

# TRANSACTIONS OF SOCIETY OF ACTUARIES 1963 REPORTS

## REPORT OF THE COMMITTEE ON AVIATION AVIATION STATISTICS

**T**HIS report presents primarily new data which have become available during the past year. Data for earlier periods have been included for comparison or to indicate trends. The 1960 report of the Committee includes an index, pages 68-70, covering the most recent information not shown in this report.

### SCHEDULED AIRLINES

#### *United States Airlines*

This category includes all flying by airlines that hold Civil Aeronautics Board certificates of public convenience and necessity to conduct services over specified routes. It includes certain nonscheduled or charter operations by these carriers. In addition to passenger operations, the statistics in this section cover cargo operations of passenger-cargo scheduled airlines but do not include the operations of all-cargo airlines, which are discussed in a later section. In this report, for the first time, intra-Alaska carriers have been included under domestic operations, in accordance with the current practice of the C.A.B. The figures in Table 1, beginning in 1959, have been correspondingly adjusted.

Table 1 shows the recent trend of aviation fatality rates in United States scheduled airlines for passengers, pilots, and other crew members. In domestic flying, the fatality rates which had risen in 1959 and 1960 appear to have returned to their former levels. The passenger and first-pilot fatality rates for the two-year period 1962-63 have been estimated at .0008 per 1,000 passenger hours and at .0012 per 1,000 airplane hours, respectively.

In international flying there have been 13 accidents fatal to passengers and 9 accidents fatal to pilots during the thirteen-year period 1951-63. From these figures it is not possible to draw any significant conclusions as to the trend of aviation fatality rates in international flying. The fatality rates estimated for 1963 result from 1 fatal accident in which 73 passengers, the pilot, co-pilot, and 6 other crew members lost their lives.

The accumulated experience still does not provide an adequate basis for differentiating between the hazards of jet and of propeller-driven aircraft in scheduled flying.

The sections of Table 1 headed "Death Rate of All Pilots Employed in

Scheduled Flying” and “Death Rate of Other Crew Members Employed in Scheduled Flying” include deaths of those who do less than the normal amount of flying on account of having some supervisory duties or for some other reasons and deaths in nonscheduled flights operated by scheduled airlines, such as test or charter flights.

Pilots engaged in scheduled flying may not, under government regulations, fly more than 100 hours per month or 1,000 hours per year in domestic operations. Pilots in international operations are limited either to 100 hours per month or 300 hours every 90 days. In actual practice they aver-

TABLE 1  
UNITED STATES SCHEDULED AIRLINES AVIATION DEATH RATES  
(Number of Fatal Accidents in Parentheses)

|  | 1951-54    | 1955-58    | 1959-62    | 1962*     | 1963 (Est.) |
|--|------------|------------|------------|-----------|-------------|
| Passenger Death Rate per 1,000 Passenger Hours†  |            |            |            |           |             |
| Domestic . . . . .   | .0010 (16) | .0011 (20) | .0015 (23) | .0013 (4) | .0004 (3)   |
| International . . . . .  | .0022 (5)  | .0005 (4)  | .0006 (3)  | .0000 (0) | .0030 (1)   |
| Total . . . . .  | .0012 (21) | .0010 (24) | .0014 (26) | .0010 (4) | .0008 (4)   |
| First-Pilot Death Rate per 1,000 Airplane Hours†   |            |            |            |           |             |
| Domestic . . . . .   | .0016 (16) | .0010 (13) | .0017 (22) | .0013 (4) | .0010 (3)   |
| International . . . . .  | .0011 (2)  | .0004 (1)  | .0014 (3)  | .0000 (0) | .0023 (1)   |
| Total . . . . .  | .0015 (18) | .0010 (14) | .0017 (25) | .0012 (4) | .0012 (4)   |
| Death Rate of All Pilots Employed in Scheduled Flying per Life Year of Exposure‡         |            |            |            |           |             |
| Domestic . . . . .   | .0013 (20) | .0009 (18) | .0012 (30) | .0007 (4) | .0009 (6)   |
| International . . . . .  | .0009 (3)  | .0004 (2)  | .0009 (3)  | .0000 (0) | .0013 (1)   |
| Total . . . . .  | .0012 (23) | .0008 (20) | .0011 (33) | .0006 (4) | .0009 (7)   |
| Death Rate of Other Crew Members Employed in Scheduled Flying per Life Year of Exposure‡ |            |            |            |           |             |
| Domestic . . . . .   | .0011 (16) | .0008 (17) | .0014 (25) | .0013 (5) | .0006 (3)   |
| International . . . . .  | .0019 (3)  | .0007 (2)  | .0012 (3)  | .0000 (0) | .0023 (1)   |
| Total . . . . .  | .0013 (19) | .0008 (19) | .0014 (28) | .0011 (5) | .0009 (4)   |

\* Preliminary.

† Helicopter experience excluded beginning in 1957.

‡ Includes deaths in nonrevenue flights.

NOTE.—Beginning in 1959, intra-Alaska operations are included under domestic operations.

age between 72 and 82 hours flying time a month, with 15-35 hours per month spent in ground duties before and after flights.

During the eight years 1956-63 helicopters flew approximately 53,500,-000 passenger miles in scheduled passenger service. In 1960 a fatal accident took the lives of 11 passengers and 2 crew members. There was another fatal helicopter accident in 1963, in which 3 passengers and 3 crew members were killed. These 2 fatal accidents produced a passenger death rate of .019 per 1,000 passenger hours for the eight-year period 1956-63. A 1961 fatal accident in scheduled helicopter cargo service involved the death of the pilot.

