORDS	77	193	2	2	274		
ACCIDENTS	77	193	2	2		274	
PERCENTS	28.1	70.4	.7	.7			

## ANALYTIC TABLE

PHASE OF OPERATION BY INJURY INDEX  
ROTORCRAFTFIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STATIC

STARTING ENGINE/S

IDLING ENGINE/S

ENGINE RUNUP

IDLING ROTORS

PARKED-ENGINES NOT OPERATING

OTHER

TAXI

TO TAKEOFF

FROM LANDING

OTHER

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

INITIAL CLIMB

VERTICAL

RUNNING (ROTORCRAFT/VTOL-STOL)

ABORTED (FIXED-WING)

ABORTED (ROTORCRAFT/VTOL)

ABORTED (ROTORCRAFT/STOL)

OTHER

INFLIGHT

CLIMB TO CRUISE

NORMAL CRUISE

DESCENDING

HOLDING (IFR)

HOVERING

POWER-ON DESCENT (ROTORCRAFT)

AUTOROTATIVE DESCENT

ACROBATICS

BUZZING

UNCONTROLLED DESCENT



## ANALYTIC TABLE

FIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

## EMERGENCY DESCENT

LOW PASS	1	1	1	3	6	6	2.19
OTHER	2		3	2	7	7	2.55
EN ROUTE TO TREAT GROUP			1	2	3	3	1.09
EN ROUTE TO RELOADING AREA				3	3	3	1.09
SURVEY FIELD/AREA							
STARTING SWATH RUN		4	4	3	11	11	4.01
SWATH RUN		1	1	11	13	13	4.74
FLAREOUT FOR SWATH RUN				1	1	1	.36
PULLUP FROM SWATH RUN		1	1		2	2	.73
PROCEDURE TURNAROUND	1			9	10	10	3.65
CLEANUP SWATH		1			1	1	.36
MANEUVER TO AVOID OBSTRUCTION			2		2	2	.73
RETURN TO STRIP		1		3	4	4	1.46

## LANDING

TRAFFIC PATTERN-CIRCLING	3	1			4	4	1.46
FINAL APPROACH (VFR)			4	4	8	8	2.92
INITIAL APPROACH							
FINAL APPROACH (IFR)		1			1	1	.36
LEVEL OFF/TOUCHDOWN			1	2	3	3	1.09
ROLL (FIXED WING)							
ROLL-ON/RUN-ON (ROTORCRAFT)	1			1	2	2	.73
POWER-ON LANDING (ROTORCRAFT)		4	5	13	22	22	8.03
POWER-OFF AUTOMATIC LANDING			3	10	13	13	4.74
GO-AROUND (VFR)	1	1	1	1	4	4	1.46
MISSED APPROACH (IFR)							
OTHER				1	1	1	.36
UNKNOWN/NOT REPORTED	2				2	2	.73

RECORDS	29	32	62	151
ACCIDENTS	29	32	62	151
PERCENTS	10.6	11.7	22.6	55.1

274
274

# CAUSE/FACTOR TABLE

## ROTORCRAFT ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 267 TOTAL ACCIDENTS

INVOLVES 25 FATAL ACCIDENTS

BROAD CAUSE/FACTOR -----	FATAL ACCIDENTS -----			NONFATAL ACCIDENTS -----			ALL ACCIDENTS -----		
	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----
PILOT	19 76.00	19 .00	19 76.00	161 66.53	20 8.26	163 67.36	180 67.42	20 7.49	182 68.16
PERSONNEL	4 16.00	4 .00	4 16.00	34 14.05	4 1.65	38 15.70	38 14.23	4 1.50	42 15.73
AIRFRAME	1 .00	1 4.00	1 4.00	1 .00	1 .00	1 .00	1 .00	1 .37	1 .37
LANDING GEAR	1 .00	1 .00	1 .00	1 .41	1 .00	1 .41	1 .37	1 .00	1 .37
POWERPLANT	3 12.00	3 .00	3 12.00	51 21.07	4 1.65	52 21.49	54 20.22	4 1.50	55 20.60
SYSTEMS	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00
INSTRUMENTS/EQUIPMENT & ACCESSORIES	1 .00	1 .00	1 .00	1 .41	3 1.24	4 1.65	1 .37	3 1.12	4 1.50
ROTORCRAFT	4 16.00	4 .00	4 16.00	29 11.98	1 .41	30 12.40	33 12.36	1 .37	34 12.73
AIRPORT/AIRWAYS/FACILITIES	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00	1 .00
WEATHER	6 .00	6 24.00	6 24.00	3 1.24	34 14.05	35 14.46	3 1.12	40 14.98	41 15.36
TERRAIN	1 .00	1 4.00	1 4.00	15 6.20	52 21.49	67 27.69	15 5.62	53 19.85	68 25.47
MISCELLANEOUS	1 4.00	1 .00	1 4.00	15 6.20	1 .41	16 6.61	16 5.99	1 .37	17 6.37
UNDETERMINED	2 8.00	2 .00	2 8.00	4 1.65	4 .00	4 1.65	6 2.25	6 .00	6 2.25

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

ROTORCRAFT  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 267 TOTAL ACCIDENTS

INVOLVES 25 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 BEYOND EXPERIENCE/ABILITY LEVEL				2	2	4	2	2	4
BECAME LOST/DISORIENTED				1	1	1	1	1	1
CONTINUED VFR FLIGHT INTO ADVERSE WEATHER CONDITIONS	3	3	3	2	2	4	5	2	7
DELAYED IN INITIATING GO-AROUND				1		1	1		1
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT	1	1	1	3	3	6	4	3	7
FAILED TO SEE AND AVOID OTHER AIRCRAFT	1	1	1	1		1	2		2
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS	1	1	1	18		18	19		19
FAILED TO OBTAIN/MAINTAIN FLYING SPEED				2		2	2		2
MISJUDGED, SPEED, ALTITUDE OR CLEARANCE				1		1	1		1
FAILED TO MAINTAIN ADEQUATE ROTOR RPM	5	5	5	33		33	38		38
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC	1	1	1	2		2	3		3
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				6	1	7	6	1	7
IMPROPER OPERATION OF BRAKES AND/OR FLIGHT CONTROLS				4		4	4		4
IMPROPER OPERATION OF FLIGHT CONTROLS	8	8	8	32	2	34	40	2	42
IMPROPER LEVEL OFF				5		5	5		5
IMPROPER IN-FLIGHT DECISIONS OR PLANNING	3	3	3	10	1	11	13	1	14
IMPROPER COMPENSATION FOR WIND CONDITIONS				6	1	7	6	1	7
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING	1	1	1	29	1	30	30	1	31
INADEQUATE SUPERVISION OF FLIGHT	1	1	1	12	1	13	13	1	14
LACK OF FAMILIARITY WITH AIRCRAFT	1	1	1	2	1	3	3	1	4
MISMANAGEMENT OF FUEL	2	2	2	12		12	14		14
EXERCISED POOR JUDGMENT	1	1	1				1		1
SELECTED UNSUITABLE TERRAIN				5	1	6	5	1	6
INITIATED FLIGHT IN ADVERSE WEATHER CONDITIONS				1		1	1		1
SPONTANEOUS-IMPROPER ACTION				2		2	2		2
MISJUDGED DISTANCE, SPEED, AND ALTITUDE				1		1	1		1
MISJUDGED DISTANCE AND ALTITUDE				4	1	5	4	1	5
MISJUDGED SPEED AND ALTITUDE				6		6	6		6
MISJUDGED ALTITUDE AND CLEARANCE				3		3	3		3
MISJUDGED ALTITUDE				4		4	4		4
MISJUDGED CLEARANCE	1	1	1	12		12	13		13
IMPROPER RECOVERY FROM BOUNCED LANDING					1	1		1	1
PHYSICAL IMPAIRMENT					1	1		1	1
SPATIAL DISORIENTATION	2	2	2	2		2	4		4
FAILED TO MAINTAIN DIRECTIONAL CONTROL				1		1	1		1
FAILED TO INITIATE GO-AROUND					2	2		2	2
SUBTOTAL	32	32	32	224	22	246	256	22	278
COPILOT									
DELAYED IN INITIATING GO-AROUND	1	1	1				1		1
IMPROPER COMPENSATION FOR WIND CONDITIONS	1	1	1				1		1
SUBTOTAL	2	2	2				2		2
DUAL STUDENT									
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS				1		1	1		1
FAILED TO MAINTAIN ADEQUATE ROTOR RPM				3		3	3		3
IMPROPER OPERATION OF POWERPLANT + POWERPLANT CONTROLS				1		1	1		1
IMPROPER OPERATION OF FLIGHT CONTROLS				4		4	4		4
CONTROL INTERFERENCE				1		1	1		1
MISJUDGED DISTANCE, SPEED, AND ALTITUDE					1	1		1	1
MISJUDGED DISTANCE AND ALTITUDE				2		2	2		2
MISJUDGED SPEED AND ALTITUDE				2		2	2		2
FAILED TO MAINTAIN DIRECTIONAL CONTROL				1		1	1		1
SUBTOTAL				15	1	16	15	1	16
CHECK PILOT									
INADEQUATE SUPERVISION OF FLIGHT				1		1	1		1
SUBTOTAL				1		1	1		1

