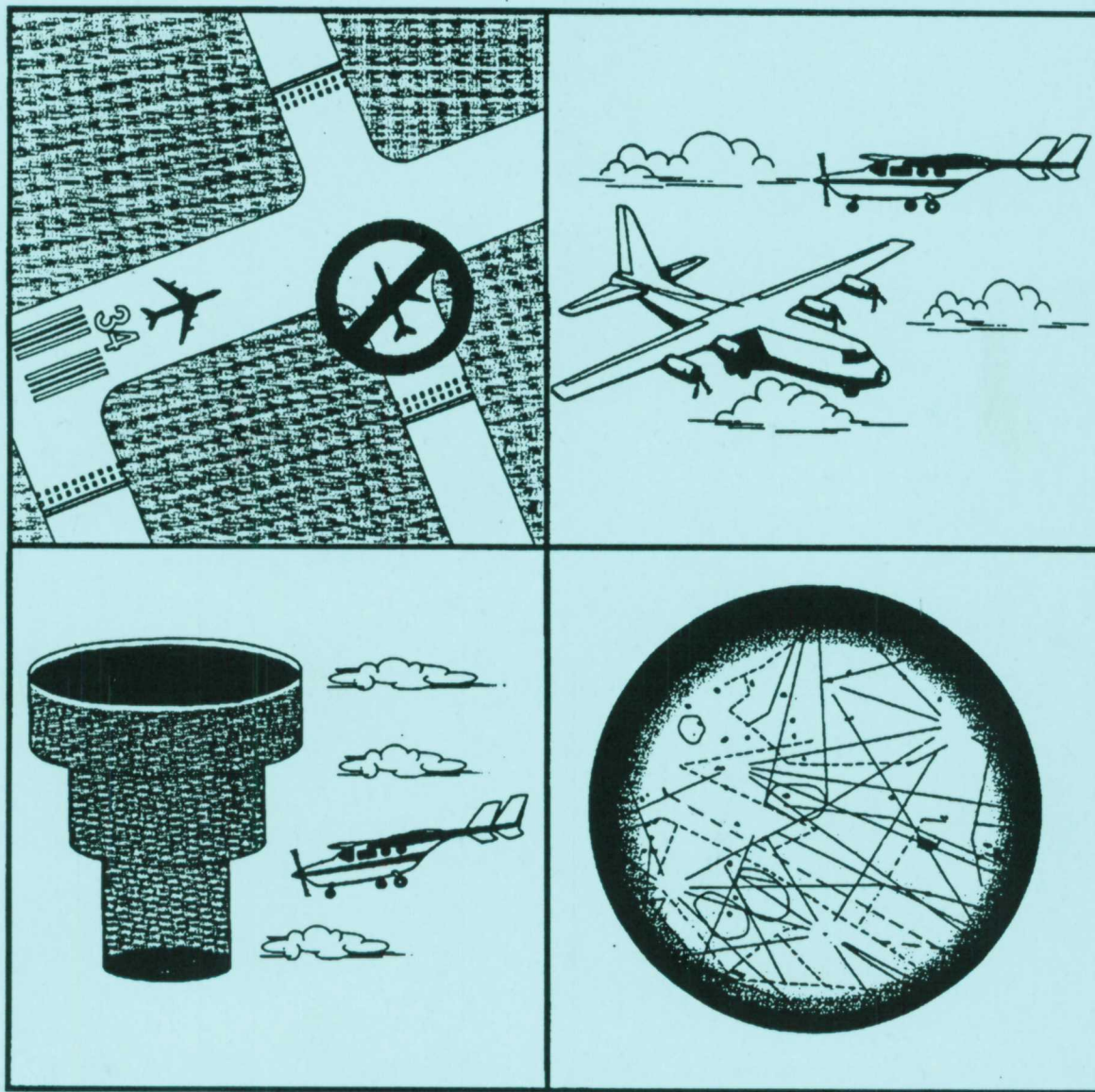




U.S. Department  
of Transportation  
Federal Aviation  
Administration

# Aviation Safety Statistical Handbook

## 1993 Annual Report



January 1994

Associate Administrator for Aviation Safety  
Office of Safety Information and Promotion

**AVIATION SAFETY STATISTICAL HANDBOOK  
1993 ANNUAL REPORT**

**TABLE OF CONTENTS**

|                                |             |
|--------------------------------|-------------|
| <b>EXECUTIVE SUMMARY .....</b> | <b>ES-1</b> |
|--------------------------------|-------------|

**Exhibits**

|                                           |             |
|-------------------------------------------|-------------|
| <b>Calendar Years 1992 and 1993 .....</b> | <b>ES-4</b> |
|-------------------------------------------|-------------|

**1.0 NEAR MIDAIR COLLISIONS**

**Exhibits**

|                                                                             |            |
|-----------------------------------------------------------------------------|------------|
| <b>Pilot Reported NMACs by Year 1988 thru 1993 .....</b>                    | <b>1-1</b> |
| <b>Pilot Reported NMACs by Reporting Operator Type 1988 thru 1993 .....</b> | <b>1-2</b> |
| <b>Pilot Reported NMACs by Type of Flight Plan 1988 thru 1993 .....</b>     | <b>1-3</b> |
| <b>Comparison of NMACs by Operator Type 1988 thru 1993 .....</b>            | <b>1-4</b> |
| <b>Pilot Reported NMACs by Degree of Hazard 1988 thru 1993 .....</b>        | <b>1-5</b> |
| <b>Pilot Reported NMACs by Region 1988 thru 1993 .....</b>                  | <b>1-6</b> |
| <b>Pilot Reported NMACs by State 1988 thru 1993 .....</b>                   | <b>1-7</b> |

**2.0 OPERATIONAL ERRORS/DEVIATIONS**

**Exhibits**

|                                                                             |             |
|-----------------------------------------------------------------------------|-------------|
| <b>Operational Errors by Year 1988 thru 1993 .....</b>                      | <b>2-1</b>  |
| <b>Operational Errors by Facility Type 1988 thru 1993 .....</b>             | <b>2-2</b>  |
| <b>Operational Error Rates by Facility Type 1988 thru 1993 .....</b>        | <b>2-3</b>  |
| <b>Top ARTCC Error Rates 1988 thru 1993 .....</b>                           | <b>2-4</b>  |
| <b>Top TRACON Error Rates 1988 thru 1993 .....</b>                          | <b>2-5</b>  |
| <b>Top Error Rates for Terminals by Facility Level 1992 thru 1993 .....</b> | <b>2-6</b>  |
| <b>Operational Errors by Region 1988 thru 1993 .....</b>                    | <b>2-8</b>  |
| <b>Operational Deviations by Year 1988 thru 1993 .....</b>                  | <b>2-9</b>  |
| <b>Operational Deviations by Facility Type 1988 thru 1993 .....</b>         | <b>2-10</b> |



### **3.0 PILOT DEVIATIONS**

#### **Exhibits**

|                                                                                  |     |
|----------------------------------------------------------------------------------|-----|
| <i>Pilot Deviations by Year 1988 thru 1993</i> .....                             | 3-1 |
| <i>Pilot Deviations by Deviation Type 1988 thru 1993</i> .....                   | 3-2 |
| <i>Pilot Deviations by Type of Airspace Violations 1988 thru 1993</i> .....      | 3-3 |
| <i>Pilot Deviations by Causal Factors - Weather 1992 thru 1993</i> .....         | 3-4 |
| <i>Pilot Deviations by Causal Factors - Equipment 1992 thru 1993</i> .....       | 3-5 |
| <i>Pilot Deviations by Causal Factors - Pilot Knowledge 1992 thru 1993</i> ..... | 3-6 |
| <i>Pilot Deviations by Causal Factors - Operational 1992 thru 1993</i> .....     | 3-7 |
| <i>Pilot Deviations by Region 1988 thru 1993</i> .....                           | 3-8 |

### **4.0 VEHICLE/PEDESTRIAN DEVIATIONS**

#### **Exhibits**

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| <i>Vehicle/Pedestrian Deviations by Year 1988 thru 1993</i> .....   | 4-1 |
| <i>Vehicle/Pedestrian Deviations by Type 1988 thru 1993</i> .....   | 4-2 |
| <i>Vehicle/Pedestrian Deviations by Region 1988 thru 1993</i> ..... | 4-3 |

### **5.0 RUNWAY INCURSIONS**

#### **Exhibits**

|                                                               |     |
|---------------------------------------------------------------|-----|
| <i>Runway Incursions by Year 1988 thru 1993</i> .....         | 5-1 |
| <i>Runway Incursions by Type 1988 thru 1993</i> .....         | 5-2 |
| <i>Runway Incursions by Top Airports 1988 thru 1993</i> ..... | 5-3 |
| <i>Runway Incursions by Airport 1992 thru 1993</i> .....      | 5-4 |

### **6.0 ACCIDENT DATA**

#### **Exhibits**

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| <i>Total System Accident Data by Year 1988 thru 1993</i> .....    | 6-1 |
| <i>Total System Accident Data by Segment 1988 thru 1993</i> ..... | 6-2 |
| <i>Total System Accident Data by Segment 1988 thru 1993</i> ..... | 6-3 |

|                                        |     |
|----------------------------------------|-----|
| <b>APPENDIX: HISTORICAL DATA</b> ..... | A-1 |
|----------------------------------------|-----|

|                                                           |     |
|-----------------------------------------------------------|-----|
| <b>APPENDIX: AVIATION SAFETY HOTLINE STATISTICS</b> ..... | A-5 |
|-----------------------------------------------------------|-----|

|                                        |      |
|----------------------------------------|------|
| <b>ACRONYM/ABBREVIATION LIST</b> ..... | A-16 |
|----------------------------------------|------|

|                       |     |
|-----------------------|-----|
| <b>GLOSSARY</b> ..... | G-1 |
|-----------------------|-----|

## **EXECUTIVE SUMMARY**



## EXECUTIVE SUMMARY

This report is the first annual edition of aviation safety statistical information for national airspace incidents and accidents. Data in tabular and graphical format are presented for near midair collisions (NMACs), operational errors (OEs), operational deviations (ODs), pilot deviations (PDs), vehicle/pedestrian deviations (VPDs), runway incursions (RIs), and aircraft accidents. Most of the major incident categories, except operational errors, total system accidents, and accident rates improved from 1992 to 1993. The report also shows some trend information for the period 1988 to 1993. Finally, some pre-1988 information is presented in the appendix.

Highlights from each section follow:

### NEAR MIDAIR COLLISIONS

Pilot reported near midair collisions (NMACs) dropped 9 percent from 311 in 1992 to 283 in 1993. NMACs reported by air carriers (Part 121 and Part 135) also declined 8 percent from 120 to 111, while those reported by General Aviation fell by one quarter from 100 to 76. However, Military reported NMACs increased slightly (about 4 percent) from 84 to 87. The number of NMACs where one aircraft was flying IFR and the other VFR decreased 12 percent from 172 to 151, those where both aircraft were flying VFR declined 7 percent from 115 to 107, and those where both aircraft were flying IFR were virtually unchanged at 25.

Over the past six years beginning in 1988, pilot reported NMACs have experienced a downward trend. For this period, pilot reported NMACs fell each year for a total of 60 percent from 710 to 283. NMACs reported by air carriers dropped 59 percent from 271 to 111, General Aviation reported NMACs fell about 70 percent from 255 to 76, and Military NMACs declined about half (52 percent) from 181 to 87. The number of NMACs where one aircraft was flying IFR and the other VFR decreased about 66 percent (from 449 to 151), those where both aircraft were flying VFR dropped 47 percent (from 203 to 107), and those where both aircraft were flying IFR dropped 57 percent (from 58 to 25).

### OPERATIONAL ERRORS/DEVIATIONS

The number of operational errors increased a modest 4 percent from 738 in 1992 to 767 in 1993. En route operational errors, the larger component of total operational errors, increased about 12 percent from 386 in 1992 to 433 in 1993; while terminal operational errors decreased about 5 percent from 351 to 334.

Despite the small increases in total operational errors since 1991, there has been an overall downward trend from 1988 to 1993. Specifically, there has been a gross decline in operational errors of about 26 percent from 1,036 in 1988 to 767 in 1993. Terminal operational errors declined approximately 12 percent and en route operational errors declined about 34 percent over this six year period. In five of the six years, the Great Lakes region led all regions in operational errors.

Operational deviations decreased about 22 percent from 210 in 1992 to 164 in 1993. Terminal operational deviations dropped about one-third from 110 to 73, while en route operational deviations fell just 10 percent from 99 to 89. After an initial rise from 222 in 1988, operational deviations peaked in 1989 at 354, then declined 54 percent to 164 in 1993. During this time, terminal deviations declined 32 percent from 107 to 73 and en route deviations dropped 22 percent from 114 to 89.

### **PILOT DEVIATIONS**

There were 1,570 pilot deviations in 1993, down 10 percent from 1,736 in 1992. From 1992 to 1993, air deviations decreased 8 percent from 934 to 863, surface deviations dropped 6 percent from 382 to 360, and airspace violations declined 26 percent from 897 to 661. All the categories of airspace violations, except Special Use Airspace, decreased from the previous year. Class E violations had the largest improvement with a 53 percentage drop. The most frequently cited causal factor for pilot deviations, "not following ATC instructions", declined 26 percent from 491 in 1992 to 361 in 1993.

Pilot deviations declined steadily, about 47 percent, from 2,955 in 1988 to 1,570 in 1993. Over this period, airspace violations averaged 41 percent of pilot deviations, air deviations 33 percent, and other deviations about 6 percent.

### **VEHICLE/PEDESTRIAN DEVIATIONS**

Total vehicle/pedestrian deviations decreased about 6 percent from 365 in 1992 to 343 in 1993. VPD events in which there was no collision hazard or loss of separation, continued to represent over 90 percent of total VPDs and reflected a 4 percent decline from 1992 (from 328 to 315). Over the six year period beginning in 1988, total VPDs peaked in 1989 at 621 and fell continuously (about 45 percent) to 343 in 1993.

### **RUNWAY INCURSIONS**

The 189 runway incursions in 1993 represented a 14 percent decline from 219 in 1992. From 1992 to 1993, VPD runway incursions dropped 24 percent from 37 to 28, runway incursions due to surface operational errors decreased 18 percent from 90 to 74, and pilot deviation runway incursions dropped about 5 percent from 92 to 87.

From 1988 to 1990, total runway incursions increased annually from 186 to a maximum of 281 in 1990. Total runway incursions then fell 33 percent to 189 in 1993.



## **ACCIDENT DATA**

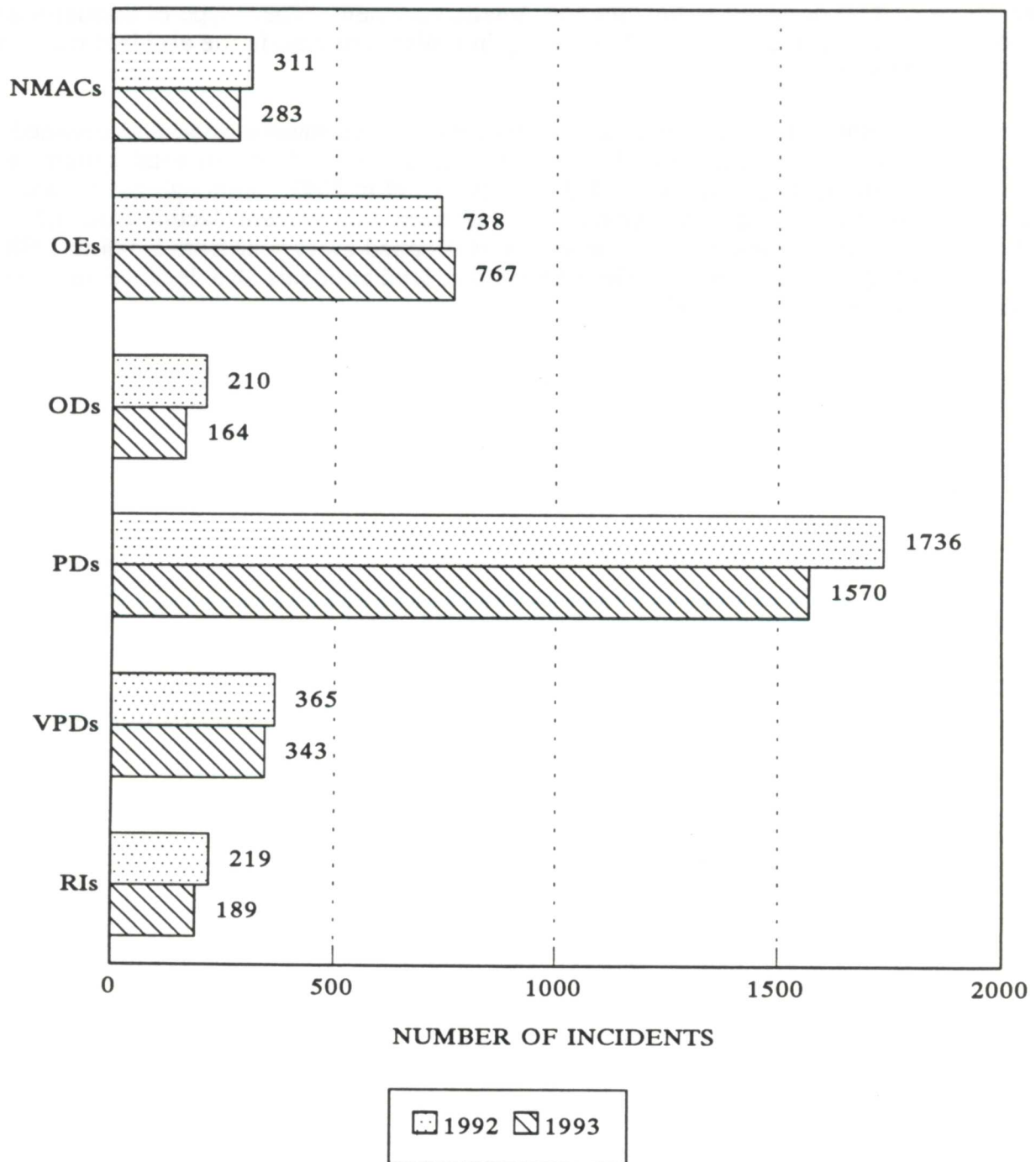
In 1993, there were 2,132 aviation accidents in the total airspace system, reflecting a 3 percent decline from 2,191 in 1992. Total system fatal accidents, which accounted for about 19 percent of all accidents, dropped 15 percent from 482 to 409, and the number of fatalities declined 21 percent from 986 to 782 in 1993. Based on the number of hours flown in 1993, total system accident rates per 100,000 hours declined from 5.41 to 5.33, while fatal accidents declined about 15 percent from 1.19 in 1992 to 1.02. About 95 percent of the accidents (2,022) occurred in the General Aviation segment. These type of accidents also dropped about 3 percent from 2,074 resulting in a slight increase in the accident rate from 8.71 in 1992 to 8.79.

Since 1988, total system accidents have demonstrated a downward trend and declined 16 percent from 2,535 to 2,132 in 1993. There was a similar trend in total system fatal accidents declining 17 percent from 493 in 1988 to 409 in 1993. Although the number of fatalities has fluctuated over the years, there has been a 33 percent decline from 1,165 in 1988 to 782 in 1993. General aviation accidents dropped every year from 2,386 in 1988 to 2,022 in 1993 (about 15 percent). General aviation fatal accidents also declined 16 percent from 460 in 1988 to 385 in 1993.



# NATIONAL AIRSPACE INCIDENTS

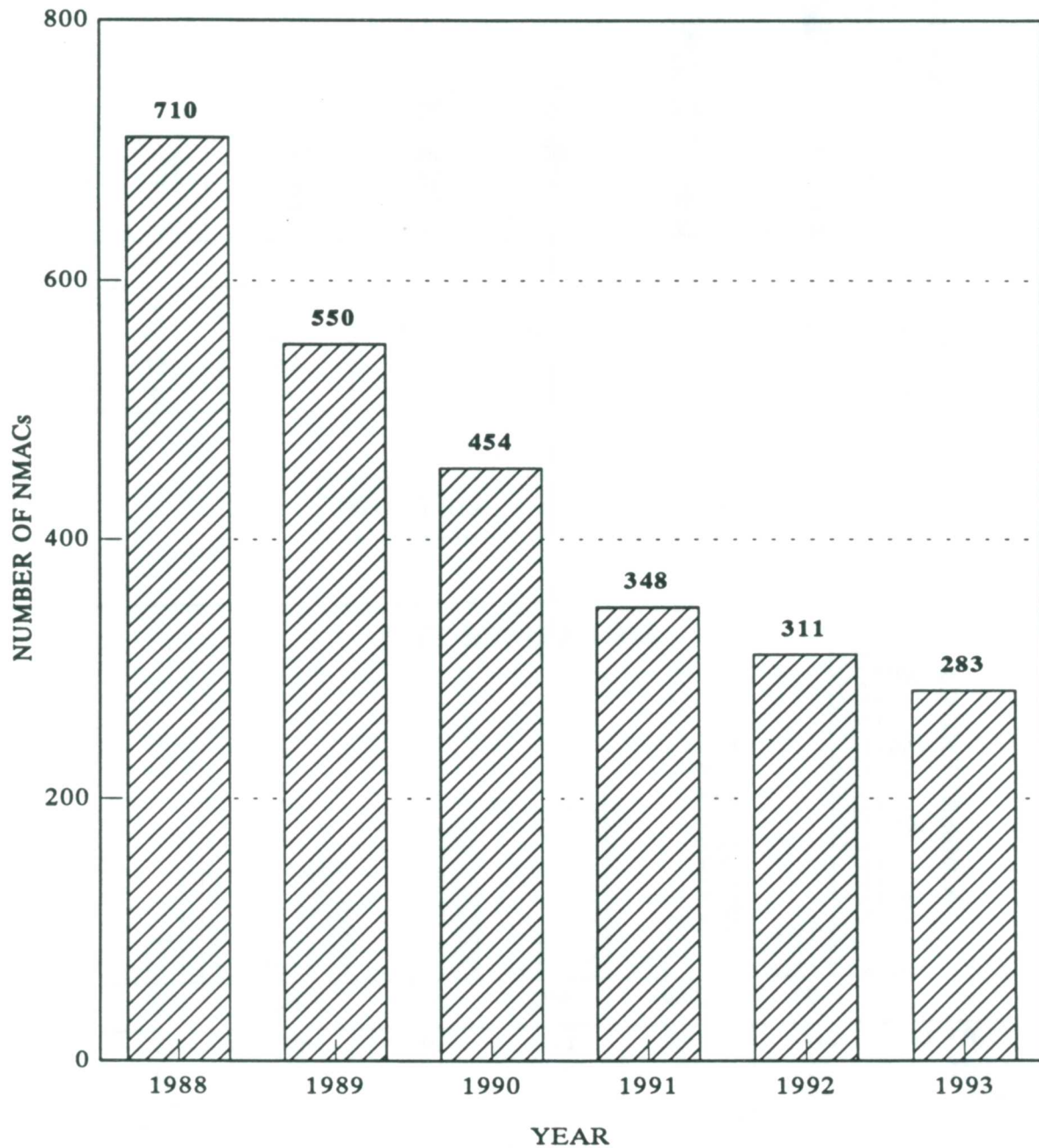
## 1992 versus 1993



## **NEAR MIDAIR COLLISIONS \***

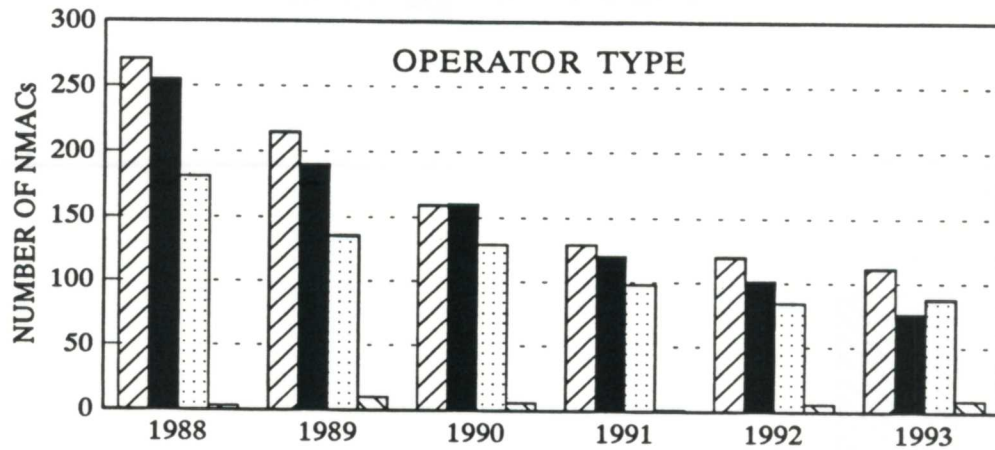
\* The reporting of a **Near Midair Collision** is voluntary and depends in part on an individual's perception of a situation. Incidents do not necessarily involve the violation of regulations or errors by air traffic controllers, nor do they necessarily represent an unsafe condition. Significant factors involved in the submission of a report may include items such as the proximity of the aircraft involved, the element of surprise in the encounter, or the expectations of the flight crew to the possibility of the occurrence of a Near Midair Collision because of an increase in publicity concerning Near Midair Collisions or midair collisions. Conversely, some Near Midair Collisions, including those which may involve unsafe conditions, may not be reported for reasons such as failure to see another aircraft or to perceive accurately the distance from another aircraft due to restricted visibility or the relative angle of approach, fear of penalty, or lack of awareness of the reporting system.