TABLE 2  
SCHEDULED AIRLINES OF  
UNITED STATES AND OTHER COUNTRIES  
PASSENGER AVIATION DEATH RATES  
PER 1,000 PASSENGER HOURS

| PERIOD            | MEMBERS REPORTING<br>TO I.A.T.A.             |                  | ALL UNITED<br>STATES AIRLINES |
|-------------------|--|------------------|-------------------------------|
|                   | Countries Other<br>than the<br>United States | United<br>States |                               |
| 1951-54 . . . . . | .0046  | .0013            | .0012                         |
| 1955-58 . . . . . | .0035  | .0010            | .0010                         |
| 1959-62 . . . . . | .0036  | .0014            | .0014                         |
| 1962 . . . . .    | .0037  | .0010            | .0010*                        |

\* Preliminary.

#### *Airlines of Countries Other than the United States*

The International Air Transport Association furnished the Committee with the experience of most of its members. By making reasonable assumptions as to average speed, the passenger fatality rates per 1,000 passenger hours were derived for both the United States airlines reporting to the I.A.T.A. and for the member airlines of all other countries combined. Nearly 90 per cent of the passenger miles flown by United States scheduled airlines were accumulated by airlines which report to the I.A.T.A.

For comparison, the experience of all United States airlines is also included in Table 2. The passenger fatality rates presented in the table relate to scheduled services only and exclude helicopter service.

At least since 1951, the experience of United States scheduled airlines has been much better than that of airlines of other countries. Only in 1959

was the safety record of other countries' scheduled airlines comparable to that of United States airlines.

*All-Cargo Carriers*

These carriers are primarily engaged in the transportation of freight and express. In recent years the proportion of their services which has been on a scheduled basis has been diminishing, from about 40 per cent in 1960 to 30 per cent in 1961 and further to 19 per cent in 1962. Their nonscheduled services include military-contract operations, which often involve the carrying of troops as well as cargo.

In the seven years 1956-62, 3 pilots lost their lives in scheduled all-cargo service. During this period the first pilot fatality rate for scheduled all-cargo services was .006 per 1,000 airplane hours.

TABLE 3  
 SUPPLEMENTAL CARRIERS OPERATING AIRCRAFT OF  
 MORE THAN 12,500 POUNDS GROSS WEIGHT  
 (Number of Fatal Accidents in Parentheses)

| PERIOD                | PASSENGER       |                                | FIRST PILOT*    |                               |
|-----------------------|-----------------|--------------------------------|-----------------|-------------------------------|
|                       | Aviation Deaths | Rate per 1,000 Passenger Hours | Aviation Deaths | Rate per 1,000 Airplane Hours |
| 1955-58 . . . . .     | 27 (1)          | .001                           | 3               | .004                          |
| 1959-62 . . . . .     | 245 (5)         | .007                           | 6               | .007                          |
| 1962 . . . . .        | 0 (0)           | .000                           | 0               | .000                          |
| 1963 (est.) . . . . . | 95 (1)          | .016                           | 1               | .006                          |

\* Nonpassenger operations included in 1958 and subsequent years.

SUPPLEMENTAL AIRLINES

This category consists of those airlines, formerly called "irregular carriers," which have been awarded certificates of public convenience and necessity allowing limited scheduled service as well as nonscheduled cargo and passenger service. Also included are those irregular carriers operating on a temporary authorization pending final decision on their application for certificate as a supplemental air carrier.

The figures shown in Table 3 for this category include military-contract operations. They are based on mileage reports to the Civil Aeronautics Board and on the assumption of an average speed of 200 miles per hour. This assumption has been tested recently and found still to be valid. There were 151 passenger fatalities in 2 accidents in 1961 but none in 1962. There were in addition 2 pilot fatalities in 1961. These fatal accidents,

together with 2 fatal accidents in 1960, caused the passenger and the first-pilot aviation death rates to rise in the four-year period 1959-62 to .007 and .007, respectively, compared with .001 and .004, respectively, in the four-year period 1955-58. In 1963 there was 1 fatal accident in which 95 passengers and the first pilot and 5 other crew members were killed.

#### GENERAL AVIATION FLYING

General aviation flying represents all domestic civil flying except that performed by the public carriers (scheduled, supplemental, contract, and intrastate air carriers). Annual flying time of the general aviation fleet is almost four times the flying time of the carriers in their domestic flights. The number of hours flown in general aviation is an estimate based on annual surveys of aircraft use. The pilot aviation death rates shown in Table 4 relate to pilots in different kinds of flying and to the average number of hours flown in each.

Pleasure flying accounts for slightly more than one-fifth of the total general aviation flying time but for more than two-fifths of the pilot fatalities. During 1958-61 the fatality rate of pilots in pleasure flying was the highest among the several categories in general aviation. There is reason to believe that these high fatality rates for pleasure flying are substantially accurate. The great excess of these rates over those experienced among insured lives may reflect the much lesser hazards of pleasure flying in the most responsible segment of this category—presumably represented by the class of insured lives.

Somewhat more than two-fifths of the total general aviation flying is in the business category, which accounts for one-fifth of the pilot fatalities and has the lowest pilot death rates. All flying in connection with business or government activities, whether by professional or nonprofessional pilots, is included in this category.