## CAUSE/FACTOR TABLE

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
** PERSONNEL **									
FLIGHT INSTRUCTOR									
INADEQUATE TRAINING OF STUDENT					1	1		1	1
MAINTENANCE, SERVICING, INSPECTION									
IMPROPER MAINTENANCE(MAINTENANCE PERSONNEL)				5		5	5		5
IMPROPERLY SERVICED AIRCRAFT(GROUND CREW)				1		1	1		1
INADEQUATE INSPECTION OF AIRCRAFT(MAINTENANCE PERSONNEL)				1	1	2	1	1	2
INADEQUATE MAINTENANCE AND INSPECTION	1		1	14		14	17		17
UNK/NR				1		1	1		1
OPERATIONAL SUPERVISORY PERSONNEL									
FAILURE TO PROVIDE ADEQ DIRECTIVES, MANUALS, EQUIPMENT				2		2	2		2
DEFICIENCY, COMPANY MAINTAINED EQMT, SERV, REGULATIONS				2		2	2		2
WEATHER PERSONNEL									
TRAFFIC CONTROL PERSONNEL									
AIRPORT SUPERVISORY PERSONNEL									
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
POOR/INADEQUATE DESIGN				1		1	1		1
OTHER	1		1	1		1	2		2
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT				1		1	1		1
GROUND SIGNALMAN				1		1	1		1
GROUND CREWMAN	1		1				1		1
PASSENGER				1		1	1		1
DRIVER OF VEHICLE				1		2	1		2
OTHER	1		1	1	1	2	2	1	3
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL	4		4	35	4	39	39	4	43
** AIRFRAME **									
WINGS									
FUSELAGE									
LANDING GEAR									
SKID ASSEMBLY				1		1	1		1
FLIGHT CONTROL SURFACES									
RUDDER, SURFACES ATTACHMENTS		1	1					1	1
SUBTOTAL		1	1	1		1	1	1	2
** POWERPLANT **									
ENGINE STRUCTURE									
CRANKCASE				1		1	1		1
MASTER AND CONNECTING RODS				3		3	3		3
CYLINDER ASSEMBLY				2		2	2		2
PISTON, PISTON RINGS				2		2	2		2
VALVE ASSEMBLIES				3		3	3		3
IGNITION SYSTEM									
MAGNETOES				1		1	1		1
SPARK PLUG				2		2	2		2
LOW TENSION WIRING				1		1	1		1
SWITCHES				1		1	1		1
FUEL SYSTEM									
TANKS				1		1	1		1
LINE AND FITTINGS				5		5	5		5
FILTERS, STRAINERS, SCREENS					1	1		1	1
FUEL INJECTION SYSTEM				1		1	1		1
RAM AIR ASSEMBLY				1		1	1		1
OTHER				1		1	1		1
LUBRICATING SYSTEM									
COOLING SYSTEM									
OTHER				1		1	1		1
PROPELLER AND ACCESSORIES									
EXHAUST SYSTEM									
MANIFOLDS				1		1	1		1
ENGINE ACCESSORIES									
ENGINE CONTROLS									
THROTTLE-POWER LEVER ASSEMBLIES				3		3	3		3
FUEL INJECTION CONTROL				1		1	1		1
POWERPLANT-INSTRUMENTS									
FUEL QUANTITY GAUGE					1	1		1	1

CAUSE/FACTOR TABLE

POWERPLANT (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
MISCELLANEOUS									
POWERPLANT FAILURE FOR UNDETERMINED REASONS	3		3	18		18	21		21
COMPRESSOR STALLS				1		1	1		1
REDUCTION GEAR ASSEMBLY									
COMPRESSOR ASSEMBLY									
CASTING				1		1	1		1
BEARING, ROTOR SHAFT				1		1	1		1
COMBUSTION ASSEMBLY									
SEALS, EXPANSION				1		1	1		1
TURBINE ASSEMBLY									
ACCESSORY DRIVE ASSEMBLY									
GEARS, ACCESSORY DRIVE				1		1	1		1
LUBRICATING SYSTEM									
FUEL SYSTEM									
PUMP, FUEL					1	1		1	1
FUEL CONTROL					1	1		1	1
OTHER				1		1	1		1
SAFETY SYSTEM									
IGNITION SYSTEM									
TORQUEMETER									
AIR BLEED									
EXHAUST SYSTEM									
THRUST REVERSER									
PROPELLER SYSTEM									
CONSTANT SPEED DRIVE									
POWER LEVER									
PROPELLER LEVER									
REVERSE THRUST LEVER									
ENGINE INDICATING EQUIPMENT									
ENGINE INSTALLATION									
SUBTOTAL	3		3	55	4	59	58	4	62
** INSTRUMENTS/EQUIPMENT AND ACCESSORIES **									
FLIGHT AND NAVIGATION INSTRUMENTS									
COMMUNICATIONS AND NAVIGATION EQUIPMENT									
OTHER					1	1		1	1
MISCELLANEOUS EQUIPMENT									
SPRAY, DUSTING EQUIPMENT				1	1	2	1	1	2
PICK-UP EQUIPMENT					1	1		1	1
SUBTOTAL				1	3	4	1	3	4
** ROTORCRAFT **									
ROTOR ASSEMBLIES									
MAIN ROTOR BLADES				3		3	3		3
TAIL ROTOR BLADES				3		3	3		3
MAIN ROTOR HEAD ASSEMBLIES				1		1	1		1
BEARINGS				2		2	2		2
OTHER				1		1	1		1
TRANSMISSION ROTOR DRIVE SYSTEM									
ENGINE DRIVE SHAFT				2		2	2		2
FREE WHEEL UNIT				1		1	1		1
MAIN ROTOR GEAR BOX							1		1
TAIL ROTOR DRIVE SHAFT ASSEMBLY	1		1	2		2	2		2
TAIL ROTOR GEAR BOX				3	1	4	3	1	4
CLUTCH ASSEMBLY				4		4	4		4
OTHER	1		1	3		3	4		4
FLIGHT CONTROL SYSTEMS									
CYCLIC PITCH CONTROL SYSTEM	1		1	1		1	2		2
COLLECTIVE PITCH CONTROL SYSTEM				1		1	1		1
TAIL ROTOR PITCH CONTROL SYSTEM				2		2	2		2
STABILIZING SURFACES-DAMPERS				1		1	1		1
MISCELLANEOUS UNITS AND ASSEMBLIES									
TAIL BOOMS/PYLONS/CONES	1		1	2		2	3		3
OTHER				1		1	1		1
SUBTOTAL	4		4	33	1	34	37	1	38
** WEATHER **									
LOW CEILING		3	3		3	3		6	6
RAIN		2	2					2	2
FOG		2	2		3	3		5	5

## CAUSE/FACTOR TABLE

## WEATHER (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
SNOW		1	1		3	3		4	4
ICING CONDITIONS-INCLUDES SLEET, FREEZING RAIN, ETC		1	1					1	1
CONDITIONS CONDUCTIVE TO CARB/INDUCTION SYSTEM ICING					1	1		1	1
UNFAVORABLE WIND CONDITIONS		3	3		12	12		15	15
SUDDEN WINDSHIFT				3	1	4	3	1	4
TURBULENCE IN FLIGHT, CLEAR AIR		1	1					1	1
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS					1	1		1	1
DOWNDRAFTS, UPDRAFTS				1	3	4	1	3	4
LOCAL WHIRLWIND					1	1		1	1
HIGH TEMPERATURE					1	1		1	1
HIGH DENSITY ALTITUDE					11	11		11	11
THUNDERSTORM ACTIVITY		1	1					1	1
SUBTOTAL		14	14	4	40	44	4	54	58
** TERRAIN **									
WET, SOFT GROUND					4	4		4	4
SNOW-COVERED				1	1	2	1	1	2
HIGH VEGETATION				2	4	6	2	4	6
HIDDEN OBSTRUCTIONS					2	2		2	2
ROUGH/UNEVEN				3	11	14	3	11	14
HIGH OBSTRUCTIONS		1	1	8	29	37	8	30	38
OTHER				1	1	2	1	1	2
SUBTOTAL		1	1	15	52	67	15	53	68
** MISCELLANEOUS **									
FOREIGN OBJECT DAMAGE				5		5	5		5
FOREIGN MATERIAL AFFECTING NORMAL OPERATIONS	1		1	3		3	4		4
UNDETERMINED	2		2	4		4	6		6
BIRD COLLISION				1		1	1		1
EVASIVE MANEUVER TO AVOID COLLISION				7		7	7		7
UNQUALIFIED PERSON OPERATED AIRCRAFT					1	1		1	1
SUBTOTAL	3		3	20	1	21	23	1	24
GRAND TOTAL	48	16	64	404	128	532	452	144	596
** MISCELLANEOUS ACTS, CONDITIONS **									
UNAPPROVED MODIFICATION		1	1					1	1
PREVIOUS DAMAGE				1		1	1		1
LEAK/LFAGE				1		1	1		1
LOW COMPRESSION				2		2	2		2
DOWNDRAFT					9	9		9	9
CARBON DEPOSITS				2		2	2		2
LOOSE, PART/FITTING				1	1	2	1	1	2
GROUND RESONANCE	1		1				1		1
DISCONNECTED	3		3	1		1	4		4
EXCESSIVE-WEAR/PLAY				2		2	2		2
FLUCTUATING					1	1		1	1
FRICTION, EXCESSIVE				1		1	1		1
GROUNDING				2		2	2		2
IMPROPERLY INSTALLED	1		1	3		3	4		4
JAMMED					1	1		1	1
OBSTRUCTED	1		1	1	1	2	2	1	3
OPEN				1		1	1		1
OVERHEATED				1		1	1		1
PRESSURE, NONE				1		1	1		1
SCORED				1		1	1		1
STRIPPED				1		1	1		1
LOAD NOT JETTISONED				1	2	3	1	2	3
ANTI-ICING/DEICING EQUIP-IMPROPER OPER. OF/FAILED TO USE				1		1	1		1
DISREGARD OF GOOD OPERATING PRACTICE				1		1	1		1
IMPROPER EMERGENCY PROCEDURES				1		1	1		1
INSTRUCTIONS-MISINTERPRETED				1		1	1		1
INSTRUMENTS-MISREAD OR FAILED TO READ				1	1	1		1	1
UNWARRANTED LOW FLYING				1	3	4	1	3	4
INATTENTIVE TO FUEL SUPPLY				1		1	1		1
POORLY PLANNED APPROACH				1	2	3	1	2	3
JETTISONED LOAD					2	2		2	2
IMPROPERLY SECURED	2		2	2		2	4		4
BOGUS PART				1	1	2	1	1	2