**PILOT REPORTED NEAR MIDAIR COLLISIONS  
BY YEAR  
1988 through 1993**



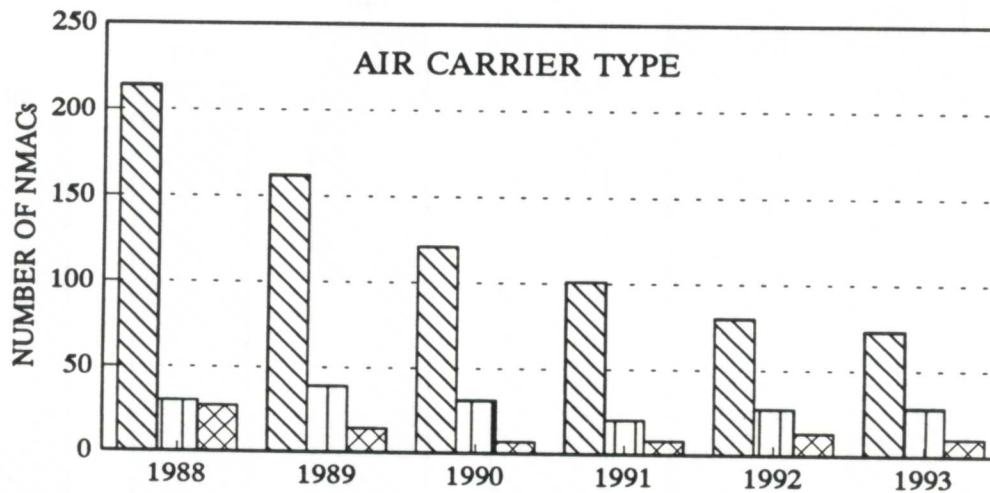
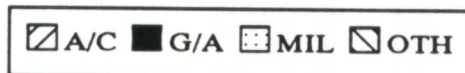


# PILOT REPORTED NEAR MIDAIR COLLISIONS BY REPORTING OPERATOR TYPE 1988 through 1993



| A/C | 271 | 215 | 159 | 129 | 120 | 111 |
|-----|-----|-----|-----|-----|-----|-----|
| G/A | 255 | 190 | 160 | 120 | 101 | 76  |
| MIL | 181 | 135 | 129 | 98  | 84  | 87  |
| OTH | 3   | 10  | 6   | 1   | 6   | 9   |

YEAR

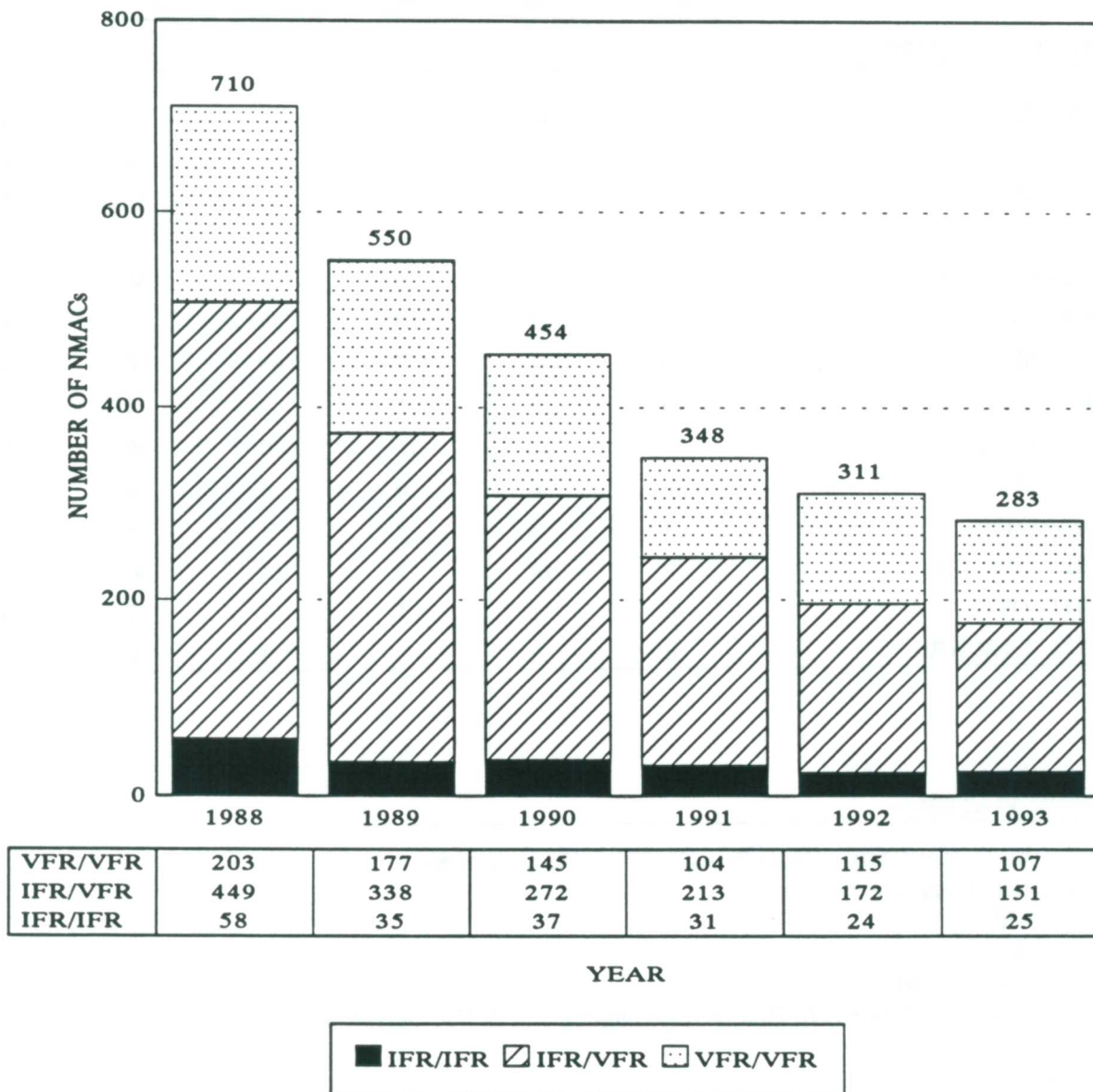


| PART 121 | 214 | 162 | 121 | 101 | 80 | 73 |
|----------|-----|-----|-----|-----|----|----|
| COM      | 30  | 39  | 31  | 20  | 27 | 28 |
| ATX      | 27  | 14  | 7   | 8   | 13 | 10 |

YEAR



# PILOT REPORTED NEAR MIDAIR COLLISIONS BY TYPE OF FLIGHT PLAN 1988 through 1993



**COMPARISON OF PILOT REPORTED NEAR MIDAIR COLLISIONS  
BY OPERATOR TYPE  
1988 through 1993**

| OPERATOR TYPE | YEARLY TOTALS |      |      |      |      |      |
|---------------|---------------|------|------|------|------|------|
|               | 1988          | 1989 | 1990 | 1991 | 1992 | 1993 |
|               | 710           | 550  | 454  | 348  | 311  | 283  |
| A/C - A/C     | 23            | 25   | 31   | 20   | 26   | 17   |
| A/C - G/A     | 231           | 164  | 106  | 93   | 52   | 43   |
| A/C - MIL     | 47            | 13   | 23   | 23   | 12   | 18   |
| A/C - OTH     | 10            | 15   | 6    | 1    | 7    | 11   |
| A/C - UNK/NR  | 18            | 22   | 15   | 15   | 30   | 30   |
| G/A - G/A     | 161           | 124  | 108  | 78   | 58   | 38   |
| G/A - MIL     | 166           | 136  | 127  | 83   | 50   | 46   |
| G/A - OTH     | 10            | 8    | 5    | 3    | 4    | 6    |
| G/A - UNK/NR  | 11            | 15   | 15   | 10   | 30   | 19   |
| MIL - MIL     | 20            | 8    | 6    | 4    | 6    | 3    |
| MIL - OTH     | 4             | 5    | 2    | 3    | 6    | 13   |
| MIL - UNK/NR  | 9             | 14   | 9    | 15   | 30   | 38   |
| OTH - OTH     | 0             | 1    | 1    | 0    | 0    | 0    |
| OTH - UNK/NR  | 0             | 0    | 0    | 0    | 0    | 1    |

**ABBREVIATIONS:**

A/C = Air Carrier (Data includes Part 121, 129 & 135 Operators)

G/A = General Aviation

MIL = Military

UNK = Unknown

NR = Not Reported

OTH = Other (1992 and 1993 Data includes Other & Public Use Operators)



**PILOT REPORTED NEAR MIDAIR COLLISIONS  
BY DEGREE OF HAZARD  
1988 through 1993**

| YEAR | DEGREE OF HAZARD |           |           |        |       |
|------|------------------|-----------|-----------|--------|-------|
|      | CRITICAL         | POTENTIAL | NO HAZARD | OPEN * | TOTAL |
| 1988 | 110              | 442       | 158       | 0      | 710   |
| 1989 | 93               | 322       | 135       | 0      | 550   |
| 1990 | 74               | 266       | 114       | 0      | 454   |
| 1991 | 52               | 197       | 99        | 0      | 348   |
| 1992 | 46               | 195       | 70        | 0      | 311   |
| 1993 | 31               | 133       | 46        | 73     | 283   |

\* Investigation Underway

**PILOT REPORTED NEAR MIDAIR COLLISIONS  
BY REGION  
1988 through 1993**

| YEAR | REGION |     |     |     |     |     |     |     |     | TOTAL |
|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|      | AAL    | ACE | AEA | AGL | ANE | ANM | ASO | ASW | AWP |       |
| 1988 | 16     | 14  | 106 | 60  | 34  | 59  | 117 | 85  | 219 | 710   |
| 1989 | 4      | 15  | 61  | 46  | 30  | 46  | 93  | 84  | 171 | 550   |
| 1990 | 12     | 12  | 45  | 36  | 11  | 37  | 75  | 74  | 152 | 454   |
| 1991 | 6      | 3   | 54  | 33  | 9   | 24  | 72  | 52  | 95  | 348   |
| 1992 | 11     | 6   | 36  | 22  | 15  | 37  | 54  | 39  | 91  | 311   |
| 1993 | 9      | 4   | 33  | 21  | 16  | 31  | 53  | 34  | 82  | 283   |

**PILOT REPORTED NEAR MIDAIR COLLISIONS BY STATE**  
**1988 through 1993**

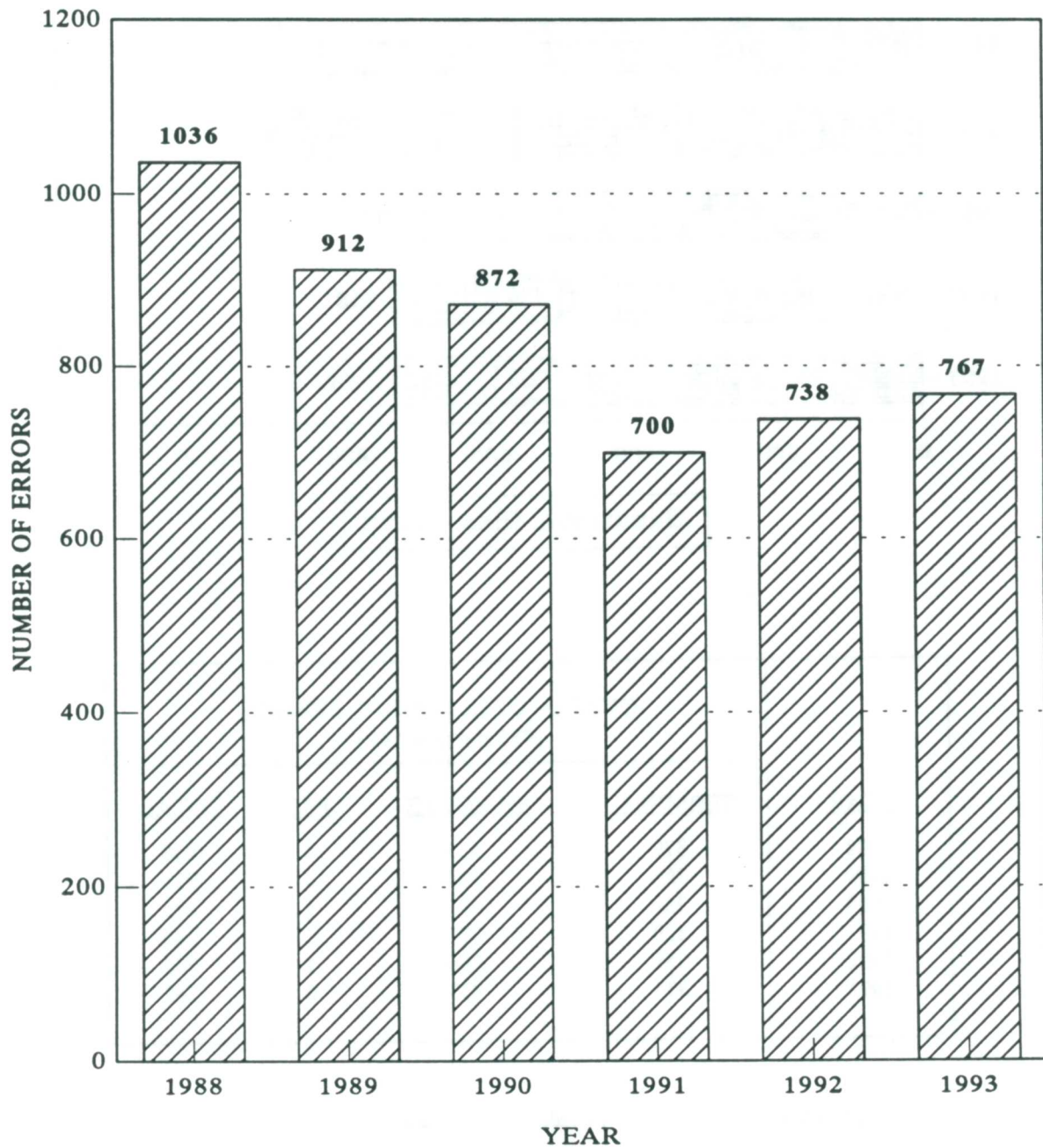
| STATE                | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | STATE                   | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|----------------------|------|------|------|------|------|------|-------------------------|------|------|------|------|------|------|
| Alabama              | 5    | 3    | 1    | 5    | 1    | 7    | Montana                 | 2    | 2    | 2    | 2    | 3    | 3    |
| Alaska               | 16   | 4    | 12   | 6    | 11   | 9    | Nebraska                | 2    | 4    | 1    | 1    | 0    | 0    |
| Arizona              | 30   | 35   | 24   | 20   | 22   | 10   | Nevada                  | 11   | 2    | 2    | 5    | 2    | 3    |
| Arkansas             | 1    | 3    | 5    | 1    | 2    | 0    | New Hampshire           | 8    | 6    | 0    | 0    | 0    | 2    |
| Bahamas              | 3    | 0    | 2    | 0    | 1    | 0    | New Jersey              | 23   | 11   | 14   | 13   | 5    | 5    |
| California           | 170  | 123  | 123  | 67   | 66   | 66   | New Mexico              | 9    | 3    | 4    | 3    | 0    | 4    |
| Colorado             | 10   | 10   | 4    | 9    | 14   | 3    | New York                | 35   | 13   | 12   | 15   | 13   | 10   |
| Connecticut          | 11   | 7    | 6    | 3    | 7    | 6    | North Carolina          | 11   | 12   | 3    | 4    | 3    | 6    |
| Delaware             | 8    | 4    | 1    | 0    | 0    | 2    | North Dakota            | 1    | 1    | 2    | 1    | 0    | 0    |
| District of Columbia | 4    | 1    | 2    | 4    | 0    | 2    | Ohio                    | 9    | 5    | 10   | 5    | 4    | 4    |
| Florida              | 57   | 48   | 49   | 31   | 30   | 22   | Oklahoma                | 5    | 11   | 11   | 5    | 5    | 5    |
| Georgia              | 16   | 7    | 5    | 13   | 6    | 4    | Oregon                  | 9    | 4    | 10   | 2    | 5    | 9    |
| Guam                 | 0    | 0    | 0    | 1    | 0    | 0    | Pennsylvania            | 12   | 12   | 9    | 7    | 4    | 1    |
| Hawaii               | 8    | 11   | 3    | 2    | 1    | 3    | Puerto Rico             | 7    | 3    | 2    | 4    | 3    | 3    |
| Idaho                | 1    | 0    | 0    | 1    | 0    | 3    | Rhode Island            | 2    | 5    | 1    | 1    | 1    | 0    |
| Illinois             | 23   | 16   | 9    | 12   | 6    | 7    | South Carolina          | 6    | 4    | 1    | 5    | 1    | 1    |
| Indiana              | 8    | 6    | 6    | 6    | 2    | 2    | South Dakota            | 3    | 1    | 0    | 2    | 0    | 1    |
| Iowa                 | 1    | 1    | 0    | 0    | 0    | 1    | Tennessee               | 5    | 3    | 7    | 2    | 3    | 5    |
| Kansas               | 8    | 7    | 6    | 1    | 3    | 1    | Texas                   | 63   | 57   | 48   | 43   | 28   | 19   |
| Kentucky             | 4    | 6    | 3    | 2    | 3    | 0    | Utah                    | 6    | 13   | 4    | 2    | 5    | 3    |
| Louisiana            | 7    | 10   | 6    | 0    | 4    | 6    | Vermont                 | 1    | 0    | 0    | 0    | 0    | 0    |
| Maine                | 1    | 2    | 0    | 3    | 1    | 0    | Virgin Islands          | 0    | 2    | 0    | 0    | 1    | 2    |
| Maryland             | 10   | 9    | 3    | 5    | 7    | 4    | Virginia                | 13   | 9    | 2    | 9    | 8    | 9    |
| Massachusetts        | 11   | 10   | 4    | 2    | 5    | 7    | Wake Island             | 0    | 0    | 0    | 0    | 0    | 0    |
| Michigan             | 6    | 9    | 7    | 5    | 4    | 3    | Washington              | 29   | 17   | 15   | 6    | 9    | 9    |
| Minnesota            | 3    | 3    | 1    | 2    | 4    | 2    | West Virginia           | 1    | 2    | 2    | 1    | 0    | 1    |
| Mississippi          | 3    | 5    | 2    | 6    | 2    | 2    | Wisconsin               | 7    | 5    | 1    | 0    | 2    | 2    |
| Missouri             | 3    | 3    | 5    | 1    | 3    | 3    | Wyoming                 | 2    | 0    | 2    | 2    | 1    | 1    |
| TOTAL                |      |      |      |      |      |      | TOTAL                   |      |      |      |      |      |      |
|                      |      |      |      |      |      |      | 710 550 454 348 311 283 |      |      |      |      |      |      |



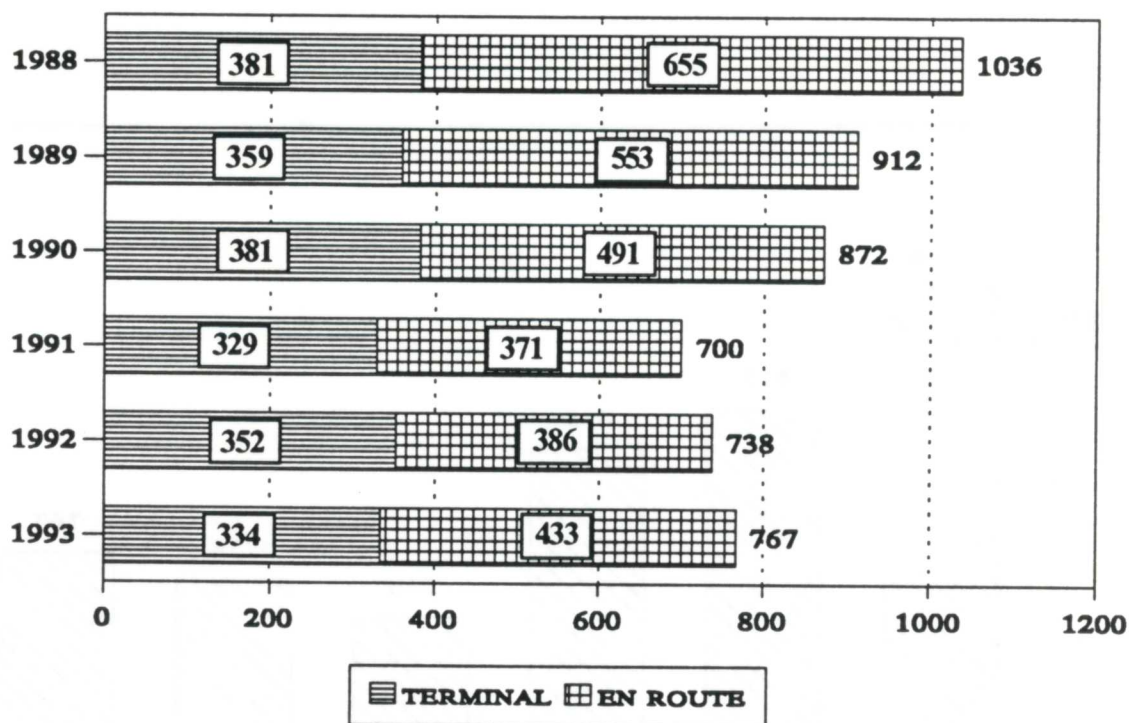
## **OPERATIONAL ERRORS/DEVIATIONS \***

\* The use of absolute numbers of **Operational Errors/Deviations** as an indication of the performance of the air traffic control system can be misleading because of the apparent relationship between **Operational Errors/Deviations** and traffic activity; an increase or decrease in the error/deviation count may merely reflect a corresponding rise or fall in the number of aircraft using the national airspace over a given period.