Because of growing interest in "corporate flying" (business flying in planes operated by hired professional pilots), an attempt was made to estimate fatality rates for fixed-wing aircraft weighing over 12,500 pounds used in such operations. Using statistics from Civil Aeronautics Board publications, it appears that during the years 1956-61 the aviation death rate was about .007 per 1,000 pilot hours for pilots and about .007 per 1,000 passenger hours for passengers. Twenty-eight pilot deaths (including co-pilots) and 33 passenger deaths were involved. In calculating these rates, it was assumed (based on some statistical evidence) that 1 plane hour was equivalent to 2 pilot hours and 2.5 passenger hours.

Next to business flying, flight training of civilians presents the most favorable record. The pilot death rate for the years 1958-61 was .024 per

1,000 plane hours. Included are the deaths of the instructor or the student, whoever was acting as pilot when the accident occurred. The hours of instructional flying now represent about one-seventh of the total in general aviation. Single-engine planes are used almost exclusively for this purpose.

TABLE 4  
GENERAL AVIATION FLYING BY KIND  
PILOT AVIATION DEATH RATES PER 1,000 AIRPLANE HOURS

| Period     | Hours<br>(000)     | Aviation<br>Deaths | Rate | Hours<br>(000)  | Aviation<br>Deaths | Rate |
|------------|--------------------|--------------------|------|---|--------------------|------|
|            | Pleasure           |                    |      | Instruction   |                    |      |
| 1958.....  | 2,200*             | 181                | .082 | 2,000*  | 40                 | .020 |
| 1959.....  | 2,600*             | 161                | .062 | 1,900*  | 48                 | .025 |
| 1960.....  | 2,950              | 157                | .053 | 1,700   | 48                 | .028 |
| 1961.....  | 3,160*             | 180                | .057 | 1,670*  | 38                 | .023 |
| 1958-61... | 10,910*            | 679                | .062 | 7,270*  | 174                | .024 |
|            | Business           |                    |      | Commercial (Excluding Aerial<br>Applications) and Miscellaneous |                    |      |
| 1958.....  | 5,300*             | 49                 | .009 | 1,330*  | 42                 | .032 |
| 1959.....  | 5,300*             | 74                 | .014 | 1,320*  | 56                 | .042 |
| 1960.....  | 5,300              | 83                 | .016 | 1,311   | 51                 | .039 |
| 1961.....  | 5,300*             | 78                 | .015 | 1,300*  | 43                 | .033 |
| 1958-61... | 21,200*            | 284                | .013 | 5,260*  | 192                | .036 |
|            | Aerial Application |                    |      |   |                    |      |
| 1958.....  | 872*               | 50                 | .057 |   |                    |      |
| 1959.....  | 880                | 54                 | .061 |   |                    |      |
| 1960.....  | 889                | 32                 | .036 |   |                    |      |
| 1961.....  | 900*               | 38                 | .042 |   |                    |      |
| 1958-61... | 3,540*             | 174                | .049 |   |                    |      |

\* Estimated on the basis of trends.

Commercial flying includes the transportation of passengers and cargo for hire, survey, and patrol activities, aerial application, and such miscellaneous flying as search and rescue work, Civil Air Patrol, etc. This category accounts for less than one-fifth of the total hours in general aviation. The experience in aerial application, the largest subdivision of commercial flying, is shown separately in the table. The pilot fatality rates in aerial application have been higher than in other commercial activities, being estimated at .05 per 1,000 airplane hours for the years 1958-61.

The use of helicopters in general aviation continues to rise. At the end of 1962 there were nearly twice the number of helicopters registered in active use as at the end of 1959. In the four-year period 1959-62 there were 469 accidents involving helicopters in general aviation in the continental United States, excluding Alaska, resulting in 66 fatalities, 35 of them pilots. The corresponding fatality rate for pilots has been estimated at .04 per 1,000 hours flown, and for all persons at .07 per 1,000 hours flown in helicopters. During 1963 there were 12 helicopter pilot deaths in general aviation.

TABLE 5  
CANADIAN SCHEDULED AIRLINES  
AVIATION FATALITY RATES  
(Number of Fatal Accidents in Parentheses)

| Years                | Passenger<br>Fatality Rate<br>per 1,000<br>Passenger Hours | First Pilot<br>Fatality Rate<br>per 1,000<br>Airplane Hours |
|----------------------|--|---|
| 1951-54 .....        | .0032 (3)  | .0036 (3)   |
| 1955-58 .....        | .0028 (4)  | .0029 (3)   |
| 1959-62 .....        | .0004 (2)  | .0008 (1)   |
| 1951-62 .....        | .0017 (9)  | .0022 (7)   |
| 1960-63 (est.) ..... | .0024 (3)  | .0015 (2)   |

#### CANADIAN CIVIL FLYING

Passenger and pilot aviation fatality rates per 1,000 hours in domestic and international operations of Canadian scheduled airlines derived from figures furnished by the Canadian Department of Transport and the Dominion Bureau of Statistics are shown in Table 5. The very favorable experience during the years 1959-62 is based on 2 fatal accidents only. One fatal accident in 1963 took the lives of 111 passengers and 7 crew members.

Pilot aviation fatality rates per 1,000 hours in domestic and international operations of Canadian nonscheduled airlines have been estimated from figures furnished by the Canadian Department of Transport and the Dominion Bureau of Statistics and are shown in Table 6, compared with corresponding fatality rates in scheduled flying (domestic and international).