CAUSE/FACTOR TABLE

MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
FATIGUE FRACTURE	2		2	9		9	11		11
RPM-UNCONTROLLABLE-OVERSPEED					1	1		1	1
WRONG PART				1		1	1		1
IMPROPER ALIGNMENT/ADJUSTMENT				1	1	2	1	1	2
FAILURE OF TWO OR MORE ENGINES		1	1					1	1
SEPARATION IN FLIGHT		4	4		7	7		11	11
FIRE IN ENGINE					2	2		2	2
LATERAL IMBALANCE				1		1	1		1
PILOT FATIGUE		1	1		3	3		4	4
FUEL EXHAUSTION	1		1	14		14	15		15
FUEL CONTAMINATION-EXCLUSIVE OF WATER IN FUEL	1		1	3	1	4	4	1	5
ICF-CARRIER/TOR				1		1	1		1
IMPROPERLY LOADED AIRCRAFT-WEIGHT-AND/OR CG				2	1	3	2	1	3
INTERFERENCE WITH FLIGHT CONTROLS				4		4	4		4
WHITEOUT				1		1	1		1
LACK OF LUBRICATION-SPECIFIC PART, NOT SYSTEM				1		1	1		1
OIL EXHAUSTION-ENGINE LUBRICATION SYSTEM				1		1	1		1
SIMULATED CONDITIONS				1	4	5	1	4	5
WATER IN FUEL				5		5	5		5
AIRCRAFT CAME TO REST IN WATER		2	2	1	12	13	1	14	15
MISSING				3		3	3		3
OVERLOAD FAILURE				1	7	8	1	7	8
MATERIAL FAILURE	1		1	19	2	21	20	2	22
FUEL STARVATION	2		2	4		4	6		6
IMPROPER CLEARANCE-TOLERANCE				1		1	1		1

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

## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
ROTORCRAFTKIND OF FLYINGFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

INSTRUCTIONAL

DUAL	2	2	4	17	25	25	9.12
SOLO	1	1	2	1	5	5	1.82
CHECK							
TRAINING		1		4	5	5	1.82

NONCOMMERCIAL

PLEASURE	3	4	5	22	34	34	12.41
PRACTICE	2	2	2	8	14	14	5.11
BUSINESS	2		4	6	12	12	4.38
CORPORATE/EXECUTIVE	1		1	6	8	8	2.92
AERIAL SURVEY	1			1	2	2	.73
COMPANY FLIGHT							
OTHER	1				1	1	.36

COMMERCIAL

AERIAL APPLICATION	1	7	6	25	39	39	14.23
CROP CONTROL RELATED FLIGHT		3	4	21	28	28	10.22
FIRE CONTROL			1		1	1	.36
FIRE CONTROL RELATED FLIGHT							
AERIAL MAPPING/PHOTOGRAPHY			1	1	2	2	.73
AERIAL ADVERTISING			1		1	1	.36
POWER AND PIPELINE PATROL				3	3	3	1.09
FISH SPOTTING							
AIR TAXI-PASSENGER OPERATIONS	8	1	10	11	30	30	10.95
AIR TAXI-CARGO OPERATIONS		2	1	2	5	5	1.82
CONSTRUCTION WORK	1	1	2	3	7	7	2.55
SCHEDULED PASSENGER SERVICE							
SCHEDULED CARGO SERVICE							
INTRA-STATE CHARTER PASSG.			1		1	1	.36
INTRA-STATE CHARTER CARGO.							
MILITARY CONTRACT-PASSENGER							
MILITARY CONTRACT-CARGO							
CHARTER CARGO-DOMESTIC		1	1		2	2	.73
CHARTER PASSG-DOMESTIC				1	1	1	.36
CHARTER-CARGO-INTERNATIONAL							
CHARTER-PASSG-INTERNATIONAL							
OTHER	2	2	4	2	10	10	3.65

UNKNOWN/NOT REPORTED



## ANALYTIC TABLE

KIND OF FLYING

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

MISCELLANEOUS

## EXPERIMENTATION

TEST	2	2	6		10	10	3.65
DEMONSTRATION			1		1	1	.36
FERRY		4	4		8	8	2.92
SEARCH AND RESCUE		1	2		3	3	1.09

## AIR SHOW/AIR RACING

## PARACHUTE JUMP

## PARACHUTE JUMP-AIR SHOW

## TOWING GLIDERS

## SEEDING CLOUDS

HUNTING			1	1	2	2	.73
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POLICE PATROL	2		1	1	4	4	1.46
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HIGHWAY TRAFFIC ADVISORY	2				2	2	.73
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ALL OTHER PUBLIC FLYING		2	2	1	5	5	1.82
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OTHER		1	1	1	3	3	1.09
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## UNKNOWN/NOT REPORTED

RECORDS	29	32	62	151	274		
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ACCIDENTS	29	32	62	151		274	
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PERCENTS	10.6	11.7	22.6	55.1			
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# INJURIES, ACCIDENTS ROTORCRAFT

INJURIES					
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN
PILOT	24	28	52	170	
COPILOT	1	3	1	2	
DUAL STUDENT	2	2	2	22	
CHECK PILOT		1			
FLIGHT ENGINEER				1	
NAVIGATOR					
CABIN ATTENDANT			1		
EXTRA CREW	1	1	3	3	
PASSENGERS	25	10	47	92	
TOTAL	53	45	106	290	ABOARD
* OTHER AIRCRAFT	2			3	
OTHER GROUND	1	5			
GRAND TOTAL	56	50	106	293	

INVOLVES 274 TOTAL ACCIDENTS  
INVOLVES 29 FATAL ACCIDENTS

\* INJURIES CARRIED OPPOSITE OTHER-AIRCRAFT ARE INJURIES OCCURRING IN AIRCRAFT THAT ARE NOT PART OF THIS SUBJECT TABULATION, BUT WERE PART OF THE TOTAL INJURIES INVOLVED IN COLLISIONS BETWEEN AIRCRAFT.



**GENERAL AVIATION ACCIDENTS**

**GLIDER AIRCRAFT**



## ANALYTIC TABLE

TYPE OF ACCIDENT BY AIRCRAFT DAMAGE  
GLIDER

FIRST TYPE OF ACCIDENT	TYPE OF ACCIDENT BY AIRCRAFT DAMAGE GLIDER				RECORDS	ACCIDENTS	PERCENT
	DESTROYED	SUBSTANTIAL	MINOR	NONE			
GROUND-WATER LOOP-SWERVE	5	1			6	6	7.69
DRAINED WINGTIP POD OR FLOAT							
WHEELS-UP LANDING							
WHEELS-DOWN LANDING IN WATER							
GEAR COLLAPSED							
GEAR RETRACTED							
HARD LANDING	7				7	7	8.97
NOSE OVER/DOWN							
ROLL OVER							
OVERSHOOT	4				4	4	5.13
UNDERSHOOT	1	13			14	14	17.95
<u>COLLISION BETWEEN AIRCRAFT</u>							
BOTH IN FLIGHT	1	1			2	1	2.56
ONE AIRBORNE							
BOTH ON GROUND							
<u>COLLISION WITH GROUND/WATER</u>							
CONTROLLED	2				2	2	2.56
UNCONTROLLED	2	1			3	3	3.85
<u>COLLIDED WITH</u>							
WIRES/POLES	1	5			6	6	7.69
TREES	6				6	6	7.69
RESIDENCE/S							
BUILDING/S							
FENCE, FENCEPOSTS							
ELECTRONIC TOWERS							
RUNWAY OR APPROACH LIGHTS	1				1	1	1.28
AIRPORT HAZARD							
ANIMALS							
CROP							
FLAGMAN LOADER							
DITCHES							
SNOWBANK							
PARKED AIRCRAFT (UNATTENDED)	4				4	4	5.13
AUTOMOBILE							
DIRT BANK	1				1	1	1.28
OTHER	4	1			5	5	6.41
BIRD STRIKE							

ANALYTIC TABLE

FIRST TYPE OF ACCIDENT	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
STALL	1	2			3	3	3.85
SPIN	1	1			2	2	2.56
SPIRAL	1	1			2	2	2.56
MUSH	1	2			3	3	3.85
<u>FIRE OR EXPLOSION</u>							
IN FLIGHT							
ON GROUND							
<u>AIRFRAME FAILURE</u>							
IN FLIGHT	2	1			3	3	3.85
ON GROUND							
ENGINE TEARAWAY							
ENGINE FAILURE OR MALFUNCTION		1			1	1	1.28
PROPELLER/ROTOR FAILURE							
PROPELLER							
TAIL ROTOR							
MAIN ROTOR							
PROP ROTOR ACNT TO PERSON							
JET INTAKE/EXH ACNT TO PERS							
PROPELLER/JET/ROTOR BLAST							
TURBULENCE							
HAIL DAMAGE TO AIRCRAFT							
LIGHTNING STRIKE							
EVASIVE MANEUVER							
UNCONTROLLED ALT DEVIATION							
DITCHING							
MISSING ACFT NOT RECOVERED							
MISCELLANEOUS/OTHER		2			2	2	2.56
UNDETERMINED		1			1	1	1.28
RECORDS	10	65	3		78		
ACCIDENTS	10	65	3			77	
PERCENTS	12.8	83.3	3.8				

## ANALYTIC TABLE

PHASE OF OPERATION BY INJURY INDEX  
GLIDERFIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STATIC

STARTING ENGINE/S

IDLING ENGINE/S

ENGINE RUNUP

IDLING ROTORS

PARKED-ENGINES NOT OPERATING

OTHER

TAXI

TO TAKEOFF

FROM LANDING

1

1

1

1.28

OTHER

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

6

6

6

7.69

INITIAL CLIMB

4

2

6

6

7.69

VERTICAL

RUNNING (ROTORCRAFT/VTOL-STOL)

ABORTED (FIXED-WING)

1

1

1

1.28

ABORTED (ROTORCRAFT/VTOL)

ABORTED (ROTORCRAFT/STOL)

OTHER

1

1

2

2

2.56

INFLIGHT

CLIMB TO CRUISE

1

1

1

1.28

NORMAL CRUISE

2

2

1

2.56

DESCENDING

1

1

1

1.28

HOLDING (IFR)