**OPERATIONAL ERRORS  
BY YEAR  
1988 through 1993**



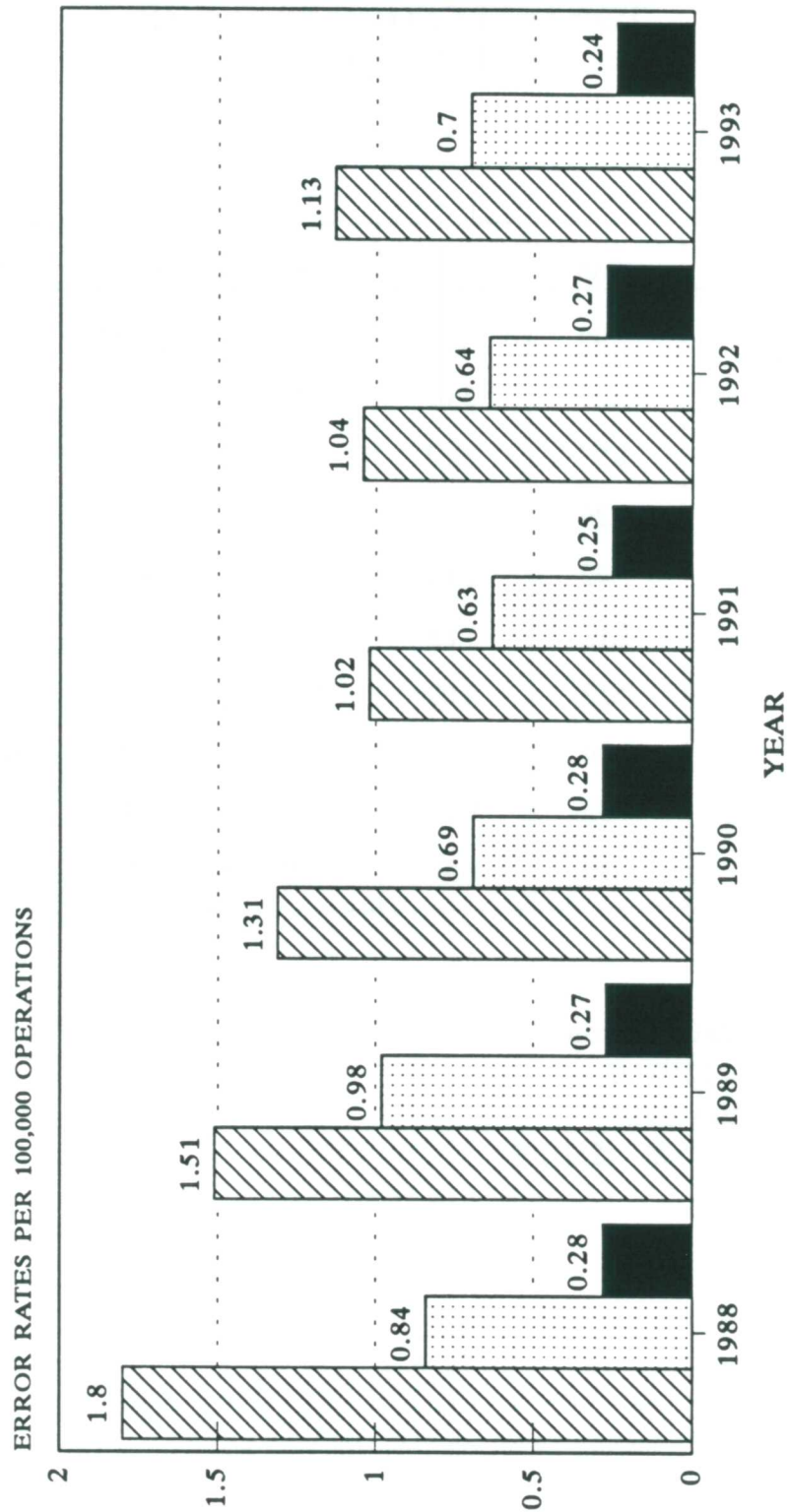
## OPERATIONAL ERRORS 1988 through 1993



| YEAR | TYPE OF OPERATIONAL ERRORS<br>1988 through 1993 |          |     |       |
|------|-------------------------------------------------|----------|-----|-------|
|      | TERMINAL                                        | EN ROUTE | FSS | TOTAL |
| 1988 | 379                                             | 655      | 2   | 1036  |
| 1989 | 356                                             | 553      | 3   | 912   |
| 1990 | 380                                             | 491      | 1   | 872   |
| 1991 | 328                                             | 371      | 1   | 700   |
| 1992 | 351                                             | 386      | 1   | 738   |
| 1993 | 334                                             | 433      | 0   | 767   |

Note: In graphic overview FSSs are included in Terminals.

# **OPERATIONAL ERROR RATES BY FACILITY TYPE 1988 through 1993**



Actual Error Data thru 12/31/93  
Actual Activity Data thru 8/31/93  
Forecast Activity Data 9/1/93 - 12/31/93



**OPERATIONAL ERROR RATES  
TOP ARTCCs (1993 RANKING)  
1988 through 1993**

| <b>FACILITY</b>  | <b>1988</b> | <b>1989</b> | <b>1990</b> | <b>1991</b> | <b>1992</b> | <b>1993</b> |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Washington, DC   | 2.93        | 2.21        | 1.99        | 2.17        | 2.07        | 2.53        |
| New York, NY     | 3.37        | 3.00        | 1.85        | 1.79        | 1.87        | 2.24        |
| Atlanta, GA      | 1.97        | 1.63        | 1.48        | 0.74        | 0.81        | 1.54        |
| Boston, MA       | 2.29        | 2.44        | 1.53        | 0.98        | 0.93        | 1.32        |
| Indianapolis, IN | 2.72        | 2.04        | 1.99        | 1.38        | 1.41        | 1.31        |
| Jacksonville, FL | 2.11        | 1.83        | 1.59        | 1.05        | 1.20        | 1.27        |
| Cleveland, OH    | 2.18        | 2.03        | 1.38        | 1.21        | 1.16        | 1.22        |
| Fort Worth, TX   | 1.34        | 0.57        | 1.48        | 0.62        | 0.85        | 1.16        |
| Los Angeles, CA  | 1.89        | 1.36        | 1.53        | 0.94        | 1.01        | 1.16        |
| Anchorage, AK    | 0.70        | 1.54        | 0.21        | 0.60        | 0.98        | 1.16        |

Error Rates Per 100,000 Operations

Actual Error Data thru 12/31/93

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

**OPERATIONAL ERROR RATES  
TOP TRACONS (1993 RANKING)  
1988 through 1993**

| <b>FACILITY</b>      | <b>1988</b> | <b>1989</b> | <b>1990</b> | <b>1991</b> | <b>1992</b> | <b>1993</b> |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| New York, NY         | 1.15        | 1.21        | 0.73        | 0.48        | 1.04        | 1.59        |
| Chicago, IL          | 2.23        | 1.18        | 0.83        | 0.85        | 1.17        | 1.57        |
| Phoenix, AZ          | 0.15        | 0.44        | 0.15        | 0.48        | 0.35        | 1.35        |
| Denver, CO           | 0.69        | 0.54        | 1.21        | 0.52        | 0.33        | 1.31        |
| El Toro (MCAS), CA   | 1.32        | 0.53        | 0.30        | 0.31        | 0.59        | 1.23        |
| Los Angeles, CA      | 1.00        | 1.11        | 0.26        | 1.06        | 0.66        | 1.17        |
| Dallas/Ft. Worth, TX | 0.57        | 0.47        | 1.02        | 0.74        | 0.36        | 0.76        |
| Detroit, MI          | 1.19        | 1.02        | 0.38        | 0.52        | 0.99        | 0.76        |
| St. Louis, MO        | 0.19        | 0.56        | 0.19        | 0.20        | 0.00        | 0.73        |
| Ontario, CA          | 0.56        | 1.47        | 0.74        | 1.52        | 0.93        | 0.61        |

Error Rates Per 100,000 Operations  
 Actual Error Data thru 12/31/93  
 Actual Activity Data thru 8/31/93  
 Forecast Activity Data 9/1/93 - 12/31/93

**OPERATIONAL ERROR RATES  
TOP TERMINALS (1993 RANKING)  
BY FACILITY LEVEL**

| FACILITY LEVEL = I              |          |       |      |          |       |      |
|---------------------------------|----------|-------|------|----------|-------|------|
| FACILITY                        | 1992     |       |      | 1993     |       |      |
|                                 | ACTIVITY | ERROR | RATE | ACTIVITY | ERROR | RATE |
| Columbia Regional Arpt, MO      | 63,723   | 1     | 1.57 | 74,256   | 2     | 2.69 |
| La Crosse Muni Arpt, WI         | 83,102   | 0     | 0.00 | 72,168   | 1     | 1.39 |
| Felts Field Arpt, WA            | 79,568   | 0     | 0.00 | 83,160   | 1     | 1.20 |
| Panama City-Bay County Arpt, FL | 121,765  | 0     | 0.00 | 113,253  | 1     | 0.88 |
| Niagara Falls Intl, NY          | 108,844  | 0     | 0.00 | 119,188  | 1     | 0.84 |

| FACILITY LEVEL = II                    |          |       |      |          |       |      |
|----------------------------------------|----------|-------|------|----------|-------|------|
| FACILITY                               | 1992     |       |      | 1993     |       |      |
|                                        | ACTIVITY | ERROR | RATE | ACTIVITY | ERROR | RATE |
| Roswell Industrial Air Center Arpt, NM | 121,049  | 1     | 0.83 | 114,297  | 2     | 1.75 |
| Sonoma County Arpt, CA                 | 162,976  | 0     | 0.00 | 161,308  | 2     | 1.24 |
| St. Petersburg/Clearwater Intl, FL     | 189,007  | 0     | 0.00 | 197,017  | 2     | 1.02 |
| Yakima Air Terminal Arpt, WA           | 106,512  | 0     | 0.00 | 106,023  | 1     | 0.94 |
| Mansfield Lahm Muni Arpt, OH           | 94,227   | 0     | 0.00 | 106,887  | 1     | 0.94 |
| Mathis Field Arpt, TX                  | 108,170  | 0     | 0.00 | 110,916  | 1     | 0.90 |
| Palo Alto Arpt, CA                     | 229,128  | 0     | 0.00 | 222,976  | 2     | 0.90 |
| Waterloo Muni Arpt, IA                 | 111,955  | 0     | 0.00 | 113,397  | 1     | 0.88 |
| Great Falls Intl, MT                   | 123,333  | 0     | 0.00 | 126,548  | 1     | 0.79 |
| Pueblo Memorial Arpt, CO               | 133,697  | 0     | 0.00 | 129,922  | 1     | 0.77 |

| FACILITY LEVEL = III             |          |       |      |          |       |      |
|----------------------------------|----------|-------|------|----------|-------|------|
| FACILITY                         | 1992     |       |      | 1993     |       |      |
|                                  | ACTIVITY | ERROR | RATE | ACTIVITY | ERROR | RATE |
| Andrews Air Force Base, MD       | 141,336  | 1     | 0.71 | 136,131  | 2     | 1.47 |
| Evansville Regional Arpt, IN     | 200,706  | 1     | 0.50 | 211,767  | 2     | 0.94 |
| Wichita Mid-Continent, KS        | 436,543  | 5     | 1.15 | 429,019  | 4     | 0.93 |
| Palm Springs Regional Arpt, CA   | 232,747  | 0     | 0.00 | 239,183  | 2     | 0.84 |
| Robert Mueller Muni Arpt, TX     | 427,515  | 1     | 0.23 | 480,238  | 4     | 0.83 |
| Greater Peoria Regional Arpt, IL | 236,947  | 0     | 0.00 | 242,702  | 2     | 0.82 |
| Fort Wayne Intl, IN              | 240,355  | 0     | 0.00 | 245,595  | 2     | 0.81 |
| William P. Hobby Arpt, TX        | 240,907  | 0     | 0.00 | 256,203  | 2     | 0.78 |
| Standiford Field Arpt, KY        | 393,050  | 1     | 0.25 | 416,264  | 3     | 0.72 |
| Sarasota-Bradenton Arpt, FL      | 156,549  | 1     | 0.64 | 166,138  | 1     | 0.60 |

Rates Per 100,000 Operations

Actual Error Data thru 12/31/93  
Actual Activity Data thru 8/31/93  
Forecast Activity Data 9/1/93 - 12/31/93

**OPERATIONAL ERROR RATES (CON'T)**  
**TOP TERMINALS (1993 RANKING)**  
**BY FACILITY LEVEL**

| FACILITY LEVEL = IV                   |          |       |      |          |       |      |
|---------------------------------------|----------|-------|------|----------|-------|------|
| FACILITY                              | 1992     |       |      | 1993     |       |      |
|                                       | ACTIVITY | ERROR | RATE | ACTIVITY | ERROR | RATE |
| Theodore Francis Green State Arpt, RI | 137,780  | 0     | 0.00 | 342,082  | 7     | 2.05 |
| Detroit Metro Wayne County Arpt, MI   | 427,383  | 1     | 0.23 | 458,862  | 4     | 0.87 |
| Corpus Christi Intl, TX               | 454,606  | 4     | 0.88 | 393,577  | 3     | 0.76 |
| Nashville Intl, TN                    | 676,751  | 0     | 0.00 | 697,551  | 5     | 0.72 |
| Cleveland-Hopkins Intl, OH            | 583,575  | 6     | 1.03 | 572,636  | 4     | 0.70 |
| Cincinnati/Northern Kentucky Intl, OH | 721,989  | 5     | 0.69 | 774,458  | 5     | 0.65 |
| Jacksonville Intl, FL                 | 489,503  | 2     | 0.41 | 479,868  | 3     | 0.63 |
| Kansas City Intl, MO                  | 474,949  | 4     | 0.84 | 527,466  | 3     | 0.57 |
| Albuquerque Intl, NM                  | 492,971  | 0     | 0.00 | 546,386  | 3     | 0.55 |
| Tucson Tracon, AZ                     | 266,967  | 2     | 0.75 | 188,137  | 1     | 0.53 |

| FACILITY LEVEL = V           |           |       |      |           |       |      |
|------------------------------|-----------|-------|------|-----------|-------|------|
| FACILITY                     | 1992      |       |      | 1993      |       |      |
|                              | ACTIVITY  | ERROR | RATE | ACTIVITY  | ERROR | RATE |
| New York Tracon, NY          | 1,822,996 | 19    | 1.04 | 1,506,074 | 24    | 1.59 |
| Chicago Tracon, IL           | 1,110,825 | 13    | 1.17 | 1,080,409 | 17    | 1.57 |
| Phoenix Tracon, AZ           | 567,550   | 2     | 0.35 | 591,193   | 8     | 1.35 |
| Denver Tracon, CO            | 598,322   | 2     | 0.33 | 685,086   | 9     | 1.31 |
| Washington National Arpt, WA | 838,143   | 22    | 2.62 | 691,388   | 9     | 1.30 |
| El Toro (MCAS), CA           | 678,419   | 4     | 0.59 | 651,940   | 8     | 1.23 |
| Los Angeles Tracon, CA       | 754,430   | 5     | 0.66 | 426,102   | 5     | 1.17 |
| San Francisco Intl, CA       | 423,437   | 2     | 0.47 | 437,831   | 4     | 0.91 |
| Dallas/Ft. Worth Tracon, TX  | 1,119,128 | 4     | 0.36 | 1,185,239 | 9     | 0.76 |
| Detroit Tracon, MI           | 607,572   | 6     | 0.99 | 658,837   | 5     | 0.76 |

Rates Per 100,000 Operations

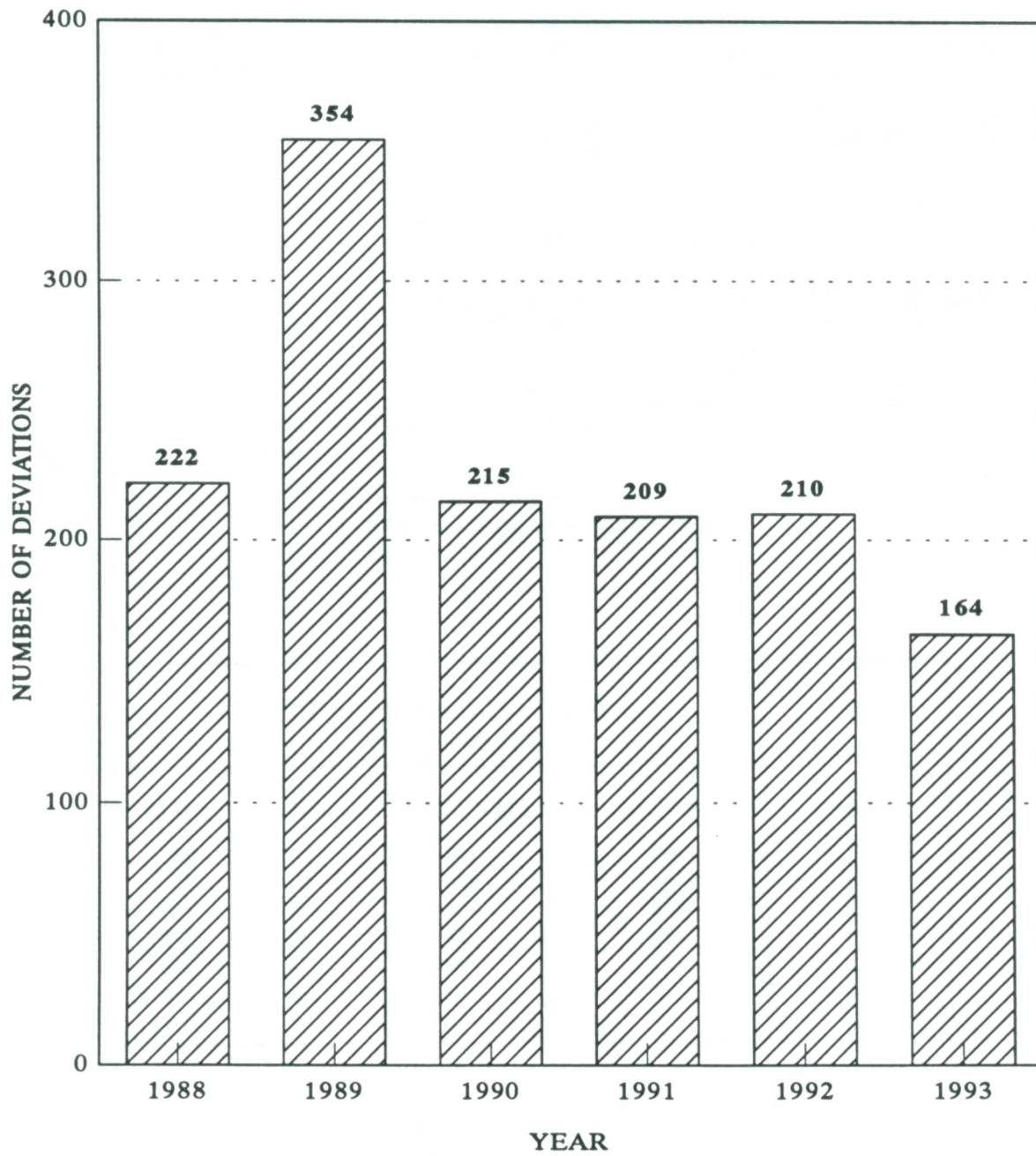
Actual Error Data thru 12/31/93  
 Actual Activity Data thru 8/31/93  
 Forecast Activity Data 9/1/93 - 12/31/93



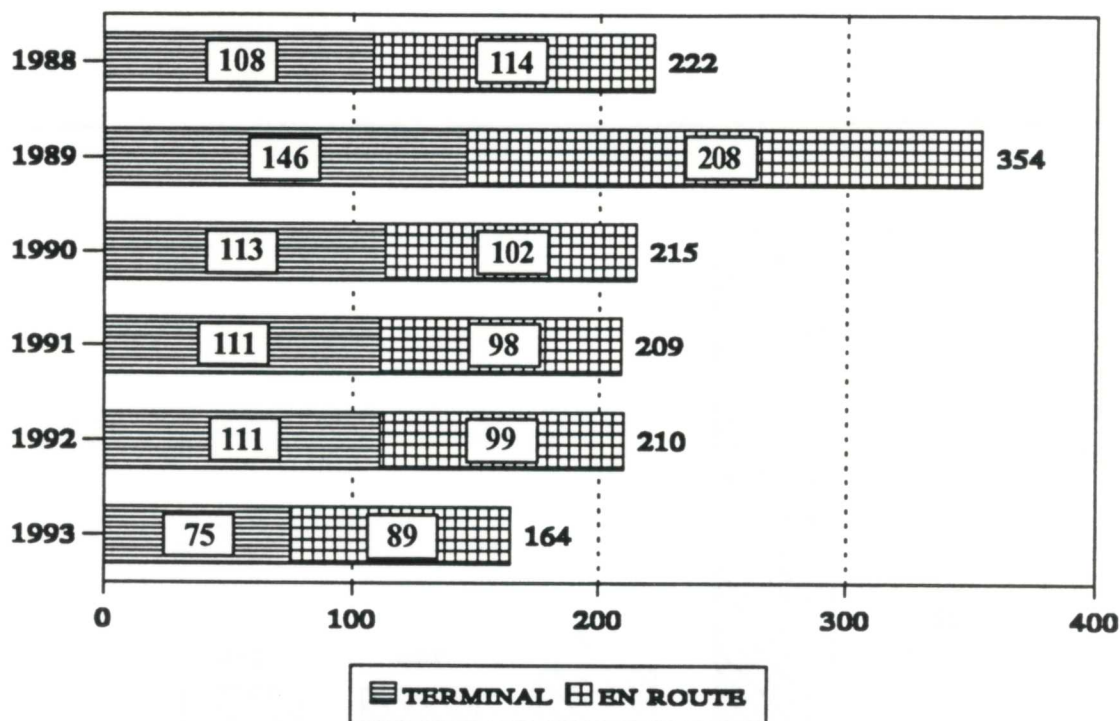
**OPERATIONAL ERRORS  
BY REGION  
1988 through 1993**

| YEAR | REGION |     |     |     |     |     |     |     |     | TOTAL |
|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|      | AAL    | ACE | AEA | AGL | ANE | ANM | ASO | ASW | AWP |       |
| 1988 | 5      | 42  | 198 | 263 | 63  | 55  | 171 | 111 | 128 | 1036  |
| 1989 | 12     | 35  | 162 | 198 | 59  | 73  | 161 | 95  | 117 | 912   |
| 1990 | 4      | 29  | 135 | 193 | 44  | 95  | 149 | 113 | 110 | 872   |
| 1991 | 6      | 30  | 141 | 158 | 29  | 61  | 104 | 76  | 95  | 700   |
| 1992 | 7      | 33  | 161 | 161 | 24  | 63  | 126 | 75  | 88  | 738   |
| 1993 | 7      | 32  | 157 | 153 | 28  | 61  | 151 | 82  | 96  | 767   |

**OPERATIONAL DEVIATIONS  
BY YEAR  
1988 through 1993**



## OPERATIONAL DEVIATIONS 1988 through 1993



| YEAR | TYPE OF OPERATIONAL DEVIATIONS<br>1988 through 1993 |          |     |       |
|------|-----------------------------------------------------|----------|-----|-------|
|      | TERMINAL                                            | EN ROUTE | FSS | TOTAL |
| 1988 | 107                                                 | 114      | 1   | 222   |
| 1989 | 145                                                 | 208      | 1   | 354   |
| 1990 | 112                                                 | 102      | 1   | 215   |
| 1991 | 110                                                 | 98       | 1   | 209   |
| 1992 | 110                                                 | 99       | 1   | 210   |
| 1993 | 73                                                  | 89       | 2   | 164   |

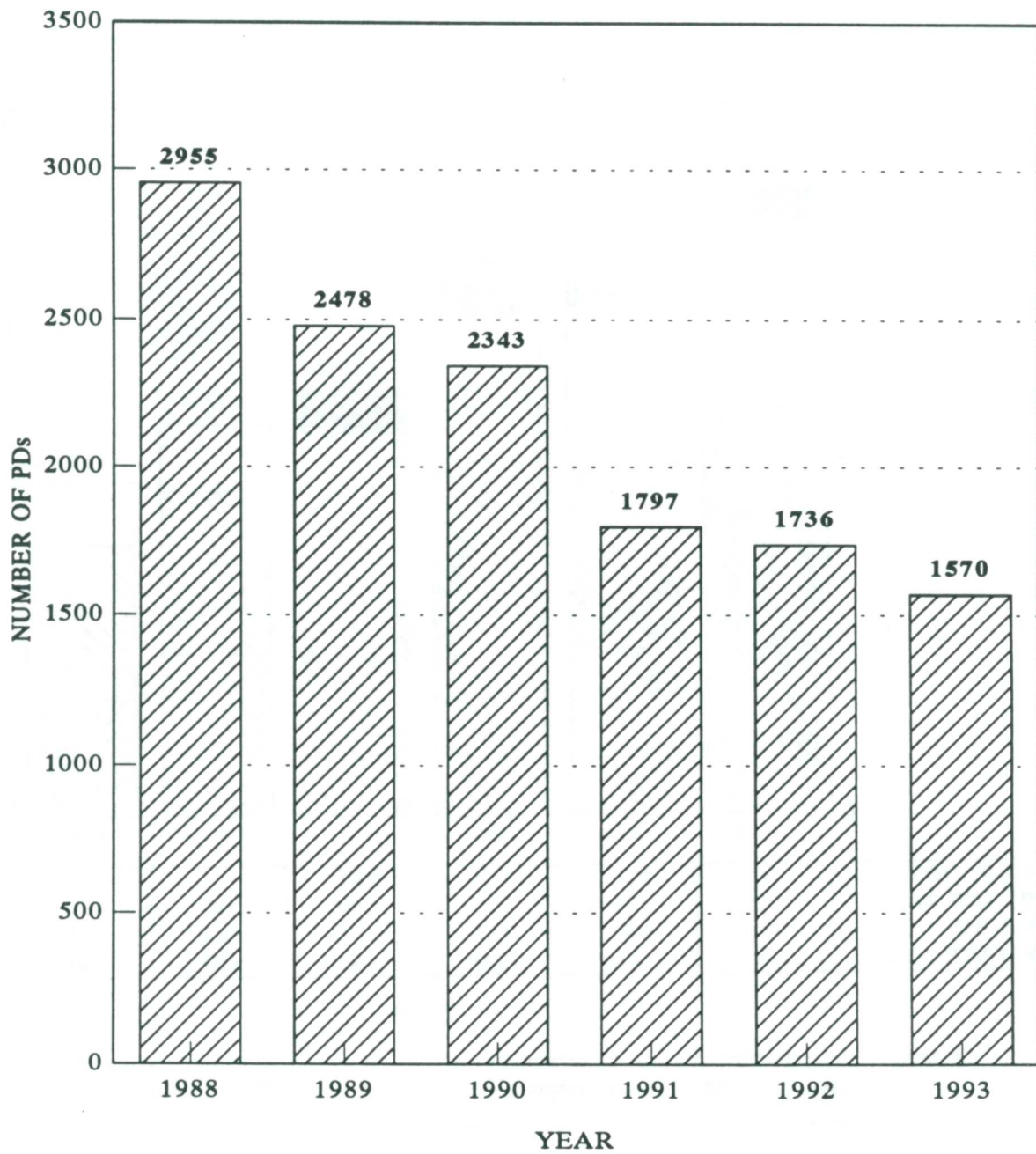
Note: In graphic overview FSSs are included in Terminals.