Canadian scheduled airlines comprise air carriers which serve designated points in accordance with a definite service schedule. Nonscheduled

airlines are those which follow a route pattern with some degree of regularity or operate from a designated base to serve a defined area or on charter of the entire aircraft.

The fatality rates among Canadian civil pilots, by class of license, are shown in Table 7, separately for the periods 1955-58 and 1959-62, based on figures furnished by the Canadian Department of Transport. The pattern of fatality rates is similar to that in last year's report but a somewhat greater improvement is shown this year for pilots with airline transport licenses who, it should be noted, are not necessarily flying for scheduled airlines, since they may engage in other types of flying. Excluded from the experience in Table 7 were persons holding glider licenses only, of

TABLE 6  
 NONSCHEDULED VS. SCHEDULED FIRST-PILOT  
 FATALITY RATES PER 1,000 AIRPLANE HOURS  
 (Number of Fatal Accidents in Parentheses)

| Years        | Nonscheduled | Scheduled |
|--------------|--------------|-----------|
| 1955-58..... | .0322 (45)   | .0029 (3) |
| 1959-62..... | .0155 (22)   | .0008 (1) |
| 1955-62..... | .0238 (67)   | .0017 (4) |

TABLE 7  
 CANADIAN CIVIL PILOTS BY CLASS OF LICENSE  
 1955-62 AVIATION FATALITY RATES

| Class of License                  | Period  | Life Years of Exposure | Aviation Fatalities | Rate per 1,000 Life Years of Exposure |
|-----------------------------------|---------|------------------------|---------------------|---------------------------------------|
| Airline Transport.....            | 1955-58 | 3,425                  | 20                  | 5.8                                   |
|                                   | 1959-62 | 4,950                  | 8                   | 1.6                                   |
| Senior Commercial.....            | 1955-58 | 1,509                  | 10*                 | 6.6                                   |
|                                   | 1959-62 | 1,646                  | 8                   | 4.9                                   |
| Commercial.....                   | 1955-58 | 8,660                  | 48*                 | 5.5                                   |
|                                   | 1959-62 | 9,260                  | 43                  | 4.6                                   |
| Private (excluding students)..... | 1955-58 | 26,693                 | 47†                 | 1.8                                   |
|                                   | 1959-62 | 52,094                 | 79††                | 1.5                                   |

\* Includes 1 missing and presumed dead.

† Includes 1 death as glider pilot in each of the years 1958 and 1959.

‡ Includes 2 missing and presumed dead in each of the years 1960 and 1961 and 1 missing and presumed dead in 1962.



whom there were 534 in 1962 with no fatalities reported in either 1961 or 1962.

UNITED STATES MILITARY

*Age and Rank*

Table 8 shows the 1962 and 1959-62 aviation fatality rates by age group for Air-Force pilots and nonpilot rated officers, and for Navy and Marine Corps aviators on active duty.

Aviation fatality rates of Air-Force rated pilots at ages 25 and over reached a low point in 1960 but increased somewhat in 1961 and again in 1962. At ages under 25, fatality rates continued downward through 1962. However, a four-year moving average of fatality rates indicates a continued downward trend in every age group. Aviation fatality rates at ages 35

TABLE 8  
UNITED STATES AIR FORCE, NAVY, AND MARINE CORPS FLYERS  
AVIATION FATALITY RATES PER 1,000 LIFE YEARS, BY AGE

| AGE GROUP        | AIR-FORCE<br>RATED PILOTS |      | AIR-FORCE<br>NONPILOT RATED<br>OFFICERS |      | NAVY AND MARINE<br>CORPS PILOTS |      |
|------------------|---------------------------|------|---|------|---------------------------------|------|
|                  | 1959-62                   | 1962 | 1959-62                                 | 1962 | 1959-62                         | 1962 |
| Under 25.....    | 3.8                       | 3.3  | 1.3                                     | 1.0* | 9.0                             | 6.8  |
| 25-29.....       | 4.9                       | 5.8  | 3.2                                     | 4.8  | 9.9                             | 8.1  |
| 30-34.....       | 4.2                       | 5.0  | 2.2                                     | 2.7  | 5.7                             | 3.3  |
| 35 and over..... | 1.6                       | 1.7  | 1.5                                     | 1.6  | 2.6                             | 1.7  |
| All.....         | 2.9                       | 3.4  | 2.1                                     | 2.7  | 6.0                             | 4.4  |

\* Based on 5 or fewer deaths.

and over remain significantly lower than those at younger ages. Changes in the age distribution of pilots within duty assignments and the differences in fatality rates according to duty assignment, presented elsewhere in this report, may have been largely responsible for the increase in fatality rates noted at ages 25 and over, since there is no evidence of any real changes in the hazards of military aviation.

Aviation fatality rates of Air-Force nonpilot rated officers have generally increased at ages 25 and over in the past two years. Aviation fatality rates among Air-Force nonpilot rated officers at ages under 35 continue at a distinctly lower level than among rated pilots; this differential is believed to reflect the different character of their respective flying assignments.

Aviation fatality rates of Navy and Marine aviators were lower in 1962

than in any preceding year for which information is available. Although fatality rates among such pilots have shown a wider range of variation by age than among Air-Force pilots, the rates for both are now substantially below the comparable rates of a few years ago.

*Pilots and Other Rated Officers—by Rank*

Aviation fatality rates for Air-Force pilots and other rated officers, according to rank, are shown in Table 9. The generally upward trend in these aviation fatality rates at ages 25 and over, noted in Table 8, is reflected in the higher rates for first lieutenants, captains, and majors in Table 9.