HOVERING

POWER-ON DESCENT (ROTORCRAFT)

AUTOROTATIVE DESCENT

ACROBATICS

1

1

2

2

2.56

BUZZING

UNCONTROLLED DESCENT

1

1

1

1.28



## ANALYTIC TABLE

FIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

EMERGENCY DESCENT

LOW PASS

OTHER

1 1

2 2 2.56

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

1 4

5 5 6.41

FINAL APPROACH (VFR)

1 3 5 12

21 21 26.92

INITIAL APPROACH

FINAL APPROACH (IFR)

LEVEL OFF/TOUCHDOWN

1 2 2 9

14 14 17.95

ROLL (FIXED WING)

1 8

9 9 11.54

ROLL-ON/RUN-ON (ROTORCRAFT)

POWER-ON LANDING (ROTORCRAFT)

POWER-OFF AUTOROTATIVE LDG

GO-AROUND (VFR)

1

1 1 1.28

MISSED APPROACH (IFR)

OTHER

1 1

2 2 2.56

UNKNOWN/NOT REPORTED

1

1 1 1.28

RECORDS

7 13 13 45

78

ACCIDENTS

7 13 13 44

77

PERCENTS

9.0 16.7 16.7 57.7

## CAUSE/FACTOR TABLE

GLIDER  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 77 TOTAL ACCIDENTS

INVOLVES 7 FATAL ACCIDENTS

BROAD CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*	CAUSE	FACTOR	TOTAL*
PILOT	5 71.43	1 14.29	5 71.43	64 91.43	3 4.29	64 91.43	69 89.61	4 5.19	69 89.61
PERSONNEL	.00	.00	.00	6 8.57	3 4.29	8 11.43	6 7.79	3 3.90	8 10.39
AIRFRAME	.00	2 28.57	2 28.57	.00	.00	.00	.00	2 2.60	2 2.60
LANDING GEAR	.00	.00	.00	.00	.00	.00	.00	.00	.00
POWERPLANT	.00	.00	.00	.00	.00	.00	.00	.00	.00
SYSTEMS	.00	.00	.00	2 2.86	.00	2 2.86	2 2.60	.00	2 2.60
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	1 1.43	1 1.43	.00	1 1.30	1 1.30
WEATHER	.00	1 14.29	1 14.29	1 1.43	16 22.86	17 24.29	1 1.30	17 22.08	18 23.38
TERRAIN	.00	.00	.00	3 4.29	12 17.14	15 21.43	3 3.90	12 15.58	15 19.48
MISCELLANEOUS	.00	.00	.00	3 4.29	4 5.71	7 10.00	3 3.90	4 5.19	7 9.09
UNDETERMINED	2 28.57	.00	2 28.57	1 1.43	.00	1 1.43	3 3.90	.00	3 3.90

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

GLIDER  
ACCIDENTS WITH ASSIGNED CAUSES ONLY

(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 77 TOTAL ACCIDENTS

INVOLVES 7 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 BEYOND EXPERIENCE/ABILITY LEVEL				1		1	1		1
EXCEEDED DESIGN STRESS LIMITS OF AIRCRAFT	2		2				2		2
FAILED TO SEE AND AVOID OTHER AIRCRAFT				2		2	2		2
FAILED TO SEE AND AVOID OBJECTS OR OBSTRUCTIONS				6		6	6		6
FAILED TO OBTAIN/MAINTAIN FLYING SPEED	1		1	9		9	10		10
MISJUDGED, SPEED, ALTITUDE OR CLEARANCE				1		1	1		1
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC	1		1	2		2	3		3
IMPROPER OPERATION OF FLIGHT CONTROLS	2		2	8	1	9	10	1	11
PREMATURE LIFT OFF				1		1	1		1
IMPROPER LEVEL OFF				3		3	3		3
IMPROPER IN-FLIGHT DECISIONS OR PLANNING				8		8	8		8
IMPROPER COMPENSATION FOR WIND CONDITIONS				2		2	2		2
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING				5		5	5		5
INADEQUATE SUPERVISION OF FLIGHT				1		1	1		1
LACK OF FAMILIARITY WITH AIRCRAFT		1	1	1	3	4	1	4	5
SELECTED UNSUITABLE TERRAIN				3		3	3		3
MISJUDGED DISTANCE, SPEED, AND ALTITUDE				1		1	1		1
MISJUDGED DISTANCE AND SPEED				6		6	6		6
MISJUDGED DISTANCE				1		1	1		1
MISJUDGED DISTANCE AND ALTITUDE	1		1	10	1	11	11	1	12
MISJUDGED SPEED AND CLEARANCE				1		1	1		1
MISJUDGED ALTITUDE AND CLEARANCE				1		1	1		1
MISJUDGED ALTITUDE				1		1	1		1
MISJUDGED CLEARANCE				7		7	7		7
IMPROPER RECOVERY FROM BOUNCED LANDING				1		1	1		1
MISUSED OR FAILED TO USE FLAPS				1		1	1		1
FAILED TO MAINTAIN DIRECTIONAL CONTROL				3		3	3		3
SELECTED WRONG RUNWAY RELATIVE TO EXISTING WIND				2		2	2		2
FAILED TO ABORT TAKEOFF				3		3	3		3
SUBTOTAL	7	1	8	91	5	96	98	6	104
DUAL STUDENT									
MISJUDGED CLEARANCE				1		1	1		1
SUBTOTAL				1		1	1		1
** PERSONNEL **									
FLIGHT INSTRUCTOR									
INADEQUATE SUPERVISION OF FLIGHT				1		1	1		1
MAINTENANCE, SERVICING, INSPECTION									
INADEQUATE INSPECTION OF ACFT(OWNER-PILOT PERSONNEL)				2		2	2		2
OPERATIONAL SUPERVISORY PERSONNEL									
WEATHER PERSONNEL									
TRAFFIC CONTROL PERSONNEL									
AIRPORT SUPERVISORY PERSONNEL									
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT				4	1	5	4	1	5
GROUND CREWMAN					2	2		2	2
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL				7	3	10	7	3	10
** AIRFRAME **									
WINGS									

## CAUSE/FACTOR TABLE

## AIRFRAME (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
SPARS		1	1					1	1
WING ATTACHMENT FITTINGS, BOLTS		1	1					1	1
FUSELAGE									
LANDING GEAR									
FLIGHT CONTROL SURFACES									
SUBTOTAL		2	2					2	2
** SYSTEMS **									
ELECTRICAL SYSTEM									
HYDRAULIC SYSTEM									
FLIGHT CONTROL SYSTEMS									
AILERON AND AILERON TAB CONTROL SYSTEM				2		2	2		2
ANTI-ICING, DE-ICING SYSTEMS									
AIR CONDITION, HEATING AND PRESSURIZATION									
AUTO PILOT									
FIRE WARNING SYSTEM									
FIRE EXTINGUISHER SYSTEM									
OXYGEN SYSTEM									
OTHER SYSTEMS									
SUBTOTAL				2		2	2		2
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
AIRPORT CONDITIONS									
OTHER					1	1		1	1
AIRWAYS FACILITIES									
SUBTOTAL					1	1		1	1
** WEATHER **									
UNFAVORABLE WIND CONDITIONS					9	9		9	9
WIND SHEAR					1	1		1	1
SUDDEN WINDSHIFT				1		1	1		1
TURBULENCE IN FLIGHT, CLEAR AIR					1	1		1	1
TURBULENCE ASSOCIATED WITH CLOUDS AND/OR THUNDERSTORMS					1	1		1	1
DOWNDRAFTS, UPDRAFTS					4	4		4	4
LOCAL WHIRLWIND					1	1		1	1
HIGH DENSITY ALTITUDE					1	1		1	1
OTHER		1	1		1	1		2	2
SUBTOTAL		1	1	1	19	20	1	20	21
** TERRAIN **									
SNOW-COVERED				1		1	1		1
HIGH VEGETATION				1	2	3	1	2	3
HIDDEN OBSTRUCTIONS				1	1	2	1	1	2
ROUGH/UNEVEN					3	3		3	3
HIGH OBSTRUCTIONS					7	7		7	7
SUBTOTAL				3	13	16	3	13	16
** MISCELLANEOUS **									
FOREIGN MATERIAL AFFECTING NORMAL OPERATIONS				1		1	1		1
UNDETERMINED	2		2	1		1	3		3
VORTEX TURBULENCE					1	1		1	1
ANIMAL(S) ON RUNWAY/TAXIWAY/RAMP				1		1	1		1
EVASIVE MANEUVER TO AVOID COLLISION				2	3	5	2	3	5
SUBTOTAL	2		2	5	4	9	7	4	11
GRAND TOTAL	9	4	13	110	45	155	119	49	168
** MISCELLANEOUS ACTS, CONDITIONS **									
DOWNWIND					2	2		2	2
DISCONNECTED				2		2	2		2
FLUTTER					1	1		1	1
OBSTRUCTED				1		1	1		1

CAUSE/FACTOR TABLE

MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
INTENTIONAL GROUND-WATER LOOP-SWERVE					1	1		1	1
NOT ALLIGNED WITH RUNWAY/INTENDED LANDING AREA					1	1		1	1
POORLY PLANNED APPROACH				2	2	4	2	2	4
SEPARATION IN FLIGHT		2	2					2	2
PILOT FATIGUE				1		1	1		1
FUEL CONTAMINATION-EXCLUSIVE OF WATER IN FUEL				1		1	1		1
SIMULATED CONDITIONS				1		1	1		1
OVERLOAD FAILURE		2	2					2	2
FUEL STARVATION				1		1	1		1

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

## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
GLIDERKIND OF FLYINGFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

INSTRUCTIONAL

DUAL 2 2 2.56

SOLO 1 1 1 4 7 7 8.97

CHECK

TRAINING 2 1 2 5 5 6.41NONCOMMERCIAL

PLEASURE 4 8 7 33 52 51 66.67

PRACTICE 2 1 1 4 4 5.13

BUSINESS 1 1 1.28

CORPORATE/EXECUTIVE

AERIAL SURVEY

COMPANY FLIGHT

OTHER

COMMERCIAL

AERIAL APPLICATION

CROP CONTROL RELATED FLIGHT

FIRE CONTROL

FIRE CONTROL RELATED FLIGHT

AERIAL MAPPING/PHOTOGRAPHY

AERIAL ADVERTISING

POWER AND PIPELINE PATROL

FISH SPOTTING

AIR TAXI-PASSENGER OPERATIONS

AIR TAXI-CARGO OPERATIONS

CONSTRUCTION WORK

SCHEDULED PASSENGER SERVICE

SCHEDULED CARGO SERVICE

INTRA-STATE CHARTER PASSG.