## **PILOT DEVIATIONS \***

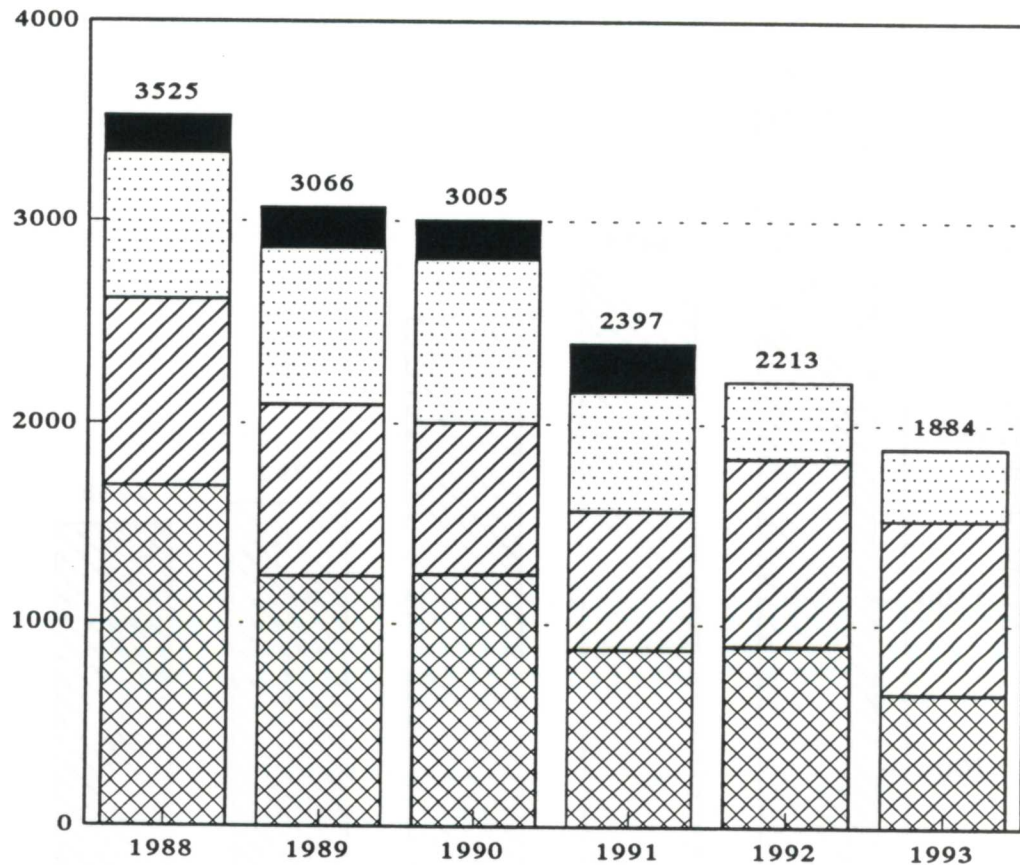
\* While the Pilot Deviation data are considered useful in identifying possible trends associated with Pilot Deviation occurrences, there are certain limitations which should be considered when using the data presented in this report. The information in the database reflects a mix of preliminary and final reports. Thus, the data presented are subject to minor changes as all reports become final. Pilot Deviation monthly totals require 90 days to stabilize completely due to reporting procedures, volume, and workload; therefore, care should be exercised in making statistical comparisons for the most recent 90-day period.



**PILOT DEVIATIONS  
BY YEAR  
1988 through 1993**



# PILOT DEVIATIONS BY DEVIATION TYPE 1988 through 1993



|                |      |      |      |     |     |     |
|----------------|------|------|------|-----|-----|-----|
| OTHER DEV.     | 186  | 201  | 194  | 241 |     |     |
| SURFACE DEV.   | 726  | 770  | 806  | 589 | 382 | 360 |
| AIR DEV.       | 926  | 857  | 757  | 687 | 934 | 863 |
| AIRSPACE VIOL. | 1687 | 1238 | 1248 | 880 | 897 | 661 |

YEAR

AIRSPACE VIOL.
 AIR DEV.
 SURFACE DEV.
 OTHER DEV.

NOTE: Total deviations reported exceed total reports since a single report may involve several violations. 1992 and 1993 categories combine ATC Clearance and Other into one category: Air Deviation.

**PILOT DEVIATIONS  
BY TYPE OF AIRSPACE VIOLATION  
1988 through 1993**

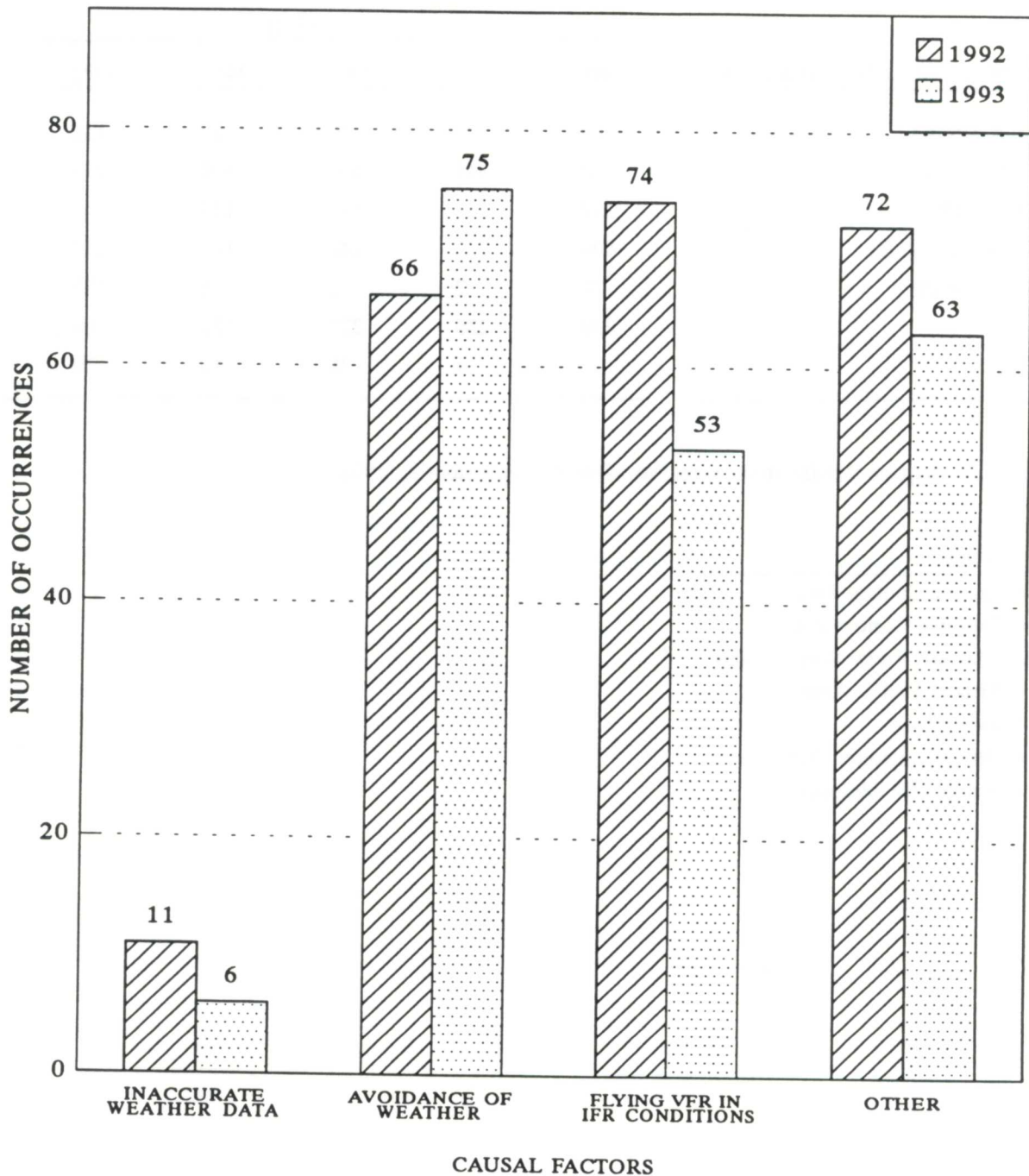
| TYPE OF AIRSPACE VIOLATIONS | YEAR |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|
|                             | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
| CLASS A (PCA)               | 24   | 28   | 17   | 27   | 111  | 75   |
| CLASS B (TCA)               | 580  | 414  | 530  | 308  | 239  | 174  |
| CLASS C (ARSA)              | 357  | 241  | 177  | 147  | 146  | 109  |
| CLASS D (ATA/CZ)            | 404  | 257  | 247  | 180  | 112  | 74   |
| CLASS E (OCA)               | 36   | 2    | 2    | 0    | 129  | 60   |
| SUA                         | 239  | 238  | 222  | 151  | 101  | 115  |
| OTHER                       | 5    | 11   | 20   | 41   | 59   | 54   |

NOTE: New airspace classifications went into effect on September 16, 1993.

**ACRONYMS:**

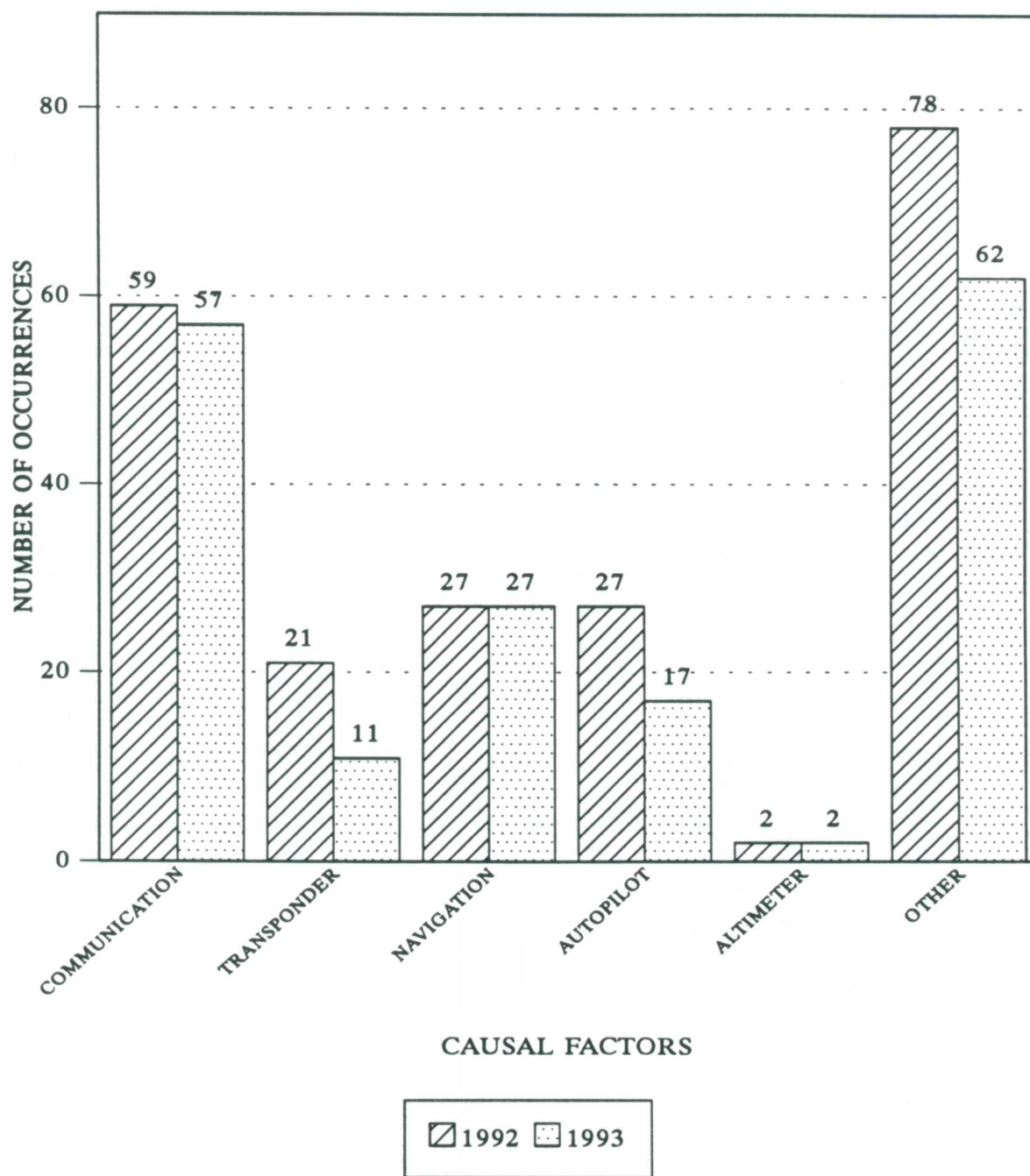
PCA = Positive Control Area  
TCA = Terminal Control Area  
ARSA = Airport Radar Service Area  
ATA = Airport Traffic Area  
CZ = Control Zone  
OCA = Other Controlled Airspace  
SUA = Special Use Airspace

# PILOT DEVIATIONS BY CAUSAL FACTORS WEATHER 1992 versus 1993

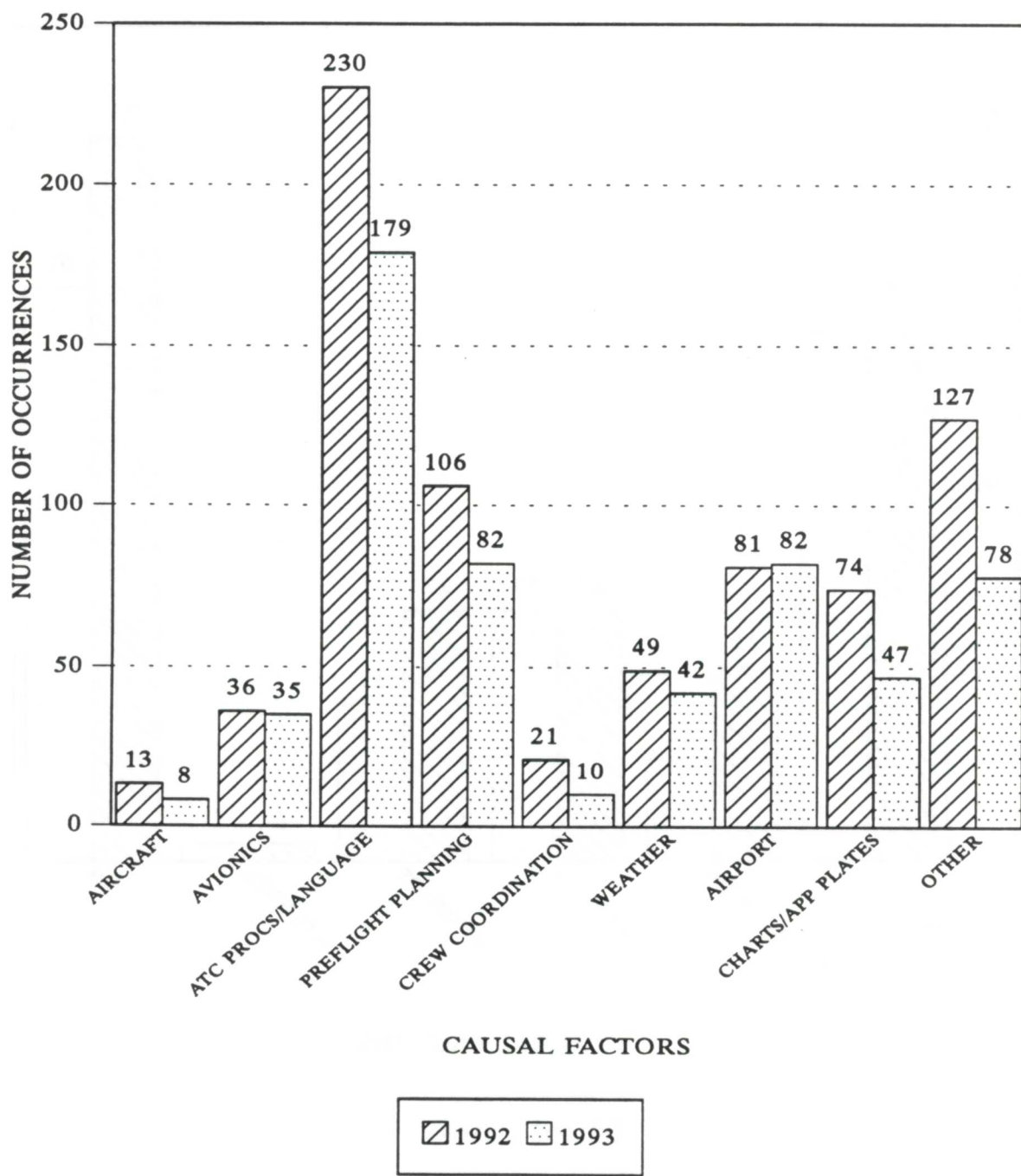




# PILOT DEVIATIONS BY CAUSAL FACTORS AIRCRAFT EQUIPMENT MALFUNCTION 1992 versus 1993



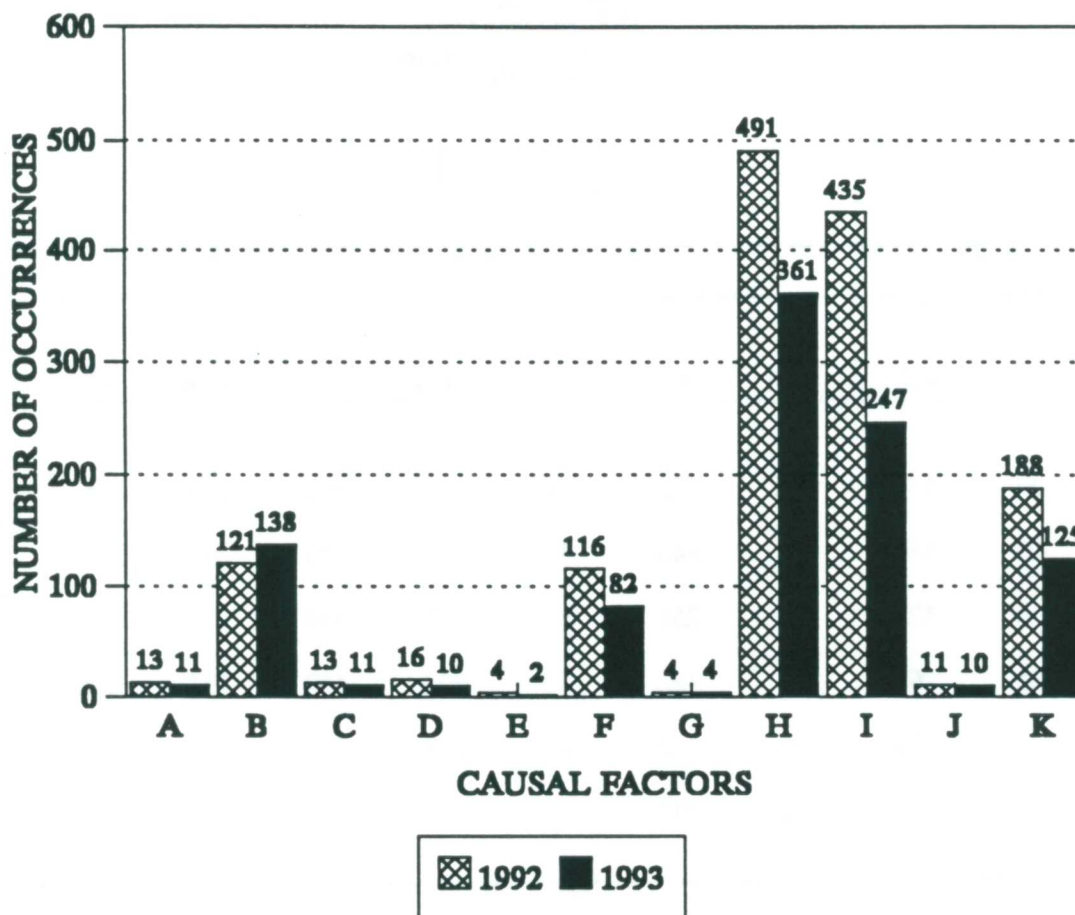
# **PILOT DEVIATIONS BY CAUSAL FACTORS** **PILOT'S KNOWLEDGE/EXPERIENCE** **1992 versus 1993**



# PILOT DEVIATIONS BY CAUSAL FACTORS

## OPERATIONAL

### 1992 versus 1993



- A. Overworked
- B. Distracted
- C. Fatigued
- D. Not Actively Scanning
- E. Unable to Locate Traffic, Even With Traffic Advisory
- F. Disoriented or Lost
- G. Sick
- H. Not Following ATC Instructions
- I. Operating in Class A, B, C, or D Without Required Communication or Authorization
- J. Operating With Transponder Off
- K. Other