TABLE 9  
UNITED STATES AIR FORCE ON ACTIVE DUTY, BY RANK  
AVIATION FATALITY RATES PER 1,000 LIFE YEARS OF EXPOSURE

| RANK                     | RATED PILOTS |      | NONPILOT RATED OFFICERS |      |
|--------------------------|--------------|------|-------------------------|------|
|                          | 1959-62      | 1962 | 1959-62                 | 1962 |
| 2d Lieutenant.....       | 4.1          | 0.0* | 1.1                     | 0.0* |
| 1st Lieutenant.....      | 5.9          | 8.7  | 3.1                     | 4.5  |
| Captain.....             | 3.1          | 4.1  | 2.1                     | 2.9  |
| Major.....               | 1.4          | 1.7  | 1.5                     | 1.8  |
| Lieutenant Colonel.....  | 1.4          | 1.3  | 0.8*                    | 0.0* |
| General and Colonel..... | 0.5          | 0.9* | 2.8*                    | 0.0* |
| All.....                 | 2.9          | 3.4  | 2.1                     | 2.7  |

\* Based on 5 or fewer deaths.

*Duty Assignment*

The 1962 and 1959-62 aviation fatality rates among Air-Force pilots, according to duty assignment, are given in Table 10. The assignment previously described as "Pilot, Amphibian" is now listed as "Pilot, Search-Rescue"; there have been no fatalities among pilots of such planes since 1956. The category of "All Other Pilots" includes pilots whose duties are primarily administrative.

*Officers on Flying Status—by Age Group and Duty Assignment*

The 1962 distribution of Air-Force officers on flying status by duty assignment and age is shown in Table 11. A comparison with the corresponding distribution for earlier years shows a higher proportion in the age group 30-34 but a generally lower proportion at ages under 30. The cur-

rent distribution also shows a generally higher proportion at ages 40 and over but a lower proportion at ages 35-39.

### *Hours of Flying*

The number of aircraft hours per pilot on flying status in the Air Force was about 120 hours per year in 1962 or the same as in 1961 and slightly lower than in 1960. The average number of flight hours per pilot has been estimated at about double the average number of aircraft hours per pilot.

TABLE 10  
UNITED STATES AIR FORCE ON ACTIVE DUTY  
BY DUTY ASSIGNMENT  
AVIATION FATALITY RATES  
PER 1,000 LIFE YEARS OF EXPOSURE

| Duty Assignment       | 1959-62 | 1962 |
|-----------------------|---------|------|
| Pilot, helicopter     | 1.5*    | 0.0* |
| Pilot, search-rescue  | 0.0*    | 0.0* |
| Pilot, transport      | 2.5     | 5.1  |
| Pilot, troop carrier  | 3.0     | 7.4  |
| Pilot, fighter        | 8.7     | 8.8  |
| Pilot, bomber         | 3.9     | 4.9  |
| Pilot, reconnaissance | 6.8     | 6.3* |
| Pilot, tanker         | 2.1     | 3.1  |
| Operations officer    | 2.0     | 1.6  |
| All other pilots      | 1.4     | 1.6  |
| All                   | 2.9     | 3.4  |

\* Based on 5 or fewer deaths.

TABLE 11  
UNITED STATES AIR FORCE  
1962 DISTRIBUTION OF OFFICERS BY DUTY ASSIGNMENT AND AGE

| DUTY ASSIGNMENT       | AGE      |       |       |       |             |
|-----------------------|----------|-------|-------|-------|-------------|
|                       | Under 25 | 25-29 | 30-34 | 35-39 | 40 and Over |
| Pilot, helicopter     | 9.4%     | 54.2% | 24.4% | 7.2%  | 4.8%        |
| Pilot, search-rescue  | 7.9      | 34.7  | 24.1  | 14.9  | 18.4        |
| Pilot, transport      | 11.6     | 32.0  | 23.4  | 12.4  | 20.6        |
| Pilot, troop carrier  | 13.8     | 36.1  | 25.3  | 9.7   | 15.1        |
| Pilot, fighter        | 8.4      | 41.9  | 34.5  | 10.1  | 5.1         |
| Pilot, bomber         | 3.3      | 34.3  | 26.2  | 17.6  | 18.6        |
| Pilot, reconnaissance | 2.4      | 31.1  | 35.6  | 18.5  | 12.4        |
| Pilot, tanker         | 5.3      | 35.4  | 29.0  | 12.4  | 17.9        |
| Operations officer    | 0.0      | 5.2   | 16.9  | 27.0  | 50.9        |
| All other             | 1.0      | 9.1   | 16.6  | 18.6  | 54.7        |
| All                   | 3.6%     | 20.7% | 21.8% | 17.3% | 36.6%       |

The average number of flight hours per pilot in the Navy and Marine Corps rose to 279 in 1962, compared with 259 in 1959 and in 1960, and 235 in 1961. Inactive Naval Reservists flew an average of 85 hours per year in 1962, which is an increase of 15 hours over the 70 hours in 1961 and in 1960.

The average number of aircraft hours for Army pilots—in fixed-wing and rotary-wing craft combined—was 213 in 1962, compared with 220 in 1960 and 207 in 1961.

*Military Air-Transport Service*

During 1962 there were no passenger fatalities on military carriers in MATS. The passenger fatality rate for the four-year period 1959–62 was 0.40 per 100,000,000 passenger miles.