INTRA-STATE CHARTER CARGO.

MILITARY CONTRACT-PASSENGER

MILITARY CONTRACT-CARGO

CHARTER CARGO-DOMESTIC

CHARTER PASSG-DOMESTIC

CHARTER-CARGO-INTERNATIONAL

CHARTER-PASSG-INTERNATIONAL

OTHER

UNKNOWN/NOT REPORTED

## ANALYTIC TABLE

KIND OF FLYING

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

MISCELLANEOUS

EXPERIMENTATION

TEST

1

1

1

1.28

DEMONSTRATION

FERRY

SEARCH AND RESCUE

AIR SHOW/AIR RACING

1

1

1

3

3

3.85

PARACHUTE JUMP

PARACHUTE JUMP-AIR SHOW

TOWING GLIDERS

1

1

2

2

2.56

SEEDING CLOUDS

HUNTING

POLICE PATROL

HIGHWAY TRAFFIC ADVISORY

ALL OTHER PUBLIC FLYING

OTHER

1

1

1

1.28

UNKNOWN/NOT REPORTED

RECORDS

7

13

13

45

78

ACCIDENTS

7

13

13

44

77

PERCENTS

9.0 16.7 16.7 57.7

# INJURIES, ACCIDENTS GLIDER

## INJURIES

	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	7	12	12	47		78
COPILOT						
DUAL STUDENT				3		3
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS	1		2	12		15
TOTAL	8	12	14	62	ABOARD	96
OTHER AIRCRAFT						
OTHER GROUND		1				1
GRAND TOTAL	8	13	14	62		97

INVOLVES 77 TOTAL ACCIDENTS  
INVOLVES 7 FATAL ACCIDENTS





# **COLLISIONS BETWEEN AIRCRAFT**



# ANALYTIC TABLE

## TYPE OF COLLISION (1ST) VS INJURY INDEX

FATAL  
SERIOUS  
MINOR  
NONE

BOTH IN FLIGHT

34 8 6 20

ONE AIRBORNE

2 4 4

BOTH ON GROUND

4 20

RECORDS

36 8 14 44

ACCIDENTS

18 4 7 22

PERCENTS

35.3 7.8 13.7 43.1

RECORDS ACCIDENTS PERCENT

68 34 66.67

10 5 9.80

24 12 23.53

102

51

## ANALYTIC TABLE

PHASE OF OPERATION BY INJURY INDEX  
COLLISIONSFIRST  
OPERATIONAL PHASEFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

STATIC

STARTING ENGINE/S

IDLING ENGINE/S

ENGINE RUNUP

IDLING ROTORS

PARKED-ENGINES NOT OPERATING

OTHER

TAXI

TO TAKEOFF

FROM LANDING

OTHER

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

INITIAL CLIMB

VERTICAL

RUNNING (ROTORCRAFT/VTOL-STOL)

ABORTED (FIXED-WING)

ABORTED (ROTORCRAFT/VTOL)

ABORTED (ROTORCRAFT/STOL)

OTHER

INFLIGHT

CLIMB TO CRUISE

NORMAL CRUISE

DESCENDING

HOLDING (IFR)

HOVERING

POWER-ON DESCENT (ROTORCRAFT)

AUTOROTATIVE DESCENT

ACROBATICS

BUZZING

UNCONTROLLED DESCENT

## ANALYTIC TABLE

FIRST  
OPERATIONAL PHASE

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

EMERGENCY DESCENT

LOW PASS

2

2

1

1.96

OTHER

5

5

3

4.90

EN ROUTE TO TRFAT CROP

EN ROUTE TO RELOADING AREA

SURVEY FIELD/AREA

STARTING SWATH RUN

2

2

1

1.96

SWATH RUN

FLAREOUT FOR SWATH RUN

PULLUP FROM SWATH RUN

PROCEDURE TURNAROUND

2

2

1

1.96

CLEANUP SWATH

MANEUVER TO AVOID OBSTRUCTION

RETURN TO STRIP

2

2

1

1.96

LANDING

TRAFFIC PATTERN-CIRCLING

4

4

2

3.92

FINAL APPROACH (VFR)

2

6

1

8

17

9

16.67

INITIAL APPROACH

FINAL APPROACH (IFR)

LEVEL OFF/TOUCHDOWN

5

5

10

8

9.80

ROLL (FIXED WING)

1

1

8

10

7

9.80

ROLL-ON/RUN-ON (ROTORCRAFT)

POWER-ON LANDING (ROTORCRAFT)

POWER-OFF AUTOROTATIVE LDG

GO-AROUND (VFR)

MISSED APPROACH (IFR)

OTHER

UNKNOWN/NOT REPORTED

RECORDS

36 8 14 44

102

ACCIDENTS

18 4 7 22

51

PERCENTS

35.3 7.8 13.7 43.1

CAUSE/FACTOR TABLE  
COLLISIONS  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 51 TOTAL ACCIDENTS  
INVOLVES 18 FATAL ACCIDENTS

BROAD CAUSE/FACTOR -----	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----	CAUSE -----	FACTOR -----	TOTAL* -----
PILOT	18 100.00	4 22.22	18 100.00	33 100.00	6 18.18	33 100.00	51 100.00	10 19.61	51 100.00
PERSONNEL	18 100.00	1 5.56	18 100.00	33 100.00	4 12.12	33 100.00	51 100.00	5 9.80	51 100.00
AIRFRAME	.00	.00	.00	.00	.00	.00	.00	.00	.00
LANDING GEAR	.00	.00	.00	.00	.00	.00	.00	.00	.00
POWERPLANT	.00	.00	.00	.00	.00	.00	.00	.00	.00
SYSTEMS	.00	.00	.00	.00	.00	.00	.00	.00	.00
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	1 5.56	1 5.56	.00	1 3.03	1 3.03	.00	2 3.92	2 3.92
WEATHER	.00	1 5.56	1 5.56	.00	1 3.03	1 3.03	.00	2 3.92	2 3.92
TERRAIN	.00	.00	.00	.00	.00	.00	.00	.00	.00
MISCELLANEOUS	.00	.00	.00	.00	.00	.00	.00	.00	.00
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  
COLLISIONS  
ACCIDENTS WITH ASSIGNED CAUSES ONLY  
(EXCLUDES ACCIDENTS WITHOUT CAUSAL ASSIGNMENT)

INVOLVES 51 TOTAL ACCIDENTS

INVOLVES 18 FATAL ACCIDENTS

DETAILED CAUSE/FACTOR -----	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
** PILOT **									
PILOT IN COMMAND									
DIVERTED ATTENTION FROM OPERATION OF AIRCRAFT	1		1	1		1	2		2
FAILED TO SEE AND AVOID OTHER AIRCRAFT	29		29	44	2	46	73	2	75
FAILED TO FOLLOW APPROVED PROCEDURES, DIRECTIVES ETC		4	4	2	3	5	2	7	9
INADEQUATE PREFLIGHT PREPARATION AND/OR PLANNING					3	3		3	3
INADEQUATE SUPERVISION OF FLIGHT				1		1	1		1
LACK OF FAMILIARITY WITH AIRCRAFT					2	2		2	2
EXERCISED POOR JUDGMENT	2		2				2		2
OPERATED CARELESSLY				1		1	1		1
MISJUDGED SPEED				1		1	1		1
MISJUDGED CLEARANCE	1		1	2		2	3		3
SELECTED WRONG RUNWAY RELATIVE TO EXISTING WIND		1	1					1	1
SUBTOTAL	33	5	38	52	10	62	85	15	100
DUAL STUDENT									
FAILED TO SEE OTHER AIRCRAFT				1		1	1		1
SUBTOTAL				1		1	1		1
** PERSONNEL **									
FLIGHT INSTRUCTOR									
MAINTENANCE, SERVICING, INSPECTION									
OPERATIONAL SUPERVISORY PERSONNEL									
WEATHER PERSONNEL									
TRAFFIC CONTROL PERSONNEL									
FAILURE TO ADVISE OF OTHER TRAFFIC					2	2		2	2
INADEQUATE SPACING OF AIRCRAFT					2	2		2	2
AIRPORT SUPERVISORY PERSONNEL									
AIRWAYS FACILITIES PERSONNEL									
PRODUCTION-DESIGN-PERSONNEL									
MISCELLANEOUS-PERSONNEL									
PILOT OF OTHER AIRCRAFT	30		30	47	2	49	77	2	79
OTHER		2	2					2	2
THIRD PILOT									
FLIGHT ENGINEER									
FLIGHT PERSONNEL									
DISPATCHING (AIR CARRIER ONLY)									
SUBTOTAL	30	2	32	47	6	53	77	8	85
** AIRPORTS/AIRWAYS/FACILITIES **									
AIRPORT FACILITIES									
AIRPORT CONDITIONS									
HIGH VEGETATION		2	2		2	2		4	4
AIRWAYS FACILITIES									
SUBTOTAL		2	2		2	2		4	4
** WEATHER **									
LOW CEILING					2	2		2	2
FOG					2	2		2	2
OBSTRUCTIONS TO VISION		2	2					2	2
SUBTOTAL		2	2		4	4		6	6
GRAND TOTAL	63	11	74	100	22	122	163	33	196
** MISCELLANEOUS ACTS, CONDITIONS **									



CAUSE/FACTOR TABLE

MISCELLANEOUS ACTS, CONDITIONS (CONTINUED)