**PILOT DEVIATIONS  
BY REGION  
1988 through 1993**

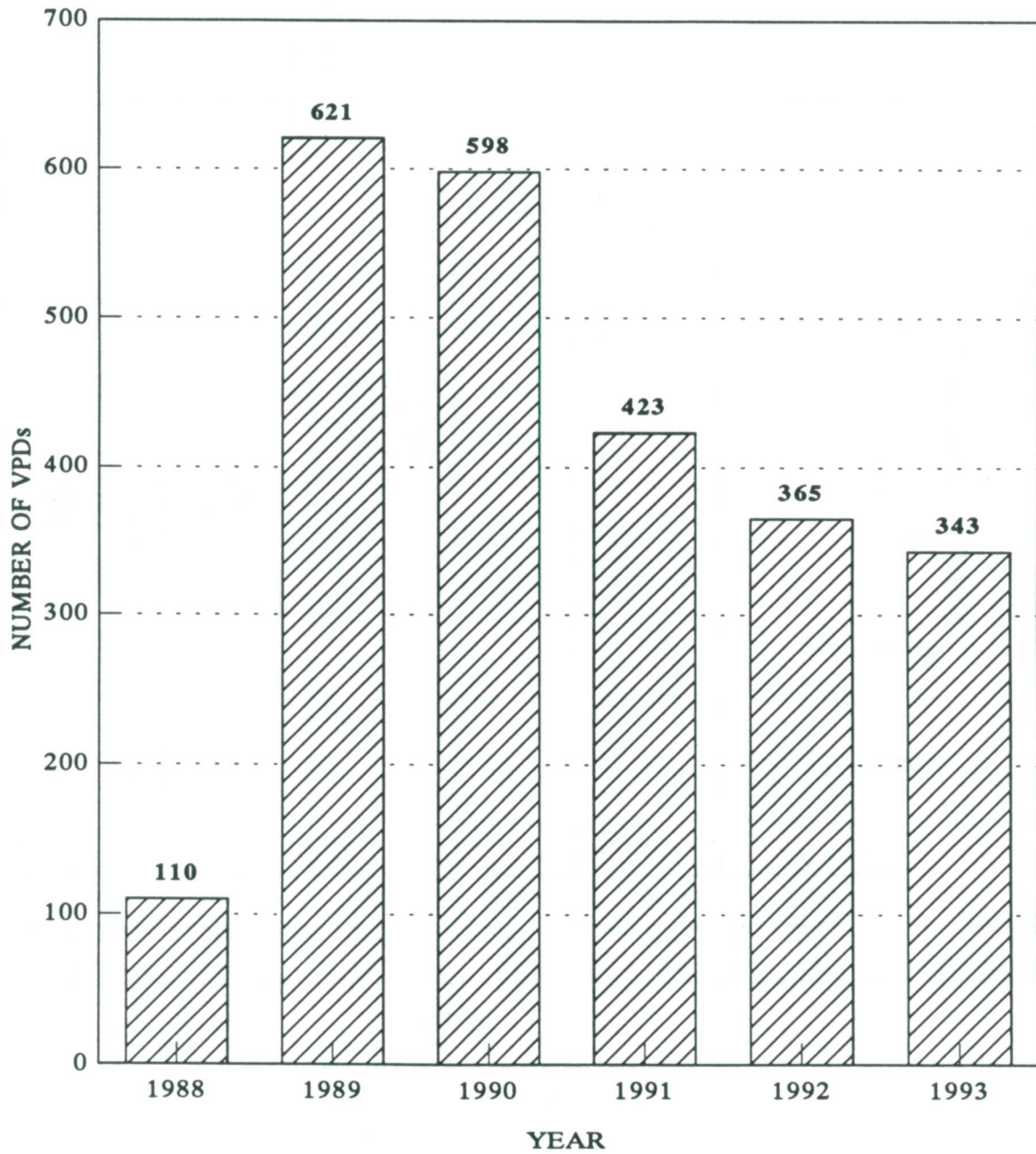
| YEAR | REGION |     |     |     |     |     |     |     |     | TOTAL |
|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|      | AAL    | ACE | AEA | AGL | ANE | ANM | ASO | ASW | AWP |       |
| 1988 | 54     | 132 | 552 | 412 | 100 | 295 | 552 | 271 | 587 | 2955  |
| 1989 | 77     | 146 | 417 | 346 | 92  | 271 | 505 | 243 | 381 | 2478  |
| 1990 | 50     | 121 | 382 | 251 | 93  | 307 | 464 | 203 | 472 | 2343  |
| 1991 | 35     | 69  | 305 | 222 | 73  | 205 | 449 | 133 | 306 | 1797  |
| 1992 | 29     | 69  | 293 | 212 | 83  | 158 | 439 | 156 | 297 | 1736  |
| 1993 | 27     | 54  | 252 | 207 | 59  | 192 | 351 | 157 | 271 | 1570  |



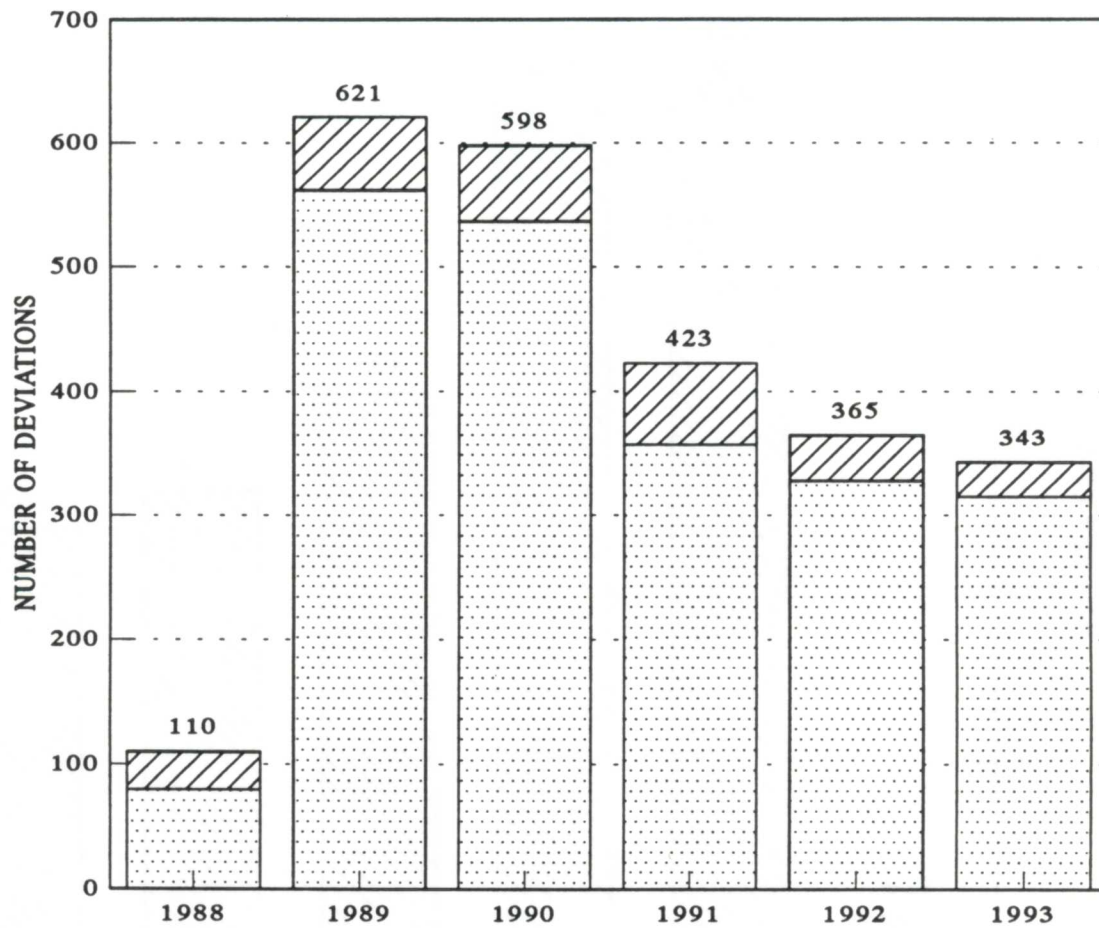
## **VEHICLE/PEDESTRIAN DEVIATIONS \***

\* Vehicle/Pedestrian Deviations may require 90 days to stabilize; therefore, care should be exercised in making statistical comparisons for the most recent 90-day period.

**VEHICLE/PEDESTRIAN DEVIATIONS  
BY YEAR  
1988 through 1993**

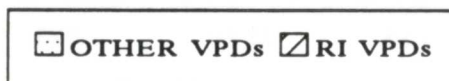


# VEHICLE/PEDESTRAIN DEVIATIONS BY TYPE 1988 through 1993



|            |    |     |     |     |     |     |
|------------|----|-----|-----|-----|-----|-----|
| RI VPDs    | 30 | 60  | 62  | 66  | 37  | 28  |
| OTHER VPDs | 80 | 561 | 536 | 357 | 328 | 315 |

YEAR



**VEHICLE/PEDESTRIAN DEVIATIONS  
BY REGION  
1988 through 1993**

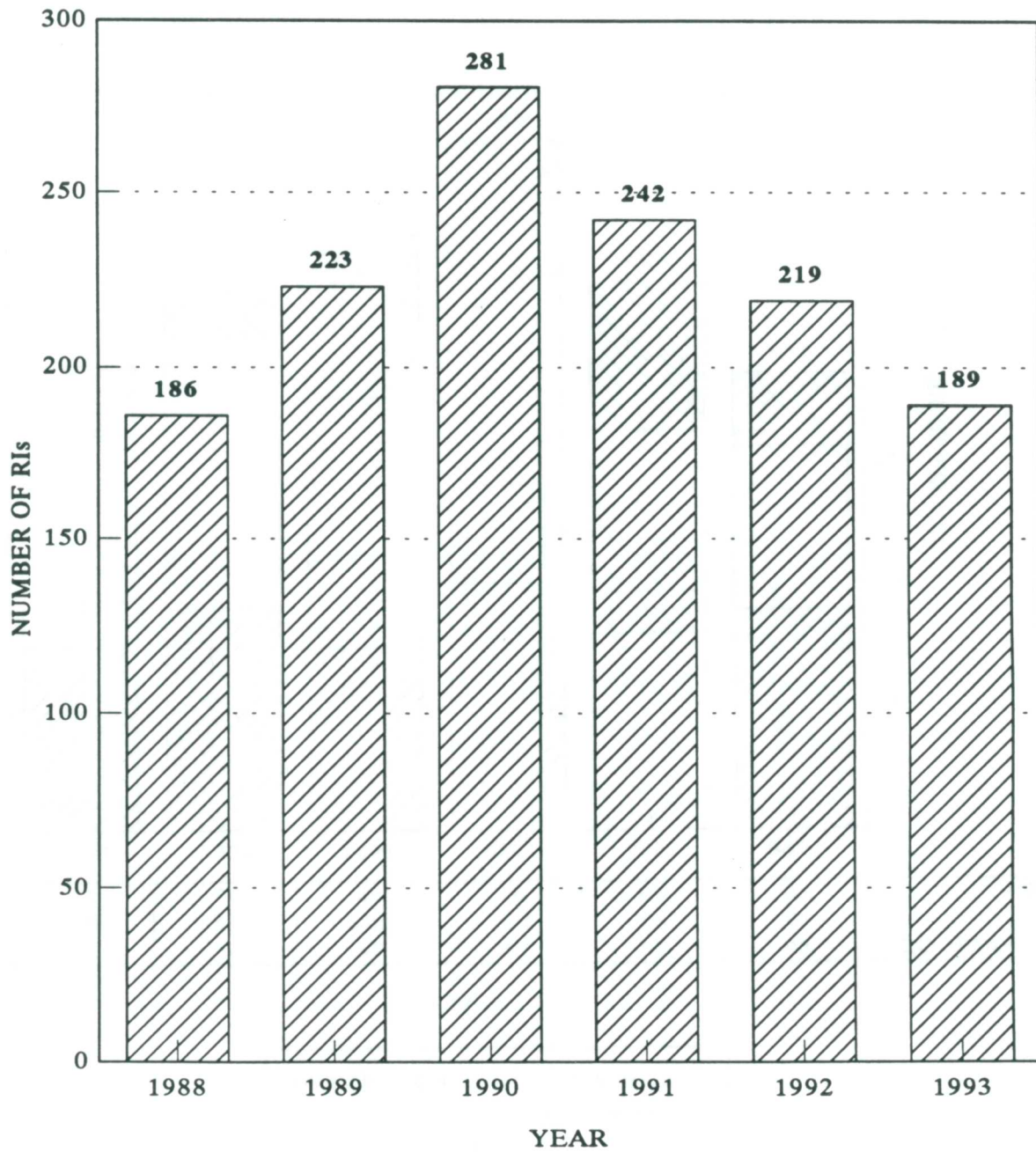
| YEAR | REGION |     |     |     |     |     |     |     |     | TOTAL |
|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-------|
|      | AAL    | ACE | AEA | AGL | ANE | ANM | ASO | ASW | AWP |       |
| 1988 | 1      | 5   | 9   | 15  | 6   | 1   | 62  | 6   | 5   | 110   |
| 1989 | 56     | 12  | 48  | 75  | 25  | 61  | 118 | 86  | 140 | 621   |
| 1990 | 91     | 6   | 44  | 89  | 34  | 22  | 103 | 90  | 119 | 598   |
| 1991 | 63     | 10  | 37  | 80  | 15  | 44  | 53  | 43  | 78  | 423   |
| 1992 | 39     | 9   | 39  | 51  | 13  | 42  | 44  | 49  | 79  | 365   |
| 1993 | 45     | 6   | 33  | 50  | 12  | 25  | 51  | 32  | 89  | 343   |



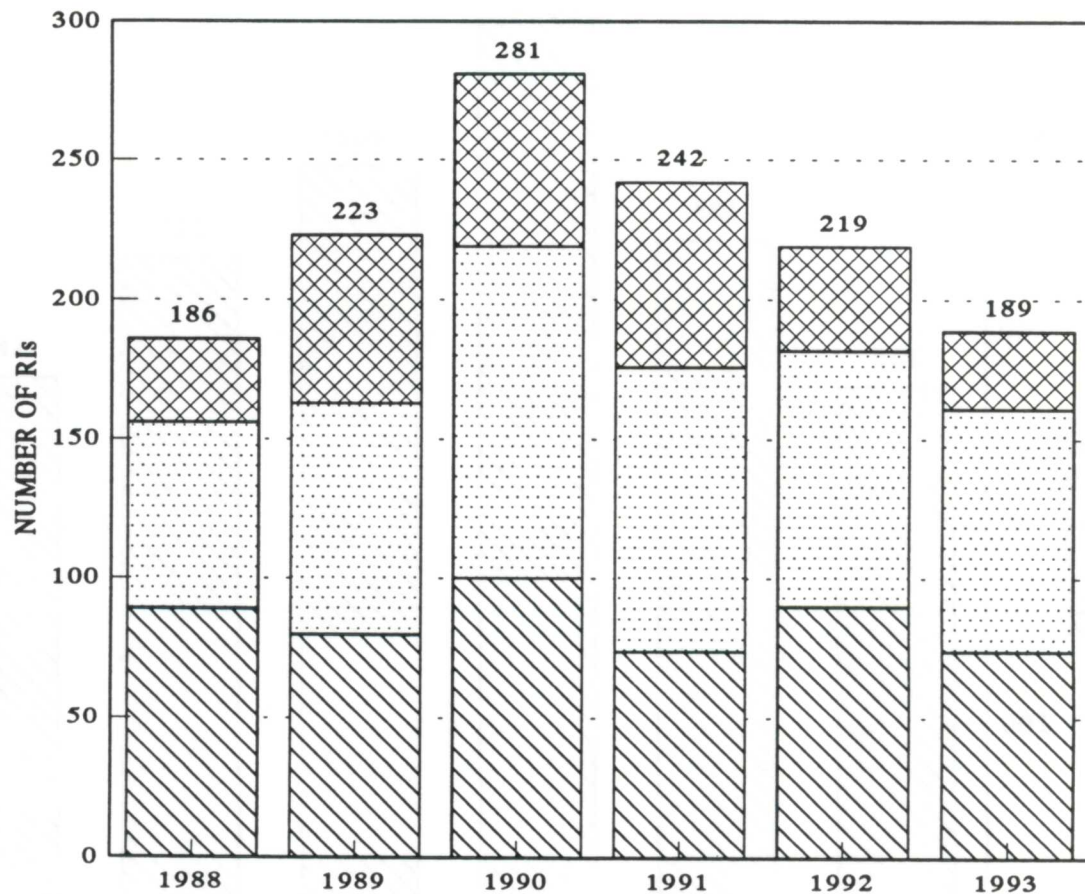
## **RUNWAY INCURSIONS \***

\* Runway Incursions may require 90 days to stabilize; therefore, care should be exercised in making statistical comparisons for the most recent 90-day period.

**RUNWAY INCURSIONS  
BY YEAR  
1988 through 1993**



# RUNWAY INCURSIONS BY TYPE 1988 through 1993



|             |    |    |     |     |    |    |
|-------------|----|----|-----|-----|----|----|
| VPDs        | 30 | 60 | 62  | 66  | 37 | 28 |
| PDs         | 67 | 83 | 119 | 102 | 92 | 87 |
| SURFACE OEs | 89 | 80 | 100 | 74  | 90 | 74 |

YEAR



**RUNWAY INCURSIONS  
TOP AIRPORTS (1993 RANKING)  
1988 through 1993**

| <b>AIRPORT</b>                         | <b>1988</b> | <b>1989</b> | <b>1990</b> | <b>1991</b> | <b>1992</b> | <b>1993</b> |
|----------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Washington National Arpt, DC           | 0           | 0           | 0           | 0           | 2           | 5           |
| Dupage Arpt, IL                        | 0           | 0           | 3           | 0           | 2           | 4           |
| Los Angeles Intl, CA                   | 2           | 2           | 1           | 0           | 2           | 4           |
| San Francisco Intl, CA                 | 0           | 1           | 0           | 3           | 1           | 4           |
| Centennial Arpt, CO                    | 0           | 2           | 1           | 1           | 5           | 3           |
| Essex County Arpt, NJ                  | 0           | 0           | 0           | 0           | 0           | 3           |
| General Edward Lawrence Logan Intl, MA | 0           | 0           | 6           | 6           | 4           | 3           |
| Lancaster Arpt, PA                     | 0           | 0           | 1           | 0           | 1           | 3           |
| Mc Carran Intl, NV                     | 0           | 0           | 0           | 1           | 3           | 3           |
| Nashville Intl, TN                     | 0           | 0           | 0           | 1           | 0           | 3           |
| Palo Alto Arpt, CA                     | 0           | 1           | 1           | 0           | 2           | 3           |
| Portland Intl Jetport Arpt, ME         | 0           | 0           | 0           | 2           | 1           | 3           |
| Salt Lake City Intl, UT                | 0           | 0           | 2           | 1           | 2           | 3           |
| Theodore Francis Green State Arpt, RI  | 1           | 0           | 0           | 2           | 0           | 3           |



# RUNWAY INCURSIONS BY AIRPORT 1992 versus 1993

| AIRPORT                                         | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|-------------------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                                 | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
|                                                 |                     |           |                   |           |                                      |           |           |           |           |           |
| Akron-Canton Regional Arpt, OH                  | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.482     | 0.000     |
| Albert Whitted Arpt, FL                         | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.823     |
| Albuquerque Intl, NM                            | 1                   | 0         | 0                 | 0         | 1                                    | 1         | 2         | 1         | 0.961     | 0.416     |
| Andrews Air Force Base, MD                      | 0                   | 0         | 0                 | 2         | 1                                    | 0         | 1         | 2         | 0.708     | 1.469     |
| Aurora Muni Arpt, IL                            | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.744     | 0.000     |
| Austin Straubel Intl, WI                        | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 1.114     |
| Baltimore-Washington Intl, MD                   | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.348     |
| Bangor Intl, ME                                 | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.835     |
| Barnes Muni Arpt, MA                            | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 1.194     |
| Barnstable Muni-Boardman/Polando Field Arpt, MA | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.745     |
| Baton Rouge Metro, Ryan Field Arpt, LA          | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.700     |
| Bethel Arpt, AK                                 | 1                   | 1         | 0                 | 0         | 0                                    | 0         | 1         | 1         | 0.902     | 0.979     |
| Billings Logan Intl, MT                         | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.871     |
| Birmingham Arpt, AL                             | 0                   | 2         | 0                 | 0         | 0                                    | 0         | 0         | 2         | 0.000     | 1.091     |
| Bishop Intl, MI                                 | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 1.598     |
| Boeing Field/King County Intl, WA               | 4                   | 1         | 0                 | 1         | 0                                    | 0         | 4         | 2         | 0.978     | 0.539     |
| Boise Air Terminal/Gowen Field Arpt, ID         | 0                   | 0         | 3                 | 0         | 0                                    | 0         | 3         | 0         | 1.892     | 0.000     |
| Boston Tracon, MA                               | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | N/A       | N/A       |
| Bowman Field Arpt, KY                           | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.710     | 0.000     |
| Brackett Field Arpt, CA                         | 3                   | 1         | 0                 | 1         | 0                                    | 0         | 3         | 2         | 1.210     | 0.837     |
| Bradley Intl, CT                                | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.149     | 0.000     |
| Brown Field Muni Arpt, CA                       | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.521     | 0.000     |
| Brownsville/South Padre Island Intl, TX         | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 1.509     |
| Burbank-Glendale-Pasadena Arpt, CA              | 1                   | 1         | 0                 | 0         | 0                                    | 0         | 1         | 1         | 0.476     | 0.441     |
| Burke Lakefront Arpt, OH                        | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.432     | 0.000     |
| Capital Arpt, IL                                | 0                   | 0         | 1                 | 1         | 0                                    | 0         | 1         | 1         | 0.906     | 0.864     |
| Capital City Arpt, MI                           | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.676     | 0.000     |
| Cedar Rapids Muni Arpt, IA                      | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 1.268     |
| Centennial Arpt, CO                             | 2                   | 0         | 1                 | 3         | 2                                    | 0         | 5         | 3         | 1.328     | 0.730     |
| Charlotte/Douglas Intl, NC                      | 2                   | 0         | 0                 | 0         | 0                                    | 0         | 2         | 0         | 0.433     | 0.000     |

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

Rates per 100,000 Operations  
N/A = Not Available

# RUNWAY INCURSIONS BY AIRPORT (CON'T) 1992 versus 1993

| AIRPORT                                   | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|-------------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                           | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Cherry Capital Arpt, MI                   | 1                   | 1         | 1                 | 0         | 0                                    | 0         | 2         | 1         | 1.703     | 0.857     |
| Chicago Midway Arpt, IL                   | 0                   | 1         | 2                 | 0         | 0                                    | 0         | 2         | 1         | 1.137     | 0.404     |
| Chicago O'Hare Intl, IL                   | 0                   | 2         | 2                 | 0         | 1                                    | 0         | 3         | 2         | 0.355     | 0.239     |
| Cincinnati/Northern Kentucky Intl, OH     | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.302     |
| Cleveland-Hopkins Intl, OH                | 1                   | 1         | 3                 | 0         | 0                                    | 1         | 4         | 2         | 1.644     | 0.800     |
| Columbia Regional Arpt, MO                | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 2.627     | 0.000     |
| Columbus Metro Arpt, GA                   | 0                   | 0         | 1                 | 1         | 0                                    | 0         | 1         | 1         | 1.332     | 1.363     |
| Corpus Christi Intl, TX                   | 0                   | 0         | 0                 | 2         | 0                                    | 0         | 0         | 2         | 0.000     | 1.578     |
| Cyril E. King Arpt, VI                    | 2                   | 0         | 0                 | 0         | 0                                    | 0         | 2         | 0         | 1.870     | 0.000     |
| Dallas-Ft. Worth Intl, TX                 | 0                   | 0         | 3                 | 2         | 2                                    | 0         | 5         | 2         | 0.654     | 0.244     |
| Danbury Muni Arpt, CT                     | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.742     |
| Dane County Regional-Truax Field Arpt, WI | 0                   | 1         | 1                 | 0         | 0                                    | 0         | 1         | 1         | 0.708     | 0.678     |
| Dannelly Field Arpt, AL                   | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 1.225     | 0.000     |
| David Wayne Hooks Memorial Arpt, TX       | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.563     | 0.000     |
| Daytona Beach Regional Arpt, FL           | 0                   | 1         | 1                 | 1         | 0                                    | 0         | 1         | 2         | 0.353     | 0.718     |
| Des Moines Intl, IA                       | 0                   | 0         | 1                 | 1         | 0                                    | 0         | 1         | 1         | 0.726     | 0.683     |
| Detroit Metro Wayne County Arpt, MI       | 0                   | 2         | 1                 | 0         | 0                                    | 0         | 1         | 2         | 0.234     | 0.436     |
| Dothan Arpt, AL                           | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.894     | 0.000     |
| Dupage Arpt, IL                           | 0                   | 3         | 0                 | 0         | 2                                    | 1         | 2         | 4         | 1.132     | 2.119     |
| Easterwood Field Arpt, TX                 | 2                   | 0         | 0                 | 0         | 0                                    | 0         | 2         | 0         | 3.250     | 0.000     |
| Eppley Airfield Arpt, NE                  | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.320     | 0.000     |
| Ernest A. Love Field Arpt, AZ             | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 0.678     | 0.000     |
| Essex County Arpt, NJ                     | 0                   | 3         | 0                 | 0         | 0                                    | 0         | 0         | 3         | 0.000     | 1.311     |
| Evansville Regional Arpt, IN              | 1                   | 1         | 1                 | 1         | 0                                    | 0         | 2         | 2         | 2.315     | 2.224     |
| Fairbanks Intl, AK                        | 0                   | 0         | 0                 | 0         | 0                                    | 2         | 0         | 2         | 0.000     | 1.562     |
| Fanning Field Arpt, ID                    | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 1.776     |
| Felts Field Arpt, WA                      | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 1.203     |
| Flying Cloud Arpt, MN                     | 1                   | 1         | 0                 | 0         | 0                                    | 0         | 1         | 1         | 0.504     | 0.462     |
| Forbes Field Arpt, KS                     | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 2.088     | 0.000     |
| Fort Smith Muni Arpt, AR                  | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 1.193     | 0.000     |