Aviation fatality rates among pilots and crew members of MATS are shown in Table 12.

TABLE 12  
MILITARY AIR TRANSPORT SERVICE  
AVIATION FATALITY RATES  
PER 1,000 LIFE YEARS OF EXPOSURE

|                      | 7/1/57-<br>6/30/60 | 7/1/60-<br>6/30/63 | 7/1/62-<br>6/30/63 |
|----------------------|--------------------|--------------------|--------------------|
| <i>Pilots:</i>       |                    |                    |                    |
| Transport units..... | 2.4                | 2.1                | 2.3                |
| Other units.....     | 1.9                | 1.0                | 2.9*               |
| All.....             | 2.1                | 1.6                | 2.5                |
| <i>Crew Members:</i> |                    |                    |                    |
| Transport units..... | 2.8                | 2.2                | 1.9                |
| Other units.....     | 4.4                | 1.4                | 0.0*               |
| All.....             | 3.4                | 2.0                | 1.2                |

\* Based on 5 or fewer deaths.

TABLE 13  
UNITED STATES ARMY—ALL FLYING OPERATIONS  
AVIATION FATALITY RATES  
PER 1,000 LIFE YEARS OF EXPOSURE

|                   | 1957-59 | 1960-62 | 1962 |
|-------------------|---------|---------|------|
| Rated pilots..... | 5.2     | 3.9     | 3.9  |
| Crew members..... | 6.1     | 5.7     | 3.2* |

\* Based on 5 or fewer deaths.

*United States Army*

Table 13 shows aviation fatality rates among Army rated pilots and crew members.

Fatality rates among Army rated pilots per 1,000 aircraft hours in rotary- and fixed-wing aircraft are compared in Table 14.

The data in Table 14 are believed to provide a better indication of the relative hazards of helicopter and fixed-wing aircraft flying than those given in Table 10 for Air-Force pilots, inasmuch as helicopters are used more extensively in the Army than in the Air Force. In 1962 the fatality rate per 1,000 aircraft hours for pilots of fixed-wing aircraft was higher than that for pilots of rotary-wing aircraft.

*Student Pilots*

Table 15 shows aviation fatality rates among student pilots in the military services. The 1962 Air-Force rates of 2.9 per 1,000 life years for

TABLE 14  
UNITED STATES ARMY—  
ROTARY- VERSUS FIXED-WING AIRCRAFT  
PILOT FATALITY RATES  
PER 1,000 AIRCRAFT HOURS

|                                 | 1960-62 | 1962  |
|---------------------------------|---------|-------|
| Fixed-wing aircraft . . . . .   | .0174   | .0203 |
| Rotary-wing aircraft . . . . .  | .0193   | .0153 |
| All types of aircraft . . . . . | .0182   | .0181 |

TABLE 15  
UNITED STATES AIR FORCE, NAVY AND MARINE  
CORPS, AND ARMY STUDENT PILOTS  
AVIATION FATALITY RATES  
PER 1,000 LIFE YEARS OF EXPOSURE

|                               | 1955-58 | 1959-62 | 1962 |
|-------------------------------|---------|---------|------|
| <i>Air Force:</i>             |         |         |      |
| Primary course . . . . .      | 2.3     | 3.8     | 2.9  |
| Basic course . . . . .        | 5.8     | 4.4     | 5.4  |
|                               | 1957-59 | 1960-62 | 1962 |
| <i>Navy and Marine Corps:</i> |         |         |      |
| Basic course . . . . .        | 3.2     | 3.0     | 3.0  |
| Advanced course . . . . .     | 7.5     | 12.5    | 6.7* |
| <i>Army</i> . . . . .         | 2.3     | 1.3*    | 2.1* |

\* Based on 5 or fewer deaths.

primary-course pilots and 5.4 for basic-course pilots lie within the range of the average rates for recent four-year periods.

The aviation fatality rate among Navy student pilots in the basic course during 1962 was 3.0 per 1,000 life years, or the same as that for the three-year period 1960-62. For student pilots in the advanced course, however, the 1962 aviation fatality rate of 6.7 (based on 5 or fewer deaths) was lower than the 1961 rate of 11.9 per 1,000 and also lower than the rate of 12.5 per 1,000 for 1960-62.

The United States Army aviation fatality rate continues to vary within a narrow range.

*United States Coast Guard*

Table 16 shows aviation fatality rates among Coast Guard personnel on flight orders. No pilot fatalities were reported in 1962. There have been no fatalities among Coast Guard student pilots or observers during the past six years.

TABLE 16  
 UNITED STATES COAST GUARD PERSONNEL  
 ON FLIGHT ORDERS  
 AVIATION FATALITY RATES  
 PER 1,000 LIFE YEARS OF EXPOSURE\*

| Class              | 1957-59 | 1960-62 | 1962 |
|--------------------|---------|---------|------|
| Pilot.....         | 4.7     | 2.5     | 0.0  |
| Student pilot..... | 0.0     | 0.0     | 0.0  |
| Observer.....      | 0.0     | 0.0     | 0.0  |
| Crew man.....      | 1.0     | 0.5     | 0.8  |

\* All fatality rates based on 5 or fewer deaths.