DETAILED CAUSE/FACTOR	FATAL ACCIDENTS			NONFATAL ACCIDENTS			ALL ACCIDENTS		
	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL	CAUSE	FACTOR	TOTAL
DISREGARD OF GOOD OPERATING PRACTICE				1	1	2	1	1	2
NOT ALLIGNED WITH RUNWAY/INTENDED LANDING AREA				1		1	1		1
POORLY PLANNED APPROACH					1	1		1	1
WINDSHIELD, DIRTY, FOGGY, ETC-RESTRICTED VISION					1	1		1	1
CONGESTED TRAFFIC-PATTERN		2	2		4	4		6	6
SUNGLARE		2	2		3	3		5	5
AIRCRAFT CAME TO REST IN WATER		1	1					1	1
TOUCH AND GO LANDING					2	2		2	2

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

## ANALYTIC TABLE

KIND OF FLYING BY INJURY INDEX  
COLLISIONS

<u>KIND OF FLYING</u>	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>INSTRUCTIONAL</u>							
DUAL	3	2	2	7	14	12	13.73
SOLO	1			3	4	4	3.92
CHECK							
TRAINING		1		1	2	2	1.96
<u>NONCOMMERCIAL</u>							
PLEASURE	18	1	10	15	44	30	43.14
PRACTICE	1	1		4	6	6	5.88
BUSINESS	4	1		2	7	7	6.86
CORPORATE/EXECUTIVE	1				1	1	.98
AERIAL SURVEY							
COMPANY FLIGHT							
OTHER							
<u>COMMERCIAL</u>							
AERIAL APPLICATION	2	2		2	6	3	5.88
CROP CONTROL RELATED FLIGHT	2			1	3	2	2.94
FIRE CONTROL							
FIRE CONTROL RELATED FLIGHT							
AERIAL MAPPING/PHOTOGRAPHY							
AERIAL ADVERTISING							
POWER AND PIPELINE PATROL							
FISH SPOTTING							
AIR TAXI-PASSENGER OPERATIONS	1			1	2	2	1.96
AIR TAXI-CARGO OPERATIONS				1	1	1	.98
CONSTRUCTION WORK							
SCHEDULED PASSENGER SERVICE							
SCHEDULED CARGO SERVICE							
INTRA-STATE CHARTER PASSG.							
INTRA-STATE CHARTER CARGO.							
MILITARY CONTRACT-PASSENGER							
MILITARY CONTRACT-CARGO							
CHARTER CARGO-DOMESTIC							
CHARTER PASSG-DOMESTIC							
CHARTER-CARGO-INTERNATIONAL							
CHARTER-PASSG-INTERNATIONAL							
OTHER			2		2	1	1.96
UNKNOWN/NOT REPORTED							

## ANALYTIC TABLE

KIND OF FLYING

FATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

MISCELLANEOUS

EXPERIMENTATION

TEST

DEMONSTRATION

FERRY

SEARCH AND RESCUE

AIR SHOW/AIR RACING

PARACHUTE JUMP

PARACHUTE JUMP-AIR SHOW

TOWING GLIDERS

SEEDING CLOUDS

HUNTING

POLICE PATROL

ALL OTHER PUBLIC FLYING

OTHER

UNKNOWN/NOT REPORTED

RECORDS

ACCIDENTS

PERCENTS

36 8 14 44  
18 4 7 22  
35.3 7.8 13.7 43.1

102

51

## ANALYTIC TABLE

KIND OF FLYING BY AIRCRAFT DAMAGE  
COLLISIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
<u>INSTRUCTIONAL</u>							
DUAL	3	10		1	14	12	13.73
SOLO	1	3			4	4	3.92
CHECK							
TRAINING		2			2	2	1.96
<u>NONCOMMERCIAL</u>							
PLEASURE	14	25	5		44	30	43.14
PRACTICE	1	2	2	1	6	6	5.88
BUSINESS	4	2	1		7	7	6.86
CORPORATE/EXECUTIVE			1		1	1	.98
AERIAL SURVEY							
COMPANY FLIGHT							
OTHER							
<u>COMMERCIAL</u>							
AERIAL APPLICATION	4	2			6	3	5.88
CROP CONTROL RELATED FLIGHT	1	2			3	2	2.94
FIRE CONTROL							
FIRE CONTROL RELATED FLIGHT							
AERIAL MAPPING/PHOTOGRAPHY							
AERIAL ADVERTISING							
POWER AND PIPELINE PATROL							
FISH SPOTTING							
AIR TAXI-PASSENGER OPERATIONS	1	1			2	2	1.96
AIR TAXI-CARGO OPERATIONS			1		1	1	.98
CONSTRUCTION WORK							
SCHEDULED PASSENGER SERVICE							
SCHEDULED CARGO SERVICE							
INTRA-STATE CHARTER PASSG.							
INTRA-STATE CHARTER CARGO.							
MILITARY CONTRACT-PASSENGER							
MILITARY CONTRACT-CARGO							
CHARTER CARGO-DOMESTIC							
CHARTER PASSG-DOMESTIC							
CHARTER-CARGO-INTERNATIONAL							
CHARTER-PASSG-INTERNATIONAL							
OTHER	1	1			2	1	1.96
UNKNOWN/NOT REPORTED							

## ANALYTIC TABLE

DESTROYED  
SUBSTANTIAL  
MINOR  
NONE

MISCELLANEOUS

EXPERIMENTATION

TEST 2

RECORDS ACCIDENTS PERCENT

2 2 1.96

DEMONSTRATION

FERRY 1 4

5 4 4.90

SEARCH AND RESCUE

AIR SHOW/AIR RACING 2

2 1 1.96

PARACHUTE JUMP

PARACHUTE JUMP-AIR SHOW

TOWING GLIDERS

SEEDING CLOUDS

HUNTING

POLICE PATROL

HIGHWAY TRAFFIC ADVISORY

ALL OTHER PUBLIC FLYING 1

1 1 .98

OTHER

UNKNOWN/NOT REPORTED

RECORDS 31 59 10 2

102

ACCIDENTS 21 39 10 2

51

PERCENTS 30.4 57.8 9.8 2.0

## ANALYTIC TABLE

SEGMENTS OF AVIATION BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
SML US GEN AVN-COLLISION SAME	34	8	14	43	100	49	57.06
SML US GEN AVN-LRG US GEN AVN	2				2	1	1.96
SML US GEN AVN-US AIR CARRIER							
SML US GEN AVN-US MILITARY							
SML US GEN AVN-Foreign GEN AV				1		1	.98
SML US GEN AVN-Foreign ACR							
SML US GEN AVN-Foreign MIL							
LRG US GEN AVN-COLLISION SAME							
LRG US GEN AVN-US AIR CARRIER							
LRG US GEN AVN-US MILITARY							
LRG US GEN AVN-Foreign GEN AV							
LRG US GEN AVN-Foreign ACR							
LRG US GEN AVN-Foreign MIL							
US AIR CARRIER-US AIR CARRIER							
U.S. AIR CARRIER-U.S. MILITARY							
US ACR-Foreign GEN AVIATION							
US AIR CARRIER-Foreign ACR							
US AIR CARRIER-Foreign MIL							
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		31	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

PILOT AGE BY INJURY INDEX  
COLLISIONSFATAL  
SERIOUS  
MINOR  
NONE

RECORDS ACCIDENTS PERCENT

16		1			1	1	.98
17	1				1	1	.98
18			1		1	1	.98
19			1		1	1	.98
21	1		1		2	2	1.96
22	1		1		2	2	1.96
23			2		2	2	1.96
24		2	1		3	3	2.94
25		1			1	1	.98
26			1		1	1	.98
27	1		1	1	3	3	2.94
28	4	1	1		6	6	5.88
29	2		2	2	6	6	5.88
30	2		2		4	4	3.92
31			1		1	1	.98
32			2		2	2	1.96
33	2		3		5	4	4.90
34	1		3		4	4	3.92
35	1				1	1	.98
36	1		1		2	2	1.96
37			1		1	1	.98
38	1	1	3		5	5	4.90
39	1		1		2	2	1.96
41		2	2		4	4	3.92
42			1		1	1	.98
43		1			1	1	.98
45	2		2		4	4	3.92
47	3				3	3	2.94
48		1			1	1	.98
49	3	1			4	3	3.92
50			2		2	2	1.96
51	1		1		2	2	1.96
52			1	2	3	3	2.94
53	1		1		2	2	1.96
54	1		1		2	2	1.96
55			2		2	2	1.96
56			1		1	1	.98

# ANALYTIC TABLE

Pilot age	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
57	1	2			3	3	2.94
58	2	1			3	3	2.94
59			2		2	2	1.96
60	1				1	1	.98
61		1			1	1	.98
65	1				1	1	.98
66	1				1	1	.98
Unknown			1		1	1	.98
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	27		51	
PERCENTS	35.3	7.8	13.7	43.1			



## ANALYTIC TABLE

PILOT CERTIFICATE BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
STUDENT	1	1		4	6	6	5.88
PRIVATE	15	3	8	15	41	31	40.20
COMMERCIAL	8	2	3	15	28	23	27.45
AIRLINE TRANSPORT	2		1	2	5	5	4.90
PRIVATE W/FLIGHT INSTRUCTOR							
COML WITH FLT INSTRUCTOR	9	2	2	7	20	16	19.61
ATR W/FLIGHT INSTRUCTOR	1			1	2	2	1.96
OTHER							
NONE							
UNKNOWN/NOT REPORTED							
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

PILOT CERTIFICATE BY TYPE OF WEATHER CONDITIONS  
COLLISIONS

	STUDENT	PRIVATE	COMMERCIAL	ATR	PRIVATE/ FL INSTR.	COMMERCIAL/ FL INSTR.	ATR/ FL INSTR.	OTHER	NONE	UNKNOWN/ NOT REPORTED	RECORDS	ACCIDENTS	PERCENT
VFR	6	41	27	4	20	2					100	50	98.04
IFR			1	1							2	1	1.96
BELOW MINIMUMS													
UNKNOWN/NOT REPORTED													
RECORDS	6	41	28	5	20	2					102		
ACCIDENTS	6	31	23	5	16	2						51	
PERCENTS	5.9	40.2	27.5	4.9	19.6	2.0	.0	.0	.0	.0			