Rates per 100,000 Operations  
N/A = Not Available

Actual Activity Data thru 8/31/93  
Forecast Activity Data 9/1/93 - 12/31/93

# RUNWAY INCURSIONS BY AIRPORT (CON'T) 1992 versus 1993

| AIRPORT                                 | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|-----------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                         | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Fort Wayne Intl, IN                     | 0                   | 0         | 0                 | 0         | 1                                    | 1         | 1         | 1         | 0.986     | 0.947     |
| Fort Worth Meacham Arpt, TX             | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 0.317     | 0.000     |
| Four Corners Regional Arpt, NM          | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 1.034     |
| Fresno Air Terminal Arpt, CA            | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.528     |
| Friedman Memorial Arpt, ID              | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 1.556     | 0.000     |
| Fullerton Muni Arpt, CA                 | 0                   | 2         | 0                 | 0         | 0                                    | 0         | 0         | 2         | 0.000     | 1.117     |
| Fulton County Arpt-Brown Field Arpt, GA | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.671     |
| General Edward Lawrence Logan Intl, MA  | 1                   | 3         | 3                 | 0         | 0                                    | 0         | 4         | 3         | 0.822     | 0.621     |
| General Mitchell Intl, WI               | 0                   | 1         | 1                 | 0         | 0                                    | 0         | 1         | 1         | 0.493     | 0.499     |
| Gillespie Field Arpt, CA                | 1                   | 0         | 0                 | 1         | 0                                    | 0         | 1         | 1         | 0.496     | 0.528     |
| Grand Forks Intl, ND                    | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.412     | 0.000     |
| Greater Buffalo Intl, NY                | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.725     | 0.000     |
| Greater Peoria Regional Arpt, IL        | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 2.264     |
| Greater Pittsburgh Intl, PA             | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 0.465     | 0.000     |
| Greater Rochester Intl, NY              | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.526     | 0.000     |
| Greater Rockford Arpt, IL               | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.848     |
| Groton-New London Arpt, CT              | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 1.048     | 0.000     |
| Hayward Air Terminal Arpt, CA           | 0                   | 0         | 0                 | 1         | 1                                    | 0         | 1         | 1         | 0.560     | 0.510     |
| Hector Intl, ND                         | 0                   | 1         | 2                 | 0         | 1                                    | 0         | 3         | 1         | 3.424     | 1.141     |
| Honolulu Intl, HI                       | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.248     | 0.000     |
| Houma-Terrebonne Arpt, LA               | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 1.017     |
| Hulman Regional Arpt, IN                | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 2.157     | 0.000     |
| Igor I. Sikorsky Memorial Arpt, CT      | 1                   | 0         | 0                 | 0         | 0                                    | 1         | 1         | 1         | 0.696     | 0.734     |
| Indianapolis Intl, IN                   | 0                   | 1         | 0                 | 0         | 1                                    | 0         | 1         | 1         | 0.396     | 0.429     |
| James M. Cox Dayton Intl, OH            | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.562     |
| Joe Foss Field Arpt, SD                 | 2                   | 0         | 1                 | 0         | 0                                    | 0         | 3         | 0         | 3.175     | 0.000     |
| John F. Kennedy Intl, NY                | 0                   | 0         | 1                 | 0         | 0                                    | 1         | 1         | 1         | 0.293     | 0.290     |
| John Wayne-Orange County Arpt, CA       | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 0.364     | 0.000     |
| Joplin Regional Arpt, MO                | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 2.314     |
| Kalamazoo/Battle Creek Intl, MI         | 0                   | 0         | 1                 | 0         | 1                                    | 0         | 2         | 0         | 2.017     | 0.000     |

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

Rates per 100,000 Operations  
N/A = Not Available



# RUNWAY INCURSIONS BY AIRPORT (CON'T) 1992 versus 1993

| AIRPORT                                              | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|------------------------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                                      | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Kansas City Intl, MO                                 | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.127     | 0.000     |
| Kenai Muni Arpt, AK                                  | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.121     | 0.000     |
| Key West Intl, FL                                    | 0                   | 0         | 0                 | 0         | 0                                    | 2         | 0         | 2         | 0.000     | 2.230     |
| La Guardia Arpt, NY                                  | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 0.298     | 0.000     |
| Lake Charles Regional Arpt, LA                       | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 2.603     | 0.000     |
| Lakefront Arpt, LA                                   | 0                   | 1         | 2                 | 0         | 0                                    | 0         | 2         | 1         | 1.022     | 0.412     |
| Lambert-St. Louis Intl, MO                           | 0                   | 0         | 1                 | 0         | 0                                    | 1         | 1         | 1         | 0.234     | 0.222     |
| Lancaster Arpt, PA                                   | 1                   | 3         | 0                 | 0         | 0                                    | 0         | 1         | 3         | 0.720     | 1.862     |
| Laurence G. Hanscom Field Arpt, MA                   | 1                   | 0         | 0                 | 0         | 1                                    | 0         | 2         | 0         | 0.982     | 0.000     |
| Lawrence Muni Arpt, MA                               | 0                   | 0         | 0                 | 0         | 1                                    | 1         | 1         | 1         | 0.933     | 0.783     |
| Livermore Muni Arpt, CA                              | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.396     | 0.000     |
| Long Island Mac Arthur Arpt, NY                      | 1                   | 1         | 1                 | 1         | 0                                    | 0         | 2         | 2         | 1.002     | 0.943     |
| Los Angeles Intl, CA                                 | 2                   | 3         | 0                 | 1         | 0                                    | 0         | 2         | 4         | 0.294     | 0.594     |
| Lubbock Intl, TX                                     | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.873     |
| Luke Air Force Base, AZ                              | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | N/A       | N/A       |
| Lynchburg Regional/Preston Glenn Field Arpt, VA      | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.657     | 0.000     |
| Mahlon Sweet Field Arpt, OR                          | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 1.450     |
| Manassas Muni/Harry P. Davis Field Arpt, VA          | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.743     | 0.000     |
| Manchester Arpt, NH                                  | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.952     | 0.000     |
| Marthas Vineyard Arpt, MA                            | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 1.730     | 0.000     |
| Mc Carran Intl, NV                                   | 2                   | 1         | 1                 | 1         | 0                                    | 2         | 3         | 3         | 0.729     | 0.665     |
| McGhee Tyson Arpt, TN                                | 0                   | 0         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.683     |
| Memphis Intl, TN                                     | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.282     |
| Merrill Field Arpt, AK                               | 0                   | 0         | 0                 | 0         | 2                                    | 0         | 2         | 0         | 0.924     | 0.000     |
| Metropolitan Oakland Intl, CA                        | 1                   | 0         | 3                 | 0         | 0                                    | 1         | 4         | 1         | 0.965     | 0.219     |
| Miami Intl, FL                                       | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.201     | 0.000     |
| Midland Intl, TX                                     | 0                   | 0         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.942     |
| Minneapolis Center, MN                               | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | N/A       | N/A       |
| Minneapolis-St. Paul Intl/World Chamberlain Arpt, MN | 1                   | 1         | 1                 | 1         | 0                                    | 0         | 2         | 1         | 0.478     | 0.228     |
| Modesto City-County--Harry Sham Field Arpt, CA       | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 1.021     |

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

Rates per 100,000 Operations  
N/A = Not Available



# RUNWAY INCURSIONS BY AIRPORT (CONT) 1992 versus 1993

| AIRPORT                                        | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|------------------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                                | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Monroe County Arpt, IN                         | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 2.817     | 0.000     |
| Montgomery Field Arpt, CA                      | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.428     | 0.000     |
| Morristown Muni Arpt, NJ                       | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.541     | 0.000     |
| Nashville Intl, TN                             | 0                   | 1         | 0                 | 2         | 0                                    | 0         | 0         | 3         | 0.000     | 0.935     |
| Natrona County Intl, WY                        | 0                   | 0         | 0                 | 0         | 1                                    | 1         | 1         | 1         | 2.014     | 1.951     |
| New Hanover Intl, NC                           | 0                   | 1         | 1                 | 0         | 0                                    | 0         | 1         | 1         | 1.320     | 1.279     |
| New Orleans Intl/Moisant Field Arpt, LA        | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.644     |
| Newark Intl, NJ                                | 0                   | 2         | 0                 | 0         | 0                                    | 0         | 0         | 2         | 0.000     | 0.468     |
| Niagara Falls Intl, NY                         | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 1.678     |
| North Las Vegas Air Terminal Arpt, NV          | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.697     | 0.000     |
| Ogden-Hinckley Arpt, UT                        | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.016     | 0.000     |
| Orlando Executive Arpt, FL                     | 0                   | 2         | 0                 | 0         | 0                                    | 0         | 0         | 2         | 0.000     | 1.099     |
| Orlando Intl, FL                               | 1                   | 0         | 0                 | 1         | 0                                    | 0         | 1         | 1         | 0.328     | 0.292     |
| Outagamie County Arpt, WI                      | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 1.220     |
| Palm Beach Intl, FL                            | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.427     |
| Palo Alto Arpt, CA                             | 2                   | 0         | 0                 | 2         | 0                                    | 1         | 2         | 3         | 0.873     | 1.345     |
| Palwaukee Arpt, IL                             | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.698     | 0.000     |
| Panama City-Bay County Arpt, FL                | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 1.766     |
| Philadelphia Intl, PA                          | 3                   | 0         | 0                 | 2         | 1                                    | 0         | 4         | 2         | 1.044     | 0.488     |
| Phoenix Sky Harbor Intl, AZ                    | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.189     |
| Phoenix-Deer Valley Muni Arpt, AZ              | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.453     | 0.000     |
| Piedmont Triad Intl, NC                        | 1                   | 0         | 0                 | 2         | 0                                    | 0         | 1         | 2         | 0.779     | 1.433     |
| Port Columbus Intl, OH                         | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.434     | 0.000     |
| Portland Intl Jetport Arpt, ME                 | 0                   | 3         | 1                 | 0         | 0                                    | 0         | 1         | 3         | 0.819     | 2.300     |
| Portland Intl, OR                              | 1                   | 0         | 0                 | 1         | 2                                    | 0         | 3         | 1         | 1.109     | 0.352     |
| Pueblo Memorial Arpt, CO                       | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 1.151     |
| Quad-City Arpt, IL                             | 1                   | 1         | 1                 | 0         | 1                                    | 0         | 3         | 1         | 3.584     | 1.274     |
| Raleigh-Durham Intl, NC                        | 1                   | 1         | 0                 | 0         | 0                                    | 0         | 1         | 1         | 0.341     | 0.316     |
| Reading Regional/Carl A. Spaatz Field Arpt, PA | 0                   | 0         | 1                 | 0         | 1                                    | 0         | 1         | 0         | 1.084     | 0.000     |
| Reno Cannon Intl, NV                           | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.613     | 0.000     |

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

Rates per 100,000 Operations  
N/A = Not Available

# RUNWAY INCURSIONS BY AIRPORT (CONT) 1992 versus 1993

| AIRPORT                                 | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|-----------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                         | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Renton Muni Arpt, WA                    | 0                   | 0         | 0                 | 0         | 2                                    | 0         | 2         | 0         | 1.425     | 0.000     |
| Richard Lloyd Jones Jr. Arpt, OK        | 1                   | 2         | 0                 | 0         | 0                                    | 0         | 1         | 2         | 0.391     | 0.602     |
| Richmond Intl (Byrd Field), VA          | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.672     | 0.000     |
| Rio Grande Valley Intl, TX              | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.787     | 0.000     |
| Robert Mueller Muni Arpt, TX            | 1                   | 1         | 0                 | 1         | 0                                    | 0         | 1         | 2         | 0.538     | 0.933     |
| Sacramento Metro Arpt, CA               | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.555     |
| Salt Lake City Intl, UT                 | 0                   | 2         | 2                 | 1         | 0                                    | 0         | 2         | 3         | 0.624     | 0.922     |
| San Antonio Intl, TX                    | 1                   | 0         | 2                 | 0         | 0                                    | 0         | 3         | 0         | 1.399     | 0.000     |
| San Diego Intl-Lindbergh Field Arpt, CA | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.465     |
| San Francisco Intl, CA                  | 0                   | 0         | 1                 | 4         | 0                                    | 0         | 1         | 4         | 0.236     | 0.914     |
| San Jose Intl, CA                       | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 0.299     | 0.000     |
| Santa Barbara Muni Arpt, CA             | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.197     | 0.000     |
| Santa Monica Muni Arpt, CA              | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.468     |
| Scottsdale Muni Arpt, AZ                | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.506     | 0.000     |
| Seattle-Tacoma Intl, WA                 | 0                   | 1         | 1                 | 1         | 0                                    | 0         | 1         | 2         | 0.289     | 0.586     |
| Shreveport Regional Arpt, LA            | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 1.216     | 0.000     |
| Sioux Gateway Arpt, IA                  | 1                   | 1         | 0                 | 0         | 0                                    | 0         | 1         | 1         | 1.409     | 1.407     |
| Sonoma County Arpt, CA                  | 0                   | 0         | 0                 | 2         | 0                                    | 0         | 0         | 2         | 0.000     | 1.240     |
| Southern Illinois Arpt, IL              | 0                   | 1         | 1                 | 0         | 0                                    | 0         | 1         | 1         | 1.127     | 1.017     |
| Southwest Georgia Regional Arpt, GA     | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 1.819     | 0.000     |
| Spokane Intl, WA                        | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.800     | 0.000     |
| Springfield Regional Arpt, MO           | 0                   | 1         | 1                 | 0         | 0                                    | 0         | 1         | 1         | 0.868     | 0.985     |
| St. Louis Downtown-Parks Arpt, IL       | 0                   | 1         | 2                 | 0         | 0                                    | 0         | 2         | 1         | 1.319     | 0.657     |
| St. Petersburg/Clearwater Intl, FL      | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.508     |
| Standiford Field Arpt, KY               | 0                   | 1         | 1                 | 1         | 0                                    | 0         | 1         | 2         | 0.652     | 1.213     |
| Stapleton Intl, CO                      | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.168     |
| Syracuse Hancock Intl, NY               | 2                   | 0         | 0                 | 0         | 2                                    | 0         | 4         | 0         | 2.299     | 0.000     |
| Tacoma Narrows Arpt, WA                 | 0                   | 1         | 0                 | 0         | 0                                    | 0         | 0         | 1         | 0.000     | 0.875     |
| Teterboro Arpt, NJ                      | 1                   | 0         | 1                 | 1         | 1                                    | 1         | 3         | 1         | 1.550     | 0.479     |
| Theodore Francis Green State Arpt, RI   | 0                   | 2         | 0                 | 1         | 0                                    | 0         | 0         | 3         | 0.000     | 1.956     |

Actual Activity Data thru 8/31/93  
Forecast Activity Data 9/1/93 - 12/31/93

Rates per 100,000 Operations  
N/A = Not Available

# RUNWAY INCURSIONS BY AIRPORT (CONT) 1992 versus 1993

| AIRPORT                                 | PILOT<br>DEVIATIONS |           | SURFACE<br>ERRORS |           | VEHICLE/<br>PEDESTRIAN<br>DEVIATIONS |           | TOTAL     |           | RATES     |           |
|-----------------------------------------|---------------------|-----------|-------------------|-----------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|
|                                         | '91 - '92           | '92 - '93 | '91 - '92         | '92 - '93 | '91 - '92                            | '92 - '93 | '91 - '92 | '92 - '93 | '91 - '92 | '92 - '93 |
| Tri-City Regional Arpt, TN              | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 1.211     | 0.000     |
| Tucson Intl, AZ                         | 0                   | 0         | 0                 | 1         | 0                                    | 0         | 0         | 1         | 0.000     | 0.385     |
| Tulsa Intl, OK                          | 0                   | 1         | 0                 | 1         | 0                                    | 0         | 0         | 2         | 0.000     | 1.042     |
| University Of Illinois-Willard Arpt, IL | 0                   | 1         | 3                 | 1         | 0                                    | 0         | 3         | 2         | 2.068     | 1.276     |
| Vandenberg Air Force Base, CA           | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | N/A       | N/A       |
| Vero Beach Muni Arpt, FL                | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.500     | 0.000     |
| Washington County Regional Arpt, MD     | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 1.561     |
| Washington National Arpt, DC            | 0                   | 0         | 2                 | 5         | 0                                    | 0         | 2         | 5         | 0.646     | 1.988     |
| Westchester County Arpt, NY             | 0                   | 0         | 1                 | 0         | 0                                    | 0         | 1         | 0         | 0.530     | 0.000     |
| Wheeling Ohio County Arpt, WV           | 0                   | 0         | 0                 | 0         | 1                                    | 0         | 1         | 0         | 2.681     | 0.000     |
| Whiteman Arpt, CA                       | 0                   | 0         | 0                 | 0         | 1                                    | 1         | 1         | 1         | 0.934     | 0.875     |
| Wichita Mid-Continent, KS               | 1                   | 0         | 1                 | 0         | 0                                    | 0         | 2         | 0         | 1.113     | 0.000     |
| Wiley Post Arpt, OK                     | 1                   | 0         | 0                 | 0         | 0                                    | 0         | 1         | 0         | 0.855     | 0.000     |
| Will Rogers World Arpt, OK              | 0                   | 0         | 0                 | 0         | 0                                    | 1         | 0         | 1         | 0.000     | 0.670     |
| William B. Hartsfield Atlanta Intl, GA  | 1                   | 0         | 1                 | 2         | 0                                    | 0         | 2         | 2         | 0.322     | 0.308     |
| William P. Hobby Arpt, TX               | 1                   | 0         | 0                 | 1         | 0                                    | 0         | 1         | 1         | 0.415     | 0.390     |
| Wittman Regional Arpt, WI               | 1                   | 0         | 0                 | 0         | 1                                    | 0         | 2         | 0         | 2.175     | 0.000     |
| TOTAL                                   | 92                  | 86        | 90                | 74        | 37                                   | 28        | 219       | 188       | 0.348     | 0.291     |

Actual Activity Data thru 8/31/93

Forecast Activity Data 9/1/93 - 12/31/93

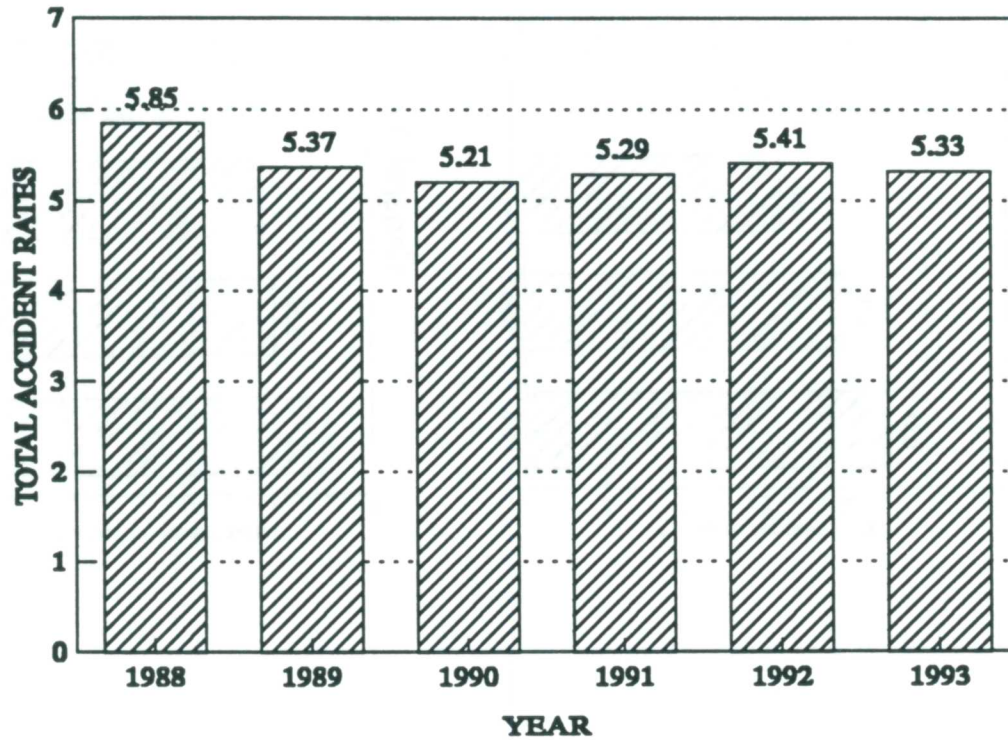
Rates per 100,000 Operations  
N/A = Not Available

## **ACCIDENT DATA \***

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



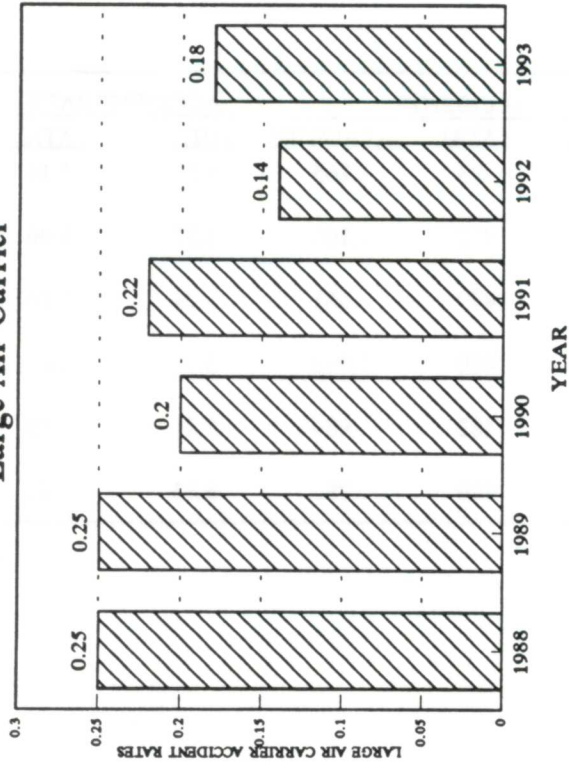
# TOTAL SYSTEM ACCIDENT DATA 1988 through 1993