TABLE 17  
 UNITED STATES NAVY AND MARINE CORPS INACTIVE  
 RESERVISTS ON DRILL PAY STATUS  
 AVIATION FATALITY RATES BY AGE  
 PER 1,000 LIFE YEARS OF EXPOSURE

|                       | 1957-59 | 1960-62 | 1962 |
|-----------------------|---------|---------|------|
| Ages under 30.....    | 3.2     | 2.1     | 4.0  |
| Ages 30 and over..... | 1.5     | 2.1     | 1.1* |
| All ages.....         | 1.9     | 2.1     | 1.9  |

\* Based on fewer than 5 deaths.

*Inactive Reservists*

The fatality rates for Navy and Marine Corps inactive reservists on drill-pay status for 1957-59, 1960-62, and 1962 are shown in Table 17.

*Air National Guard*

The aviation fatality rate among Air National Guard pilots not federally activated was 5.0 per 1,000 life years of exposure during 1962, or higher than the rate for the two preceding years. However, the aviation fatality rate of 4.3 per 1,000 life years for the period 1959-62 continues the downward trend of rates indicated by a four-year moving average.

*Air Force Flight Surgeons and Nurses*

During the period 1959-62 the aviation fatality rate among flight surgeons was 2.4 per 1,000 life years, compared with 2.0 in 1958-61. There were no fatalities among flight nurses during the four-year period 1959-62.

*Graduate of Academies—Assignment to Aviation*

In 1962, 2.3 per cent of the military academy graduates and 2.4 per cent of the naval academy graduates were accepted for flying training by the Air Force.

Of the Air Force academy graduates, 98.2 per cent were commissioned in the Air Force, 0.6 per cent in the Navy, 1.0 per cent in the Marine Corps, and 0.2 per cent in the Army.

The superintendent of the naval academy stated that graduates of the class of 1964 and subsequent classes will be assigned only to the Navy or the Marine Corps.

## ROYAL CANADIAN AIR FORCE

Table 18 shows the 1957-62 aviation fatality rates for pilots and crew members of the RCAF and for pilots of the RCAF Auxiliary (i.e., reserve personnel who undergo weekly training in organized squadrons). The 1957-62 aviation fatality rate for pilots on active duty decreased to 5.1 per 1,000 life years from 6.6 in 1956-61 and 7.2 in 1956-60. The 1957-62 aviation fatality rates for other crew members decreased to 1.9 per 1,000 life years from 2.7 in the period 1956-61. The 1957-62 aviation fatality rates for the RCAF Auxiliary decreased to 2.5 per 1,000 life years from 3.8 in the period 1956-61.

The fatality rates by rank follow patterns similar to those shown in last year's report for both pilots and other crew members.

A comparison of the 1957-62 aviation fatality rates for pilots by function with those for the period 1956-61 shows practically no change for the "fighter" category and a slight reduction for the "training" category.

The aviation fatality rates amongst radio navigators in the Fighter Command was 6.5 per 1,000 life years for 1957-62 as compared with 9.0 for the period 1956-61.

In considering the results shown in Table 18 the comments in last year's report regarding the concentration of RCAF flying exposure in the "fighter" and "training" categories and the relatively small exposure in the "transport" and "maritime" categories, continue to apply and should be kept in mind. Likewise, the movement of pilots and crew from one category to another, which has been commented on in earlier reports, continues.

During the period 1957-62 the aviation fatality rates were .0338 per

TABLE 18  
ROYAL CANADIAN AIR FORCE  
1957-62 AVIATION FATALITY RATES  
PER 1,000 LIFE YEARS OF EXPOSURE

|                                      | REGULAR |            | AUXILIARY PILOT |
|--------------------------------------|---------|------------|-----------------|
|                                      | Pilot   | Other Crew |                 |
| <i>Age Group:</i>                    |         |            |                 |
| Under 25.....                        | 7.3     | 2.5        | 6.2*            |
| 25-29.....                           | 8.4     | 2.8        | 3.0*            |
| 30-34.....                           | 4.6     | 0.0*       | 0.0*            |
| 35-39.....                           | 2.4     | 0.0*       | 0.0*            |
| 40 and over.....                     | 1.8     | 1.0*       | 0.0*            |
| All.....                             | 5.1     | 1.9        | 2.5*            |
| <i>Rank:</i>                         |         |            |                 |
| Flight cadet and pilot officer.....  | 2.4*    | 0.0*       | 12.7*           |
| Flying officer.....                  | 9.0     | 3.5        | 0.9*            |
| Flight lieutenant.....               | 2.4     | 0.0*       | 5.2*            |
| Squadron leader.....                 | 1.4*    | 0.0*       | 0.0*            |
| Wing commander and higher ranks..... | 5.0     | 3.4*       | 0.0*            |
| All.....                             | 5.1     | 1.9        | 2.5*            |
| <i>Function:</i>                     |         |            |                 |
| Fighter.....                         | 8.5     | 6.5        | .....           |
| Training.....                        | 4.2     | 0.3*       | .....           |
| Transport.....                       | 1.0*    | 0.0*       | .....           |
| Maritime.....                        | 0.8*    | 0.0*       | .....           |
| Others.....                          | 3.9     | 0.0*       | .....           |
| All.....                             | 5.1     | 1.9        | .....           |

\* Based on 5 or fewer deaths.

NOTE.—The function classified as "other" is composed largely of pilots whose primary assignment is on the ground but occasionally fly to maintain proficiency. It also includes pilots of the Air Materiel Command who ferry planes to air bases and test new planes, both accepted and experimental models.



1,000 flying hours for RCAF pilots flying jet aircraft and .0062 for pilots flying other aircraft. For crew members, the corresponding rates were .0323 and .0013, respectively.