## ANALYTIC TABLE

MONTH OF OCCURRENCE BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
01	2	2	2	4	10	5	9.80
02							
03	2			4	6	3	5.88
04	6			4	10	5	9.80
05	2			8	10	5	9.80
06	4				4	2	3.92
07	2		2	2	6	3	5.88
08	6		4	4	14	7	13.73
09	4	2	2		8	4	7.84
10	2	2		6	10	5	9.80
11	2		2	8	12	6	11.76
12	4	2	2	4	12	6	11.76
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

MONTH OF OCCURRENCE BY AIRCRAFT DAMAGE  
COLLISIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
01	2	5	2	1	10	5	9.80
02							
03	2	4			6	3	5.88
04	4	6			10	5	9.80
05	1	8		1	10	5	9.80
06	3		1		4	2	3.92
07	3	3			6	3	5.88
08	4	10			14	7	13.73
09	3	4	1		8	4	7.84
10	3	5	2		10	5	9.80
11	1	9	2		12	6	11.76
12	5	5	2		12	6	11.76
RECORDS	31	59	10	2	102		
ACCIDENTS	21	39	10	2		51	
PERCENTS	30.4	57.8	9.8	2.0			

## ANALYTIC TABLE

STATE OF OCCURRENCE BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
ALASKA	2		2		4	2	3.92
ARIZONA	2				2	1	1.96
ARKANSAS	2				2	1	1.96
CALIFORNIA	10		8		18	9	17.65
COLORADO	2				2	1	1.96
CONNECTICUT			2		2	1	1.96
FLORIDA			6		6	3	5.88
HAWAII		2			2	1	1.96
ILLINOIS		4			4	2	3.92
INDIANA	2	2			4	2	3.92
MINNESOTA			2		2	1	1.96
MISSISSIPPI	2				2	1	1.96
MISSOURI			2		2	1	1.96
NEVADA			2		2	1	1.96
NEW YORK	2		2		4	2	3.92
NORTH CAROLINA		2			2	1	1.96
OHIO			2		2	1	1.96
OREGON			4		4	2	3.92
PENNSYLVANIA	2				2	1	1.96
SOUTH DAKOTA	2				2	1	1.96
TENNESSEE			2		2	1	1.96
TEXAS	6	6	2	8	22	11	21.57
VIRGINIA		2		4	6	3	5.88
WISCONSIN	2				2	1	1.96
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

STATE OF OCCURRENCE BY AIRCRAFT DAMAGE  
COLLISIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
ALASKA	1	2	1		4	2	3.92
ARIZONA	2				2	1	1.96
ARKANSAS	1	1			2	1	1.96
CALIFORNIA	9	9			18	9	17.65
COLORADO	2				2	1	1.96
CONNECTICUT		2			2	1	1.96
FLORIDA		3	2	1	6	3	5.88
HAWAII		1	1		2	1	1.96
ILLINOIS	1	3			4	2	3.92
INDIANA	2	2			4	2	3.92
MINNESOTA		2			2	1	1.96
MISSISSIPPI	2				2	1	1.96
MISSOURI		2			2	1	1.96
NEVADA		1	1		2	1	1.96
NEW YORK	1	3			4	2	3.92
NORTH CAROLINA		2			2	1	1.96
OHIO		2			2	1	1.96
OREGON		2	1	1	4	2	3.92
PENNSYLVANIA	2				2	1	1.96
SOUTH DAKOTA		2			2	1	1.96
TENNESSEE		1	1		2	1	1.96
TEXAS	6	13	3		22	11	21.57
VIRGINIA	1	5			6	3	5.88
WISCONSIN	1	1			2	1	1.96
RECORDS	31	59	10	2	102		
ACCIDENTS	21	39	10	2		51	
PERCENTS	30.4	57.8	9.8	2.0			

## ANALYTIC TABLE

TYPE OF AIRCRAFT BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
FIXED-WING	35	8	14	41	98	50	96.08
HELICOPTER	1			1	2	2	1.96
GLIDER				2	2	1	1.96
BALLOON							
BLIMP							
DIRIGIBLE							
ROCKET							
CONVERTIPLANE							
GYROPLANE							
OTHER							
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

TYPE AIRCRAFT BY AIRCRAFT DAMAGE  
COLLISIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
FIXED-WING	31	58	8	1	98	50	96.08
HELICOPTER			1	1	2	2	1.96
GLIDER		1	1		2	1	1.96
BALLOON							
BLIMP							
DIRIGIBLE							
ROCKET							
CONVERTIPLANE							
GYROPLANE							
OTHER							
RECORDS	31	59	10	2	102		
ACCIDENTS	21	39	10	2		51	
PERCENTS	30.4	57.8	9.8	2.0			

## ANALYTIC TABLE

TYPE OF POWER BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
RECIPROCATING ENGINE	34	8	14	40	96	50	94.12
TURBOJET ENGINE							
TURBOPROP ENGINE	1			1	2	2	1.96
TURBOFAN ENGINE							
NONE				2	2	1	1.96
TURBOSHAFT	1			1	2	2	1.96
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

TYPE POWER BY AIRCRAFT DAMAGE  
COLLISIONS

	DESTROYED	SUBSTANTIAL	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
RECIPROCATING ENGINE	30	57	8	1	96	50	94.12
TURBOJET ENGINE							
TURBOPROP ENGINE	1	1			2	2	1.96
TURBOFAN ENGINE							
NONE			1	1	2	1	1.96
TURBOSHAFT				1	2	2	1.96
RECORDS	31	59	10	2	102		
ACCIDENTS	21	39	10	2		51	
PERCENTS	30.4	57.8	9.8	2.0			

## ANALYTIC TABLE

TYPE OF FLIGHT PLAN BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
NONE	31	8	13	35	87	47	85.29
VFR	4		1	6	11	8	10.78
IFR	1			2	3	2	2.94
CONTROLLED VFR							
IFR (VFR CONDITIONS ON TOP)							
TOWER EN ROUTE CONTROL SERVICE							
OVFR							
VFR FLIGHT FOLLOWING SERVICE							
SPECIAL VFR							
OTHER							
UNKNOWN/NOT REPORTED				1	1	1	.98
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

TYPE OF WEATHER CONDITIONS BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
VFR	36	8	14	42	100	50	98.04
IFR				2	2	1	1.96
BELOW MINIMUMS							
UNKNOWN/NOT REPORTED							
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

AIRPORT PROXIMITY BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
ON AIRPORT	6	6	12	32	56	28	54.90
ON SEAPLANE BASE							
ON HELIPORT							
ON BARGE/SHIP/PLATFORM							
IN TRAFFIC PATTERN	4			3	7	4	6.86
WITHIN 1/4 MILE	2			2	4	2	3.92
WITHIN 1/2 MILE				3	3	2	2.94
WITHIN 3/4 MILE							
WITHIN 1 MILE							
WITHIN 2 MILES	1				1	1	.98
WITHIN 3 MILES	3				3	2	2.94
WITHIN 4 MILES	2				2	1	1.96
WITHIN 5 MILES	4				4	2	3.92
BEYOND 5 MILES	12	2	2	2	18	9	17.65
UNKNOWN/NOT REPORTED	2			2	4	2	3.92
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

## ANALYTIC TABLE

CONTROLLED/UNCONTROLLED AIRPORT BY INJURY INDEX  
COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
CONTROLLED AIRPORT	3			6	9	5	15.52
UNCONTROLLED AIRPORT	12	6	8	23	49	25	84.48
RECORDS	15	6	8	29	58		
ACCIDENTS	8	3	4	15		30	
PERCENTS	25.9	10.3	13.8	50.0			



# ANALYTIC TABLE

## CONDITIONS OF LIGHT BY INJURY INDEX COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
DAWN							
DAYLIGHT	36	6	14	36	92	46	90.20
DUSK		2			2	1	1.96
NIGHT (DARK)				8	8	4	7.84
NIGHT (MOONLIGHT-BRIGHT)							
UNKNOWN/NOT REPORTED							
RECORDS	36	8	14	44	102		
ACCIDENTS	18	4	7	22		51	
PERCENTS	35.3	7.8	13.7	43.1			

# ANALYTIC TABLE

## FIRE AFTER IMPACT BY INJURY INDEX COLLISIONS

	FATAL	SERIOUS	MINOR	NONE	RECORDS	ACCIDENTS	PERCENT
YES	6	2			8	5	100.00
UNKNOWN/NOT REPORTED							
RECORDS	6	2			8		
ACCIDENTS	4	1				5	
PERCENTS	75.0	25.0					

# INJURIES, ACCIDENTS COLLISIONS

	INJURIES					TOTAL
	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	
PILOT	25	6	10	61		102
COPILOT	4			2		6
DUAL STUDENT	1		2	12		15
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW	1			1		2
PASSENGERS	11	1	5	24		41
TOTAL	42	7	17	100	ABOARD	166
OTHER AIRCRAFT						
OTHER GROUND						
GRAND TOTAL	42	7	17	100		166

INVOLVES 51 TOTAL ACCIDENTS  
INVOLVES 18 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
BOTH AIRCRAFT AIRBORNE  
COLLISIONS

		INJURIES						
		FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL	
PILOT		24	6	7	31			68
COPILOT		4						4
DUAL STUDENT		1		2	9			12
CHECK PILOT								
FLIGHT ENGINEER								
NAVIGATOR								
CABIN ATTENDANT								
EXTRA CREW		1						1
PASSENGERS		11		2	11			24
TOTAL		41	6	11	51		ABOARD	109
OTHER AIRCRAFT								
OTHER GROUND								
GRAND TOTAL		41	6	11	51			109

INVOLVES 34 TOTAL ACCIDENTS  
INVOLVES 17 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
ONE AIRCRAFT AIRBORNE  
COLLISIONS