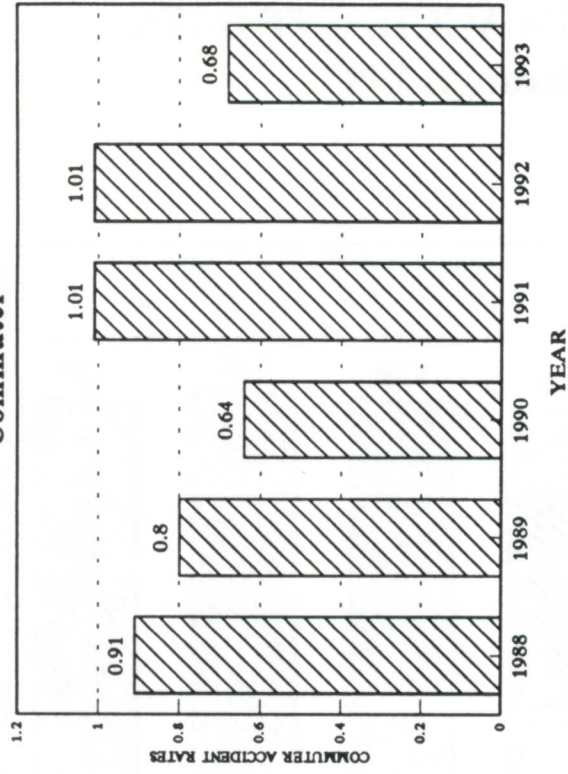
| YEAR | HOURS FLOWN | ACCIDENTS |       |            | ACCIDENT RATE |       |
|------|-------------|-----------|-------|------------|---------------|-------|
|      |             | TOTAL     | FATAL | FATALITIES | TOTAL         | FATAL |
| 1988 | 43,311,237  | 2,535     | 493   | 1,165      | 5.85          | 1.14  |
| 1989 | 44,455,098  | 2,387     | 472   | 1,160      | 5.37          | 1.06  |
| 1990 | 45,246,068  | 2,359     | 479   | 861        | 5.21          | 1.06  |
| 1991 | 43,538,090  | 2,305     | 470   | 1,012      | 5.29          | 1.08  |
| 1992 | 40,478,057  | 2,191     | 482   | 986        | 5.41          | 1.19  |
| 1993 | 39,993,000  | 2,131     | 409   | 782        | 5.33          | 1.02  |

# TOTAL SYSTEM ACCIDENT DATA BY SEGMENT 1988 through 1993

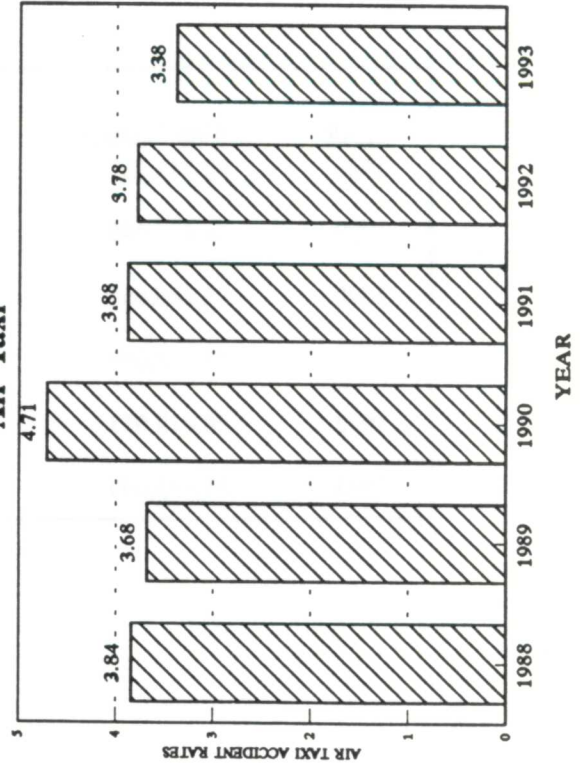
## Large Air Carrier



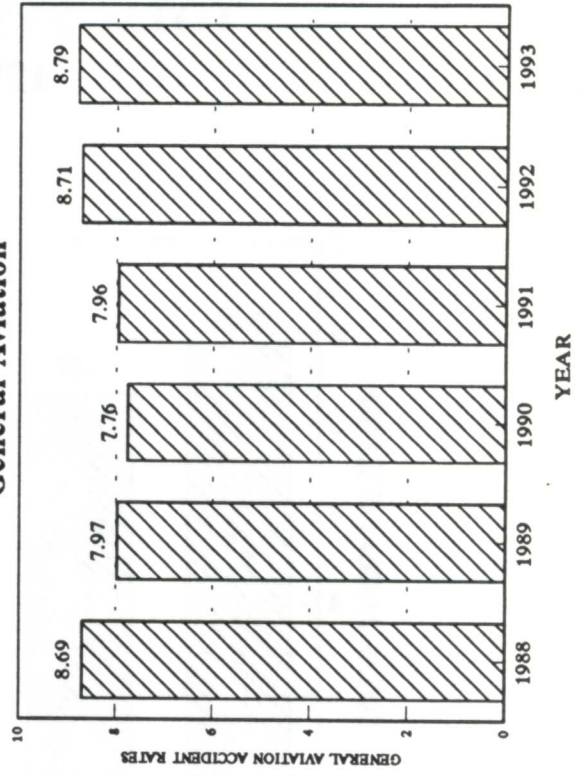
## Commuter



## Air Taxi



## General Aviation



**TOTAL SYSTEM ACCIDENT DATA BY SEGMENT**  
**1988 through 1993**

| SEGMENT           | YEAR | HOURS FLOWN | ACCIDENTS |       |            | ACCIDENT RATES |       |
|-------------------|------|-------------|-----------|-------|------------|----------------|-------|
|                   |      |             | TOTAL     | FATAL | FATALITIES | TOTAL          | FATAL |
| LARGE AIR CARRIER | 1988 | 11,140,548  | 29        | 3     | 285        | 0.25           | 0.02  |
|                   | 1989 | 11,274,543  | 28        | 11    | 278        | 0.25           | 0.10  |
|                   | 1990 | 12,150,116  | 24        | 6     | 39         | 0.20           | 0.05  |
|                   | 1991 | 11,900,023  | 26        | 4     | 62 *       | 0.22           | 0.03  |
|                   | 1992 | 12,495,667  | 18        | 4     | 33         | 0.14           | 0.03  |
|                   | 1993 | 12,524,000  | 23        | 1     | 1          | 0.18           | 0.01  |
| COMMUTER          | 1988 | 2,092,689   | 19        | 2     | 21         | 0.91           | 0.10  |
|                   | 1989 | 2,240,555   | 18        | 5     | 31         | 0.80           | 0.22  |
|                   | 1990 | 2,336,952   | 15        | 3     | 6          | 0.64           | 0.13  |
|                   | 1991 | 2,171,067   | 22        | 8     | 99 *       | 1.01           | 0.37  |
|                   | 1992 | 2,181,390   | 23        | 7     | 21         | 1.01           | 0.32  |
|                   | 1993 | 2,369,000   | 16        | 4     | 24         | 0.68           | 0.17  |
| AIR TAXI          | 1988 | 2,632,000   | 101       | 28    | 59         | 3.84           | 1.06  |
|                   | 1989 | 3,020,000   | 111       | 25    | 83         | 3.68           | 0.83  |
|                   | 1990 | 2,249,000   | 106       | 28    | 50         | 4.71           | 1.24  |
|                   | 1991 | 2,241,000   | 87        | 27    | 70         | 3.88           | 1.20  |
|                   | 1992 | 2,009,000   | 76        | 24    | 70         | 3.78           | 1.19  |
|                   | 1993 | 2,100,000   | 71        | 19    | 42         | 3.38           | 0.90  |
| GENERAL AVIATION  | 1988 | 27,446,000  | 2,386     | 460   | 800        | 8.69           | 1.68  |
|                   | 1989 | 27,920,000  | 2,230     | 431   | 768        | 7.97           | 1.53  |
|                   | 1990 | 28,510,000  | 2,214     | 442   | 766        | 7.76           | 1.55  |
|                   | 1991 | 27,226,000  | 2,170     | 431   | 781        | 7.96           | 1.58  |
|                   | 1992 | 23,792,000  | 2,074     | 447   | 862        | 8.71           | 1.87  |
|                   | 1993 | 23,000,000  | 2,022     | 385   | 715        | 8.79           | 1.67  |

Data Source: NTSB  
Rates are Per 100,000 Hours Flown

\* The fatality total includes the 12 persons killed aboard a Skywest commuter aircraft and the 22 persons killed aboard the USAir airliner when the two aircraft collided.

## **APPENDIX: HISTORICAL DATA**

**NEAR MIDAIR COLLISIONS  
OPERATIONAL ERRORS/DEVIATIONS  
PILOT DEVIATIONS  
VEHICLE/PEDESTRIAN DEVIATIONS  
RUNWAY INCURSIONS  
NTSB ACCIDENT DATA**



# **PILOT REPORTED NEAR MIDAIR COLLISIONS** **1959 through 1987**

| <u>YEAR</u> | <u>TOTAL</u> | <u>SOURCE</u> |  | <u>YEAR</u> | <u>TOTAL</u> | <u>SOURCE</u> |
|-------------|--------------|---------------|--|-------------|--------------|---------------|
| 1959        | 1,112        | 1             |  | 1974        | 285          | 6             |
| 1960        | 470          | 1             |  | 1975        | 269          | 6             |
| 1961        | 516          | 1             |  | 1976        | 373          | 6             |
| 1962        | 549          | 1             |  | 1977        | 384          | 6             |
| 1963        | 626          | 1             |  | 1978        | 504          | 6             |
| 1964        | 536          | 2             |  | 1979        | 540          | 6             |
| 1965        | 559          | 2             |  | 1980        | 568          | 6             |
| 1966-67     | N/A          | 7             |  | 1981        | 394          | 6             |
| 1968        | 2,230        | 3             |  | 1982        | 311          | 6             |
| 1969        | 1,444        | 4             |  | 1983        | 475          | 6             |
| 1970        | 1,456        | 4             |  | 1984        | 589          | 6             |
| 1971        | 1,350        | 4             |  | 1985        | 758          | 6             |
| 1972        | 231          | 5             |  | 1986        | 840          | 6             |
| 1973        | 275          | 6             |  | 1987        | 1,058        | 6             |

**NOTE:** A special program was in effect between 1968 and 1971 which granted immunity to those parties involved in a NMAC if the event was reported to the FAA.

- SOURCES:** (1) Near Midair Collision report for calendar year 1963, FAA, FS-27, March 1964.  
(2) Statistical analysis of the relationship between aircraft Midair Collisions, aircraft near misses, and ATC system errors, FAA, Office of Policy Development, August 1966.  
(3) Near Midair Collision report of 1968, FAA, Air Traffic and Flight Standards Technical Report, July 1969.  
(4) Fact Sheet, FAA, APA, December 1975.  
(5) Fact Sheet, FAA, APA, October 1976.  
(6) FAA Near Midair Collision Database.  
(7) N/A = Not Available.

**OPERATIONAL ERRORS**  
**1980 through 1987**

| TYPE OF OPERATIONAL ERRORS |                 |                |            |              |
|----------------------------|-----------------|----------------|------------|--------------|
| <u>YEAR</u>                | <u>TERMINAL</u> | <u>ENROUTE</u> | <u>FSS</u> | <u>TOTAL</u> |
| 1980                       | 356             | 230            | 0          | 586          |
| 1981                       | 289             | 168            | 0          | 457          |
| 1982                       | 188             | 164            | 1          | 353          |
| 1983                       | 292             | 429            | 2          | 723          |
| 1984                       | 388             | 1497           | 3          | 1888         |
| 1985                       | 412             | 989            | 2          | 1403         |
| 1986                       | 400             | 802            | 0          | 1202         |
| 1987                       | 409             | 789            | 1          | 1199         |

**OPERATIONAL DEVIATIONS**  
**1982 through 1987**

| TYPE OF OPERATIONAL DEVIATIONS |                 |                |            |              |
|--------------------------------|-----------------|----------------|------------|--------------|
| <u>YEAR</u>                    | <u>TERMINAL</u> | <u>ENROUTE</u> | <u>FSS</u> | <u>TOTAL</u> |
| 1982                           | 41              | 25             | 0          | 66           |
| 1983                           | 83              | 42             | 1          | 126          |
| 1984                           | 55              | 63             | 0          | 118          |
| 1985                           | 80              | 55             | 4          | 139          |
| 1986                           | 75              | 72             | 0          | 147          |
| 1987                           | 114             | 101            | 2          | 217          |

**PILOT DEVIATIONS**  
**1985 through 1987**

| <u>1985</u> | <u>1986</u> | <u>1987</u> |
|-------------|-------------|-------------|
| 1814        | 2565        | 3625        |

**VEHICLE/PEDESTRIAN DEVIATIONS \***

**RUNWAY INCURSIONS \***

\* Data not available prior to 1988.

**TOTAL SYSTEM ACCIDENT DATA BY SEGMENT**  
1982 through 1987

| SEGMENT           | YEAR | HOURS FLOWN | ACCIDENTS |       |            | ACCIDENT RATES |       |
|-------------------|------|-------------|-----------|-------|------------|----------------|-------|
|                   |      |             | TOTAL     | FATAL | FATALITIES | TOTAL          | FATAL |
| TOTAL SYSTEM      | 1982 | 33,947,748  | 3,411     | 632   | 1,508      | 10.04          | 1.86  |
|                   | 1983 | 39,602,233  | 3,259     | 589   | 1,157      | 8.23           | 1.49  |
|                   | 1984 | 40,986,561  | 3,201     | 576   | 1,146      | 7.80           | 1.40  |
|                   | 1985 | 40,794,230  | 2,935     | 547   | 1,594      | 7.19           | 1.34  |
|                   | 1986 | 40,197,480  | 2,738     | 510   | 1,044      | 6.81           | 1.27  |
|                   | 1987 | 41,551,453  | 2,659     | 492   | 1,194      | 6.39           | 1.18  |
| LARGE AIR CARRIER | 1982 | 7,040,325   | 20        | 5     | 235        | 0.27           | 0.06  |
|                   | 1983 | 7,298,799   | 24        | 4     | 15         | 0.33           | 0.05  |
|                   | 1984 | 8,165,124   | 17        | 1     | 4          | 0.21           | 0.01  |
|                   | 1985 | 8,709,894   | 22        | 7     | 526        | 0.25           | 0.08  |
|                   | 1986 | 9,976,104   | 24        | 3     | 8          | 0.23           | 0.02  |
|                   | 1987 | 10,645,192  | 36        | 5     | 232        | 0.33           | 0.04  |
| COMMUTER          | 1982 | 1,299,748   | 26        | 5     | 14         | 2.00           | 0.38  |
|                   | 1983 | 1,510,908   | 17        | 2     | 11         | 1.13           | 0.13  |
|                   | 1984 | 1,745,762   | 22        | 7     | 48         | 1.26           | 0.40  |
|                   | 1985 | 1,737,106   | 21        | 7     | 37         | 1.21           | 0.40  |
|                   | 1986 | 1,724,586   | 15        | 2     | 4          | 0.87           | 0.12  |
|                   | 1987 | 1,946,349   | 32        | 10    | 59         | 1.64           | 0.51  |
| AIR TAXI          | 1982 | 3,008,000   | 132       | 31    | 72         | 4.39           | 1.03  |
|                   | 1983 | 2,378,000   | 141       | 27    | 62         | 5.93           | 1.14  |
|                   | 1984 | 2,843,000   | 146       | 23    | 52         | 5.14           | 0.81  |
|                   | 1985 | 2,570,000   | 154       | 35    | 76         | 5.99           | 1.36  |
|                   | 1986 | 2,690,000   | 117       | 31    | 65         | 4.35           | 1.15  |
|                   | 1987 | 2,657,000   | 97        | 30    | 65         | 3.65           | 1.13  |
| GENERAL AVIATION  | 1982 | 29,640,000  | 3,233     | 591   | 1,187      | 10.90          | 1.99  |
|                   | 1983 | 28,673,000  | 3,077     | 556   | 1,069      | 10.73          | 1.94  |
|                   | 1984 | 29,099,000  | 3,016     | 545   | 1,042      | 10.35          | 1.87  |
|                   | 1985 | 28,322,000  | 2,738     | 498   | 955        | 9.66           | 1.75  |
|                   | 1986 | 27,073,000  | 2,582     | 474   | 967        | 9.54           | 1.75  |
|                   | 1987 | 26,972,000  | 2,494     | 447   | 838        | 9.24           | 1.65  |

Data Source: NTSB

Rates are Per 100,000 Hours Flown



**APPENDIX:**

**AVIATION SAFETY HOTLINE STATISTICS**

## AVIATION SAFETY HOTLINE STATISTICS

5-YEAR PERIOD: 9/1/88 - 8/31/93

There were a total of 5,785 calls to the Aviation Safety hotline during the 5-year reporting period.

| <u>YEAR</u> | <u>TOTAL</u> | <u>ENFORCEMENT<br/>ACTIONS INITIATED</u> | <u>OTHER ACTIONS</u> |
|-------------|--------------|------------------------------------------|----------------------|
| 1988-89     | 1,097        | 59                                       | 129                  |
| 1989-90     | 1,051        | 59                                       | 146                  |
| 1990-91     | 1,110        | 93                                       | 139                  |
| 1991-92     | 1,177        | 89                                       | 175                  |
| 1992-93     | 1,350        | 71                                       | 188                  |

The highest categories of the total 5,790 caller reports were:

|                                           |                    |
|-------------------------------------------|--------------------|
| Aircraft Maintenance/<br>Airworthiness    | 1,147 (20 percent) |
| Low-flying Aircraft                       | 707 (12 percent)   |
| Cabin Safety                              | 675 (12 percent)   |
| Flight Safety Standards<br>and Procedures | 610 (11 percent)   |
| Air Traffic                               | 362 (6 percent)    |

In March 1992, 24-hour hotline coverage was initiated with standby duty provided by personnel in the Office of Integrated Safety Analysis. We recently advertised for volunteers in the Office of Aviation Safety to provide standby coverage. Eight individuals volunteered for standby duty, with the Flight Safety Division Manager as a backup. During January 1 through August 31, 1993, 63 callers have been transferred by an FAA duty officer in the headquarters operations center to standby personnel. Two hundred twenty-six other callers elected to leave a report on the hotline recorder after hours.

Examples of the types of issues which have resulted in the initiation of Enforcement Investigative Reports (EIR) follow:

1. A major carrier's first officer's lack of monitoring the airspeeds decreasing resulted in the aircraft experiencing a secondary stall.

2. A pilot with an expired student pilot certificate left a helicopter unattended, with the engine running, while in a parking lot.
3. A hotline call alerted the FAA that a flight attendant occupied the captain's seat during a flight. Consequently, a major carrier's captain had his license revoked, and the captain, the co-pilot, and the flight attendant involved were fired.
4. Airmen were cited for flying low over residences, heavily populated areas, or buzzing boaters on a lake.
5. Several passengers were cited for smoking in aircraft lavatories or interfering with flightcrews.
6. A pilot in command allegedly failed to stop during taxiing to allow a galley door, which appeared not secured, to be recycled.
7. Another EIR was initiated due to continued flight with a cockpit door that would not stay closed/locked closed during transatlantic flights.

A few examples of other actions taken as a result of reports to the Safety hotline are:

1. Review of air traffic procedures and using an incident surrounding a near midair collision as a training aid.
2. Relocation of protective breathing equipment on some B767 aircraft after indications that the installation would create a hazard in an emergency.
3. Development of new flightcrew procedures to require a maintenance logbook entry whenever a circuit breaker is used to clear a problem.
4. Notification of tower light outages resulted in the issuance of a NOTAM where necessary followed by the replacement of the lights.
5. Proper training to prevent cable entanglement by banner-towing operators.
6. The flight attendants will appear before the Cabin Safety Review Committee as a result of their unprofessional behavior and lax safety checks.
7. Revision to a flight attendant manual for a major carrier to provide clear instructions regarding logbook entries after use of an oxygen bottle.



## SUMMARY OF AVIATION SAFETY HOTLINE ACTIVITY

### MAJOR AIR CARRIERS

#### ENFORCEMENT ACTION INITIATED/OTHER ACTIONS

5-YEAR PERIOD: 9/1/88-8/31/93

There were 2,057 air carrier reports to the hotline during this 5-year period. Results of investigations into reports to the hotline resulting in the initiation of enforcement actions or other actions are provided below. The last reporting period is reflected for carriers now out of business (NOTE: This report is arranged alphabetically).

#### American Airlines/American Eagle (AA/AA\*) total calls 434

1. EIR's: Sixty-one for American/American Eagle (14 percent of AA/AA\* total calls). Examples: Passengers smoking in lavatory or cabin (18); interference with a flightcrew (14); cabin not secured for landing, passenger briefings, or carry-on baggage not secured (7); and maintenance issues (5).

NOTE: Many of the 32 smoking or interfering with flightcrew members reports were from American flight attendants in an attempt to assure the airline pursued the issue. A verbal agreement was subsequently reached with a union representative for them to work directly with the FSDO, rather than using the hotline as a method of pursuing investigative followups.

2. Other Actions: Fifty other actions were initiated for American/American Eagle (12 percent of AA/AA\* total calls). Examples: Airworthiness/maintenance issues (11); engine failure due to icing (10 reports concerning same flight); smoking issues; and security screening (9).

#### Atlantic Coast Airlines (DH) total calls 16

1. EIR's: Six for Atlantic Coast Airlines, all from calls received in April 1993 (37 percent of total DH calls). Examples: Unsafe operating procedures during the airline's initial operations (5); and maintenance (1).
2. Other Actions: Six from April 1993 calls (37 percent of total DH calls). Examples: Crew training, ramp operations, and dispatching (4); and maintenance (2).



**NOTE:** Reporting period began in April 1993 for new operations at Dulles. These reports were allegedly provided by company employees who indicated these new operations were being conducted unsafely. There were also indications of a labor dispute following a merger.

**Braniff Airlines (BN) total calls 23**

1. **EIR's:** One report concerning pilot training.
2. **Other Actions:** The same report shown above with issues addressed though an EIR and other actions.

**NOTE:** Reporting period ended April 1991.

**Continental/Continental Express (CO/CO\*) total calls 227**

1. **EIR's:** Seven reports (3 percent of total calls).  
Examples: A pilot's wife flying in cockpit jump seat; nonable-bodied passenger in emergency exit row; airport security and maintenance issues (cockpit door latch, engine throttle, landing gear, and APU).
2. **Other Actions:** Twenty-four reports (9 percent of CO/CO\* total calls). Examples: Passenger safety items concerning lack of passenger information cards and life vests (8); emergency exit row seating; passenger smoking on ramp; restraining devices in galley; a passenger drinking from his/her own liquor bottle; maintenance items; carry-on baggage screening; and employees using drugs.

**Delta Air Lines/Delta Connection (DL/DL\*) total calls 167**

1. **EIR's:** Eight reports (5 percent of DL/DL\* total calls).  
Examples: Flight attendants not prepared/seated for landing (4); emergency exit row seating; serving alcohol to an intoxicated passenger; door not secured; and maintenance (landing gear).
2. **Other Actions:** Twenty-one reports (13 percent of total DL/DL\* reports). Examples: Passengers security during bomb threat (2); unclaimed baggage left on aircraft; abrupt descent (2); windshield installation; ATCS response; cabin not secured for landing (2); and infant seating.

**Eastern Airlines (EA\*) total calls 199**

1. **EIR's:** Eight reports (9 percent of total reports).  
Examples: Maintenance concerning takeoff warning, aileron and tab, engine fire warning system, engine oil problems,

and certification (5); takeoff below minimums; gun undetected by security; and a passenger's refusal to stow large purse.

2. Other Actions: Fourteen reports (7 percent). Examples: Maintenance concerning elevator locks, screen vents, wing damage, and aileron; baggage door unsecured; low visibility go-around; and protruding tabletop jeopardizing flight attendants safety.

NOTE: Eastern Airlines employees went on strike in 1989. The hotline program manager provided a copy of all Eastern's reports to the task force in Flight Standards, as well as a copy to our Congressional liaison office of any Congressional inquiries concerning the strike. The reports for Eastern Airlines ended in September 1990. Thus, the numbers reflected above do not include October 1990 through August 1993 as the other airline reports do.

Northwest Airlines/Northwest Airlink (NW/NW\*) total calls 161

1. EIR's: Thirteen reports (8 percent of NW/NW\* reports). Examples: Maintenance concerning gauges beyond limits, signoffs, cabin door deferral (2); crack in fuselage; flaps up on takeoff; and cabin door opened in flight.
2. Other Actions: Twenty-one reports (13 percent of total NW/NW\* reports). Examples: Maintenance concerning gear pin, engine parts, oil consumption, tires, engine, cargo door lock handle, and certification (7); attempted landing at wrong airport; flight attendants training, seating, unsecured items in door, unprofessionalism/problems with medical oxygen; and stowage of carry-on baggage and stroller.

Pan American World Airways (PA\*) total calls 83

1. EIR's: Five reports (7 percent of total calls). Examples: Maintenance concerning avionics, altering report, certification (3); and unsecured door unreported.
2. Other Actions: Ten reports (12 percent of total calls). Examples: Maintenance concerning broken seat and lack of oxygen mask, rudder, pressurization door seal, ceiling, and overheads (5); security screening (3); and galley door not secured.