INJURIES

	FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT	1		1	8		10
COPILOT				1		1
DUAL STUDENT				1		1
CHECK PILOT						
FLIGHT ENGINEER						
NAVIGATOR						
CABIN ATTENDANT						
EXTRA CREW						
PASSENGERS		1	2	6		9
TOTAL	1	1	3	16	ABOARD	21

OTHER AIRCRAFT  
OTHER GROUND

GRAND TOTAL 1 1 3 16 21

INVOLVES 5 TOTAL ACCIDENTS  
INVOLVES 1 FATAL ACCIDENTS

INJURIES, ACCIDENTS  
COLLISIONS  
BOTH AIRCRAFT ON GROUND

INJURIES					
FATAL	SERIOUS	MINOR	NONE	UNKNOWN	TOTAL
PILOT		2	22		24
COPILOT			1		1
DUAL STUDENT			2		2
CHECK PILOT					
FLIGHT ENGINEER					
NAVIGATOR					
CABIN ATTENDANT					
EXTRA CREW			1		1
PASSENGERS		1	7		8
TOTAL		3	33	ABOARD	36
OTHER AIRCRAFT					
OTHER GROUND					
GRAND TOTAL		3	33		36

INVOLVES 12 TOTAL ACCIDENTS  
INVOLVES FATAL ACCIDENTS

## **YEARLY ACCIDENT RECORD**



ACCIDENTS, FATALITIES, RATES  
U. S. GENERAL AVIATION

1968 - 1977

Year	Accidents		Fatalities	Aircraft- Hours Flown (000) c/	Aircraft- Miles Flown (000) c/	Accident Rates			
	Total	Fatal				Per 100,000 Aircraft- Hours Flown		Per Million Aircraft- Miles Flown	
						Total	Fatal	Total	Fatal
1968	4,968 <u>a/</u>	692 <u>a/</u>	1,399	24,053	3,700,864	20.6	2.86	1.34	0.186
1969	4,767	647	1,495 <u>b/</u>	25,351	3,926,461	18.8	2.55	1.21	0.164
1970	4,712 <u>a/</u>	641 <u>a/</u>	1,310	26,030	3,207,127 <u>d/</u>	18.1	2.46	1.47	0.200
1971	4,648	661	1,355	25,512	3,143,181	18.2	2.59	1.48	0.211
1972	4,256 <u>a/</u>	695 <u>a/</u>	1,426 <u>b/</u>	26,974	3,317,100	15.8	2.57	1.28	0.209
1973	4,255 <u>a/</u>	723 <u>a/</u>	1,412	30,048	3,728,500	14.2	2.40	1.14	0.193
1974	4,425 <u>a/</u>	729 <u>a/</u>	1,438	32,475	4,042,700	13.6	2.24	1.04	0.180
1975	4,237 <u>a/</u>	675 <u>a/</u>	1,345	34,165	4,238,400	12.4	1.97	1.00	0.159
1976	4,193	695	1,320	36,128	4,476,014	11.6	1.92	0.94	0.155
1977	4,286	702	1,436	38,600	4,786,400	11.1	1.82	0.90	0.147

a/ Suicide/sabotage accidents included in all computations except rates (1968-3, 1970-1, 1972-3, 1973-2, 1974-2, 1975-2, 1976-4, 1977-1).

b/ Includes air carrier fatalities - - - 1967-104, 1969-82, 1972-5) when in collision with general aviation aircraft.

c/ Source: FAA

d/ Beginning in 1970, the decrease in aircraft-miles flown is the result of a change in the FAA standard for estimating miles flown.





## EXPLANATORY NOTES



## EXPLANATORY NOTES

### GENERAL AVIATION

General Aviation refers to the operation of U.S. Civil Aircraft owned and operated by persons, corporations, etc., other than those engaged in U.S. air carrier operations. (U.S. air carrier operations include the certificated route air carriers, supplemental air carriers, and commercial operators of large aircraft).

### AIRCRAFT ACCIDENT

The accidents included herein are the occurrences incident to flight in which, "as a result of the operation of an aircraft, any person (occupant or nonoccupant) receives fatal or serious injury or any aircraft receives substantial damage." The definition of substantial damage is:

- (1) Except as provided in subparagraph (2) of this paragraph, substantial damage means damage or structural failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component.
- (2) Engine failure, damage limited to an engine, bent fairings or cowlings, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, damage to landing gear, wheels, tires, flaps engine accessories, brakes, or wingtips are not considered "substantial damage" for this part.

### INJURY INDEX

Injury index refers to the highest degree of personal injury sustained as a result of the accident.

### FATAL INJURY

Any injury which results in death within 7 days of the accident.

### SERIOUS INJURY

Any injury which 1) requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; 2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); 3) involves lacerations which cause severe hemorrhages, nerve, muscle, or tendon damage; 4) involves injury to any internal organ; or 5) involves second- or third-degree burns, or any burns affecting more than 5 percent of body surface.

## EXPLANATORY NOTES

### TYPE OF ACCIDENT

Type of accident relates to the immediate circumstances of the occurrence. Many accidents involve a series of circumstances and therefore require a second type to more fully describe the sequence of events. The fold out page shows the relationship of first and second accidents types. Some examples of types of accidents are as follows:

#### Gear Collapsed

Collapse of the landing gear due to mechanical failure other than a malfunction of the retracting mechanism.

#### Gear Retracted

Retraction of the landing gear due to malfunction or failure of the retracting mechanism or to inadvertent retraction by the crew. Excludes intentional gear retraction and wheels-up landing.

#### Airframe Failure

Occurrences resulting from failure of any part of the airframe while in flight or in motion on the ground. Excludes failure resulting from contact with another airplane or object, or impact with the ground, or damage from landing gear collapse or retraction.

#### Engine Failure/Malfunction

Occurrences of engine failure or malfunction for any reason. Includes engine stoppage, power interruption or power loss.

### PHASE OF OPERATION

The phase of operation relates to the particular segment of the flight or operation during which the circumstances of the accident occur.

### KIND OF FLYING

Refers to the purpose for which the aircraft is being operated at the time of the accident. There are four broad categories of kind of flying.

#### 1. Instructional Flying

Refers to flying accomplished in supervised training under the direction of an accredited instructor.

## EXPLANATORY NOTES

### COLLISION BETWEEN BETWEEN AIRCRAFT

and coded, thus two aircraft accident records are produced -- one for each aircraft. These records contain the same broad categories of coded data; however, the specific entries, such as type of aircraft, kind of flying, and phase of operation, may not be common to each aircraft. As a result, the number of accidents may differ in the various tables depending on whether collisions are involved. If collisions are involved, the number of accidents would depend on whether the selected data are common to each aircraft. For example, in a table which shows the number of accidents in the various kinds of flying, if each of the colliding aircraft was conducting pleasure flying, one accident would appear in the pleasure flying column. However, if one aircraft was engaged in pleasure flying and the other was conducting dual instruction, the accident would appear twice -- in the pleasure flying column and in the dual instruction column.

### 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-effect relationships in the accident sequence about which something can be done to prevent recurrence of the type of accident under consideration. 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/related factor tables, the figures shown in the columns dealing with cause may exceed the total number of accidents. The term "factor" is used, in general, to denote those elements of an accident which further explain or supplement the probable cause(s). This provision was incorporated in the coding system to increase flexibility and to provide a means for collecting essential items of information which could not be readily categorized elsewhere in the system.

The number of total accidents and fatal accidents shown in the cause/factor tables may not agree with the number of total accidents or fatal accidents in other tables covering the same basic aircraft category or operational segment of General Aviation. This is because accidents that occurred on foreign soil were investigated and analyzed for cause by the government of the country involved, and in many cases the final report has been received. All accidents awaiting final causal determination were excluded from the cause/factor tables.

### AIRCRAFT WEIGHT CATEGORIES

The International Civil Aviation Organization's categories of aircraft weight are utilized to classify accident data as follows:

0 -	2,250 kilograms	(0 -	4,960 pounds)
2,251 -	5,700 kilograms	(4,961 -	12,565 pounds)
5,701 -	27,000 kilograms	(12,566 -	59,525 pounds)
27,001 -	272,000 kilograms	(59,526 -	599,650 pounds)
272,001 -	kilograms and greater	(599,651 pounds and greater)	

## EXPLANATORY NOTES

### SMALL FIXED-WING AIRCRAFT

Fixed-wing aircraft which have a maximum gross takeoff weight of 5700 kilograms (12,565 pounds), or less.

### LARGE FIXED-WING AIRCRAFT

Fixed-Wing aircraft which have a maximum takeoff weight greater than 5,700 kilograms (12,565 pounds).

### ROTORCRAFT

Aircraft which in all usual flight attitudes are supported in the air wholly or in part by a rotor or rotors; i.e., by airfoils rotating or revolving about an axis.

### TYPES OF WEATHER CONDITIONS

The types of weather conditions (VFR/IFR) are determined in accordance with the prescribed minima in Part 91 of the Federal Aviation Regulations. These minima pertain to the ceiling and visibility, in conjunction with the type of airspace, at the accident site. Type of weather conditions are based on surface weather as determined from officially recognized sources. Weather conditions encountered in flight are not necessarily representative of the classifications VFR/IFR as carried under Type of Weather Conditions.

### ABBREVIATIONS

#### AIRCRAFT

SFW - Small Fixed-Wing  
LFW - Large Fixed-Wing  
ROTOR - Rotorcraft

#### ENGINES

SE - Single Engine  
ME - Multiengine

#### AIRCRAFT DAMAGE

DEST - Destroyed  
SUBST - Substantial

### WEATHER CONDITIONS AND/OR TYPE OF FLIGHT PLAN

VFR - Visual Flight Rules  
IFR - Instrument Flight Rules  
DVFR - Defense Visual Flight Rules

## EXPLANATORY NOTES

### ABBREVIATIONS

### MISCELLANEOUS

EST - Estimated  
FAA - Federal Aviation Administration  
FAR - Federal Aviation Regulations  
NA - Not Available  
PASSG - Passenger  
UNK - Unknown

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