NOTE: Reports ended in November 1991. Thus, the period from December 1991 through August 1993 is not reflected in the totals.



Trans World Airlines (TW) total calls 284

1. EIR's: Twelve reports (4 percent of total calls).  
Examples: Maintenance concerning hydraulic leak, broken passenger seat, and certification; flight and duty time; no passenger briefing, seatbelt check, improper loading of meals on aircraft (2); and terminal exit doors inoperative.
2. Other Actions: Fifteen reports (5 percent of total calls). Examples: Maintenance concerning noncompliance with maintenance manual, floor repair, stowage of oxygen masks, improper tools, recurring door problems, and certification; weight and balance-fuel; and unapproved parts screws.

United Airlines/United Express (UA/UA\*) total calls 240

1. EIR's: Eleven reports (4 percent of total calls).  
Examples: First Officer's qualifications; child over 2 years seated on lap; child without seatbelt; smoking in lavatory; flight attendants not seated; passengers not seated on takeoff/landing; problems during emergency evacuation; improper repairs of compressor blade damage and hydraulic brake accumulator; and wing panels came off during takeoff.
2. Other Actions: Twenty-six reports (11 percent of total calls). Examples: Stowage of beverage/serving trays and lack of tiedowns in galleys; airport security screening, including unattended baggage in airport; passengers access to jetway door key; controller badgering pilot in command; aircraft corrosion; airworthiness of parts; and mechanic's work tampered with.

USAir/USAir Express/USAir Shuttle (US/US\*) 281 total reports

1. EIR's: Twelve reports (4 percent of total calls).  
Examples: Maintenance reports concerning alleged "pencil-whipping" of repairs (3); lack of baroscope inspection; inoperative stall warning/stick shaker; nose wheel vibration; EGT system and torque box damage unrepaired; flight attendant flew aircraft; and unauthorized person in cockpit en route.
2. Other Actions: Twenty-nine reports (10 percent of total reports). Examples: Maintenance reports concerning loose engine mounts, engine oil, fuel leak, tail pipe cracks, corrosion, emergency chimes, elevator sticks, oxygen bottle, and calibration of tension meters; flightcrew actions--fake hijacking staged and pilot rocking airplane;

liquid mercury spill in baggage compartment and First Officer's qualifications.

**NOTE:** USAir mechanics went on strike in 1992. Actions of this kind normally increase reports concerning maintenance due to labor/management issues. The hotline program office participated by providing USAir hotline reports as a member of the team in the Flight Standards Service.

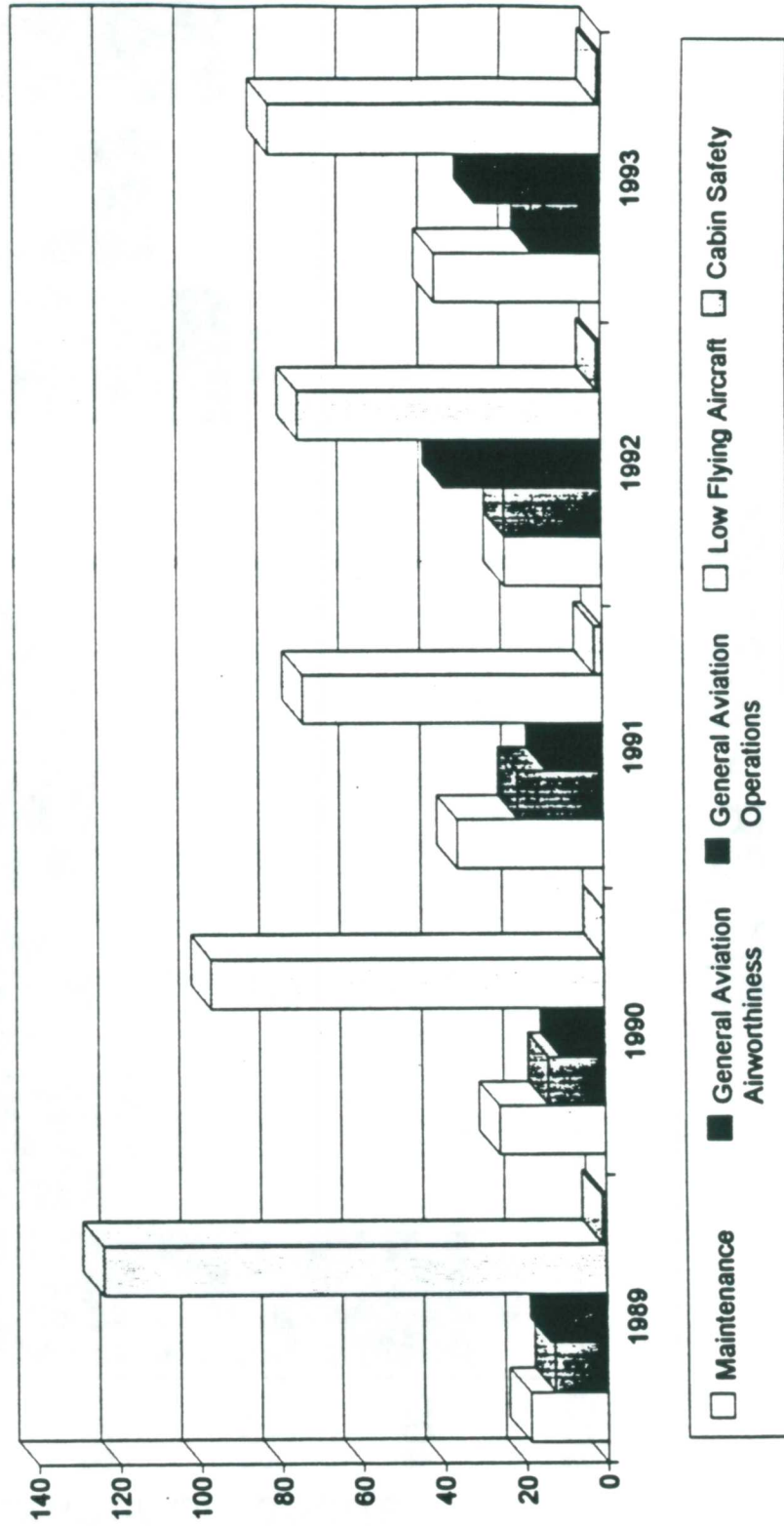


**Aviation Safety Routine  
5-Year Breakdown by Carrier Type and Subject**

|                     | <b>GA</b> | <b>AT/Comm</b> | <b>Air Carrier</b> | <b>Total</b> |
|---------------------|-----------|----------------|--------------------|--------------|
| <b>1989</b>         |           |                |                    |              |
| Maintenance         | 19        | 12             | 135                | 166          |
| Airworthiness       | 13        | 13             | 100                | 126          |
| Operations          | 14        | 17             | 61                 | 92           |
| Low Flying Aircraft | 124       | 1              | 9                  | 134          |
| Cabin Safety        | 1         | 2              | 141                | 144          |
| <b>1990</b>         |           |                |                    |              |
| Maintenance         | 26        | 20             | 75                 | 121          |
| Airworthiness       | 14        | 15             | 121                | 150          |
| Operations          | 11        | 32             | 46                 | 89           |
| Low Flying Aircraft | 97        | 2              | 7                  | 106          |
| Cabin Safety        | 0         | 5              | 129                | 134          |
| <b>1991</b>         |           |                |                    |              |
| Maintenance         | 36        | 18             | 94                 | 148          |
| Airworthiness       | 21        | 6              | 41                 | 68           |
| Operations          | 14        | 16             | 30                 | 60           |
| Low Flying Aircraft | 74        | 3              | 4                  | 81           |
| Cabin Safety        | 2         | 4              | 111                | 117          |
| <b>1992</b>         |           |                |                    |              |
| Maintenance         | 24        | 18             | 81                 | 123          |
| Airworthiness       | 24        | 22             | 99                 | 145          |
| Operations          | 39        | 50             | 60                 | 149          |
| Low Flying Aircraft | 75        | 0              | 5                  | 80           |
| Cabin Safety        | 1         | 5              | 135                | 141          |
| <b>1993</b>         |           |                |                    |              |
| Maintenance         | 41        | 43             | 114                | 198          |
| Airworthiness       | 17        | 17             | 87                 | 121          |
| Operations          | 31        | 70             | 73                 | 174          |
| Low Flying Aircraft | 82        | 0              | 6                  | 88           |
| Cabin Safety        | 1         | 10             | 113                | 124          |

**Aviation Safety Hotline**  
**5-Year Breakdown by Carrier Type and Subject**

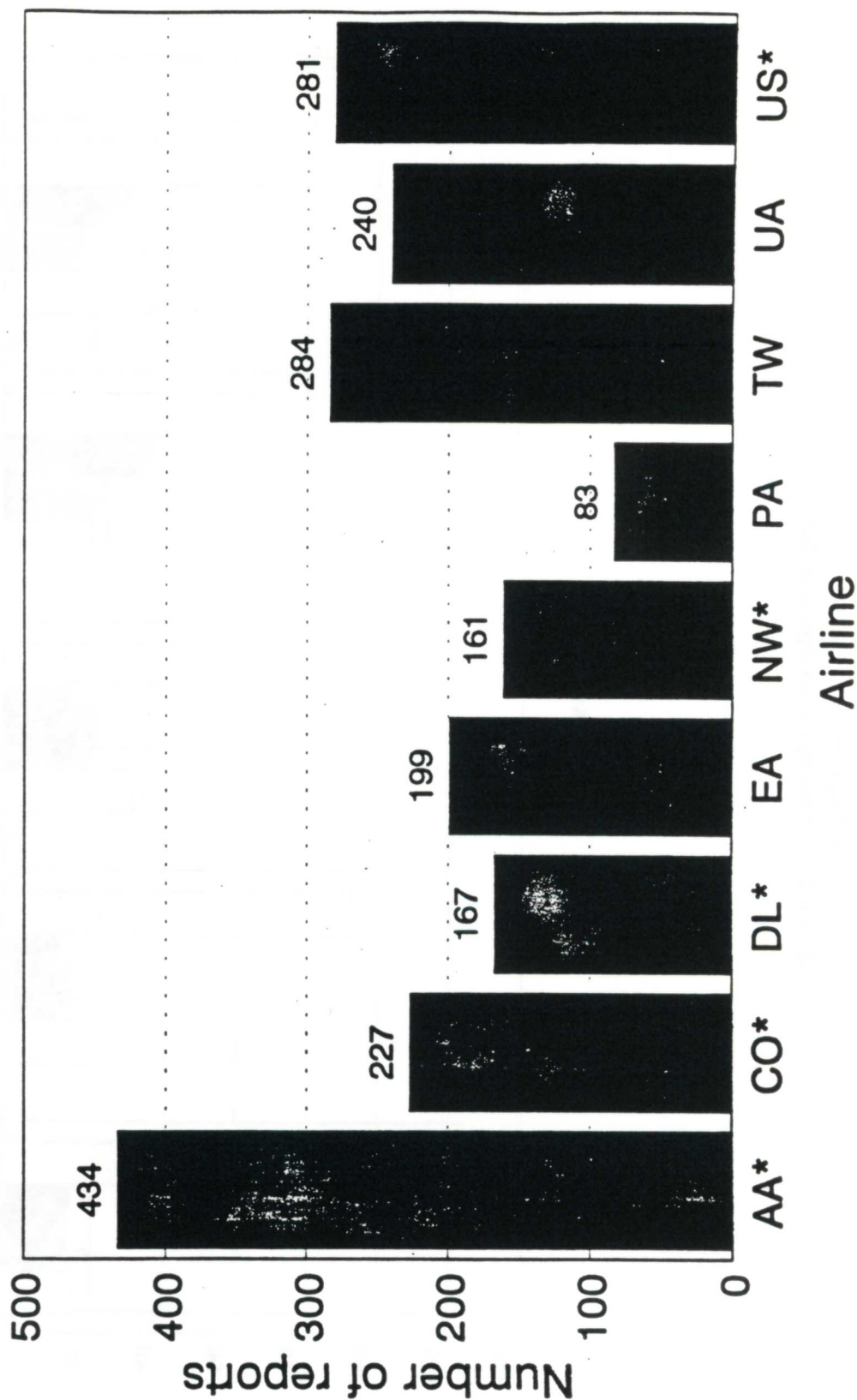
**General Aviation**



# Aviation Safety Hotline Reports

Major Air Carriers

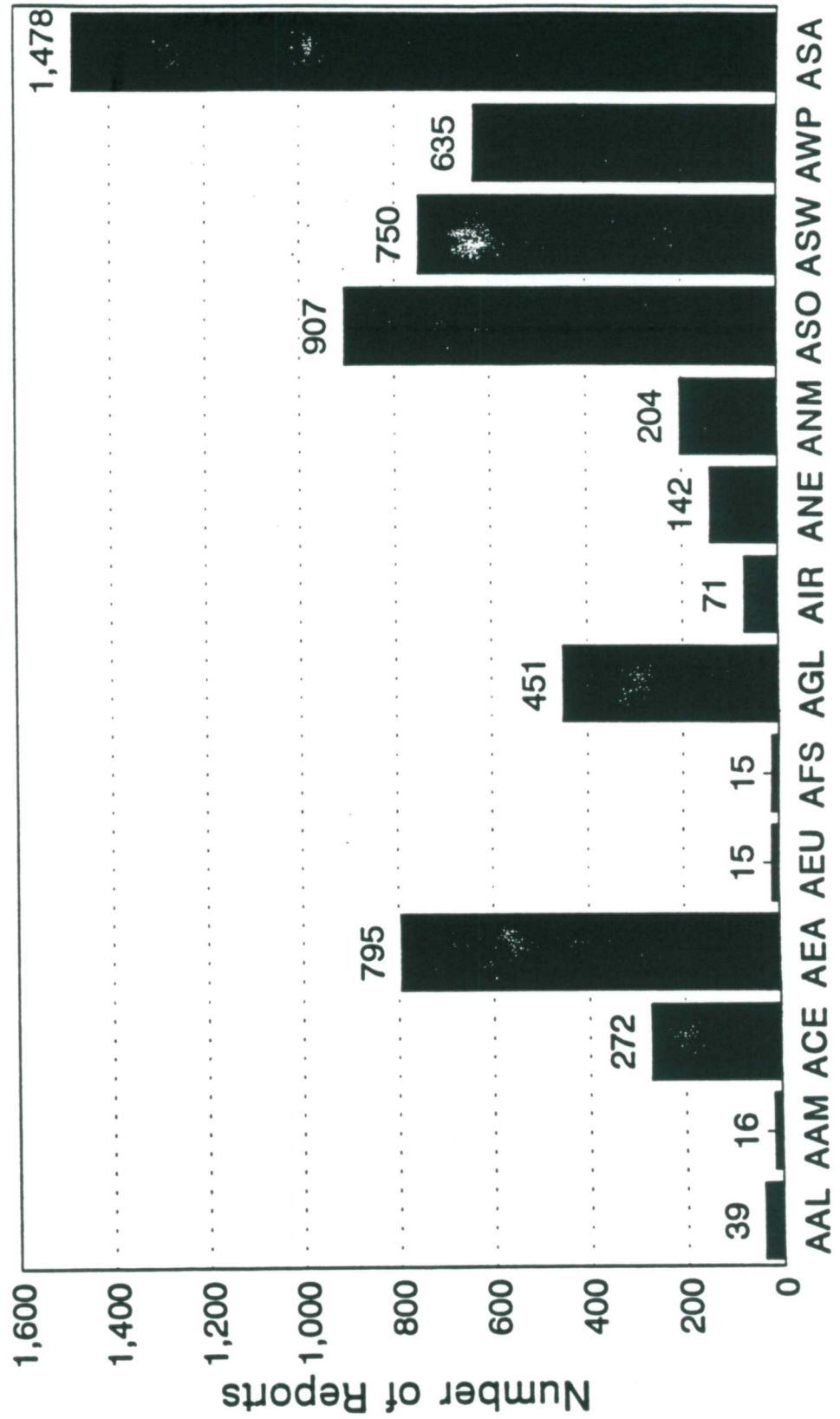
9/1/88 - 8/31/93



# Aviation Safety Hotline Reports

## Action Assignments

9/1/88 - 8/31/93



Region Actioned



## **ACRONYM/ABBREVIATION LIST**

## *ACRONYM/ABBREVIATION LIST*

|               |                                             |
|---------------|---------------------------------------------|
| <i>A/C</i>    | <i>Air Carrier</i>                          |
| <i>AAL</i>    | <i>Alaskan Region</i>                       |
| <i>ACE</i>    | <i>Central Region</i>                       |
| <i>ACT</i>    | <i>Approach Control Tower</i>               |
| <i>AEA</i>    | <i>Eastern Region</i>                       |
| <i>AGL</i>    | <i>Great Lakes Region</i>                   |
| <i>ANE</i>    | <i>New England Region</i>                   |
| <i>ANM</i>    | <i>Northwest Mountain Region</i>            |
| <i>APP</i>    | <i>Approach</i>                             |
| <i>ARSA</i>   | <i>Airport Radar Service Area</i>           |
| <i>ARTCC</i>  | <i>Air Route Traffic Control Center</i>     |
| <i>ASO</i>    | <i>Southern Region</i>                      |
| <i>ASW</i>    | <i>Southwest Region</i>                     |
| <i>ATA</i>    | <i>Airport Traffic Area</i>                 |
| <i>ATC</i>    | <i>Air Traffic Control</i>                  |
| <i>ATCT</i>   | <i>Airport Traffic Control Tower</i>        |
| <i>AWP</i>    | <i>Western Pacific Region</i>               |
| <i>CZ</i>     | <i>Control Zone</i>                         |
| <i>FSS</i>    | <i>Flight Service Station</i>               |
| <i>IFR</i>    | <i>Instrument Flight Rules</i>              |
| <i>N/A</i>    | <i>Not Applicable or Not Available</i>      |
| <i>NMAC</i>   | <i>Near Midair Collision</i>                |
| <i>NONSCH</i> | <i>Nonscheduled</i>                         |
| <i>NTSB</i>   | <i>National Transportation Safety Board</i> |
| <i>OCA</i>    | <i>Other Controlled Airspace</i>            |
| <i>OD</i>     | <i>Operational Deviation</i>                |
| <i>OE</i>     | <i>Operational Error</i>                    |
| <i>OP</i>     | <i>Operational</i>                          |
| <i>PCA</i>    | <i>Positive Control Area</i>                |
| <i>PD</i>     | <i>Pilot Deviation</i>                      |
| <i>PROCS</i>  | <i>Procedures</i>                           |
| <i>RI</i>     | <i>Runway Incursion</i>                     |
| <i>SCH</i>    | <i>Scheduled</i>                            |
| <i>SUA</i>    | <i>Special Use Airspace</i>                 |
| <i>TCA</i>    | <i>Terminal Control Area</i>                |
| <i>TRACON</i> | <i>Terminal Radar Approach Control</i>      |
| <i>VFR</i>    | <i>Visual Flight Rules</i>                  |
| <i>VPD</i>    | <i>Vehicle/Pedestrian Deviation</i>         |

## **GLOSSARY**

## GLOSSARY

### ***Accident***

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

### ***Air Carrier***

*Any air operator operating under FAR Parts 121, 127, or 135.*

### ***Air Route Traffic Control Center (ARTCC)***

*A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance service may be provided to VFR aircraft.*

### ***Air Taxi***

*A class of air carriers, operating pursuant to FAR Part 135, engaged in the nonscheduled air transportation of persons, property, or mail for compensation or hire in aircraft with 30 or less passenger seats and a payload capacity of 7,500 pounds or less. They do not hold certificates of public convenience and necessity and do not hold specific route authority.*

### ***Airport Operations***

*The number of arrivals and departures from the airport at which the airport traffic control tower is located. There are two types of operations: local and itinerant.*

### ***Commuter***

*An FAR Part 135 operator who carries passengers on at least 5 round trips per week or at least 1 route between 2 or more points according to its published flight schedule that specifies the times, days of the week, and places between which those flights are performed.*

### ***General Aviation***

*That portion of civil aviation which encompasses all facets of aviation except air carriers.*



### **Near Midair Collision**

*An incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity of less than 500 feet to another aircraft, or a report is received from a pilot or flight crew member stating that a collision hazard existed between two or more aircraft.*

#### **Degree of Hazard**

**Critical:** *A situation in which collision avoidance was due to chance rather than an act on the part of the pilot. Less than 100 feet of aircraft separation would be considered critical.*

**Potential:** *An incident which would probably have resulted in a collision if no action had been taken by either pilot. Closest proximity of less than 500 feet would usually be required in this case.*

**No Hazard:** *A situation in which direction and altitude would have made a midair collision improbable regardless of evasive action taken.*

### **Open "Near Midair Collisions"**

*Final investigation still underway.*

### **Operational Deviation**

*An occurrence where applicable separation minima as referenced in the operational error definition below were maintained but (1) less than the applicable separation minima existed between an aircraft and protected airspace without prior approval, (2) an aircraft penetrated airspace that was delegated to another position of operation or another facility without prior coordination and approval, or (3) an aircraft penetrated airspace that was delegated to another position of operation or another facility at an altitude or route contrary to the altitude or route requested and approved in direct coordination or as specified in a Letter of Agreement, pre-coordination or internal procedure, (4) an aircraft, vehicle, equipment, or personnel encroached upon a landing area that was delegated to another position of operation without prior coordination and approval.*

### **Operational Error**

*An occurrence attributable to an element of the air traffic control system which results in less than the applicable separation minima between two or more aircraft, or between an aircraft and terrain or obstacles and obstructions as required by Handbook 7110.65 and supplemental instructions. Obstacles include: vehicles/equipment/personnel on runways.*

***Pilot Deviation***

*The actions of a pilot that result in the violation of a Federal Aviation Regulation or a North American Aerospace Defense Command (NORAD) Air Defense Identification Zone (ADIZ) tolerance.*

***Pilot Deviation Air Deviation Types***

*ATC Altitude Clearance Deviation  
ATC Course Clearance Deviation  
Airspeed Violation  
Flying VFR When IFR Required  
Pilot Unqualified for Aircraft or Conditions  
Required Aircraft Equipment Not Operating  
Careless or Reckless Aircraft Operation  
Unauthorized Low Level Flying  
Missed Compulsory Reporting Point  
Noncompliance with Other Regulations*

***Pilot Deviation Airspace Violation Types***

*Class A (formerly Positive Control Area (PCA))  
Class B (formerly Terminal Control Area (TCA))  
Class C (formerly Airport Radar Service Area (ARSA))  
Class D (formerly Airport Traffic Area (ATA) and Control Zone (CZ))  
Class E (formerly General Controlled Airspace)  
Class G (formerly Uncontrolled Airspace)  
Special Use Airspace  
Unknown  
Other*

***Pilot Deviation Surface Deviation Types***

*Takeoff Without Clearance  
Takeoff on Wrong Runway or Taxiway  
Landed Without Clearance  
Landed or Takeoff Below Weather Minimums  
Landed on Wrong Runway, Airport, or Taxiway  
Entered Taxiway or Runway Without Clearance  
Careless or Reckless Aircraft Operation  
Other*

***Pilot Deviation Other Deviation Types***

*Missed Compulsory Reporting Point  
Flying VFR in IFR  
Undeterminable  
Took Another Aircraft's Clearance  
Pilot Did Not Follow ATC Instructions  
Operating in a Careless/Reckless Manner  
Pilot Operating IFR But Not IFR Rated*

***Runway Incursion***

*Any occurrence at an airport involving an aircraft, vehicle, person, or object on the ground that creates a collision hazard or results in loss of separation with an aircraft taking off, intending to take off, landing or intending to land.*

***Terminal Radar Approach Control (TRACON)***

*A Federal Aviation Administration (FAA) air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service may be provided to both civil and military airports. A TRACON is similar to a RAPCON (USAF), a RATCF (USN), and an ARAC (Army).*

***Vehicle/Pedestrian Deviation***

*An entry or movement on an airport movement area by a vehicle operator or pedestrian that has not been authorized by air traffic control (includes aircraft operated by a non-pilot).*