In 1962 the approximate number of flight hours per pilot was 298 for the RCAF and 169 for the RCAF Auxiliary.

TABLE 19  
ROYAL CANADIAN AIR FORCE  
1962 DISTRIBUTION BY AGE AND DUTY ASSIGNMENT

| FUNCTION                              | PILOTS<br>AGE |       |       |       |                | OTHER AIR CREW<br>AGE |       |       |       |                |
|---------------------------------------|---------------|-------|-------|-------|----------------|-----------------------|-------|-------|-------|----------------|
|                                       | Under<br>25   | 25-29 | 30-34 | 35-39 | 40 and<br>Over | Under<br>25           | 25-29 | 30-34 | 35-39 | 40 and<br>Over |
| By Age Group for Each Duty Assignment |               |       |       |       |                |                       |       |       |       |                |
| Fighter                               | 16%           | 28%   | 17%   | 16%   | 23%            | 24%                   | 40%   | 17%   | 6%    | 13%            |
| Training                              | 49            | 20    | 11    | 7     | 13             | 52                    | 15    | 17    | 8     | 8              |
| Transport                             | 2             | 14    | 20    | 25    | 39             | 21                    | 28    | 28    | 12    | 11             |
| Maritime                              | 6             | 16    | 18    | 29    | 31             | 43                    | 32    | 14    | 6     | 5              |
| Others                                | 1             | 9     | 18    | 19    | 53             | 2                     | 15    | 32    | 19    | 32             |
| By Duty Assignment for Each Age Group |               |       |       |       |                |                       |       |       |       |                |
| Fighter                               | 26%           | 46%   | 36%   | 33%   | 28%            | 17%                   | 35%   | 21%   | 17%   | 28%            |
| Training                              | 70            | 31    | 21    | 13    | 14             | 35                    | 12    | 20    | 21    | 15             |
| Transport                             | 1             | 9     | 16    | 20    | 18             | 8                     | 12    | 18    | 17    | 12             |
| Maritime                              | 2             | 7     | 10    | 16    | 10             | 39                    | 35    | 22    | 20    | 14             |
| Others                                | 1             | 7     | 17    | 18    | 30             | 1                     | 6     | 19    | 25    | 31             |
|                                       | 100%          | 100%  | 100%  | 100%  | 100%           | 100%                  | 100%  | 100%  | 100%  | 100%           |

The 1962 distribution of RCAF pilots and crew members by duty assignment and age is given in Table 19. Compared with the distribution in the 1962 Reports, there is a decreased percentage in the Fighter Command at ages under 25 and an increased percentage at most other ages, including the age group 40 and over.

#### INTERCOMPANY EXPERIENCE

##### *Civilian Aviation*

Tables 20 and 21 show the aviation fatality rates experienced in recent years among civilian pilots on policies issued since January 1, 1946 by the 29 companies contributing part or all of their data on civilian aviation

risks. The experience is by number of policies, and the classification of the insured is according to status at the time of application for insurance. Exposure in the "With Aviation Extra Premium" category is terminated when the extra premium is discontinued. If discontinuance is due to a liberalization of underwriting practices, companies are encouraged to transfer the exposure to the "Without Aviation Extra Premium" classification. Not all companies have been able to do so, and consequently the experience for such policies shown in Table 20 includes only a portion of such cases.

The experience in Table 20 covers the years 1957-62 inclusive and is shown separately for cases "With Aviation Extra Premium" and "Without Aviation Extra Premium." The experience in the "Without Aviation Extra Premium" classifications has generally been more favorable than that in the "With Aviation Extra Premium" classifications. It should be

TABLE 20  
INTERCOMPANY EXPERIENCE ON PILOTS IN CIVILIAN AVIATION\*  
(1957-62 EXPERIENCE—BY POLICIES)

| STATUS AT ISSUE AND<br>HOURS FLOWN IN 12 MONTHS<br>PRECEDING ISSUE | WITH AVIATION<br>EXTRA PREMIUM<br>(1946 and subsequent issues) |                        |                   | WITHOUT AVIATION<br>EXTRA PREMIUM<br>(1955 and subsequent issues) |                        |                   |
|--|--|------------------------|-------------------|---|------------------------|-------------------|
|  | Years of<br>Exposure   | Aviation<br>Fatalities | Rate per<br>1,000 | Years of<br>Exposure  | Aviation<br>Fatalities | Rate per<br>1,000 |
| <i>Scheduled Airline Pilots</i> . . .                              | 8,029  | 24                     | 3.0               | 21,233  | 33                     | 1.6               |
| <i>Other Commercial Pilots<br/>Flying for Hire:</i>                |  |                        |                   |   |                        |                   |
| Instructing (at least<br>half time) . . . . .                      | 5,250  | 19                     | 3.6               | .....   | .....                  | .....             |
| Others . . . . .   | 13,700   | 79                     | 5.8               | 3,160   | 8                      | 2.5               |
| Total . . . . .  | 18,950   | 98                     | 5.2               | 3,160   | 8                      | 2.5               |
| <i>Private Pilots:†</i>  |  |                        |                   |   |                        |                   |
| Less than 100 hours . . .  | 53,842   | 57                     | 1.1               | 49,615  | 50                     | 1.0               |
| 100-199 hours . . . . .  | 23,097   | 63                     | 2.7               | 6,821   | 11                     | 1.6               |
| 200-299 hours . . . . .  | 8,123  | 34                     | 4.2               | 905   | 1                      | .....             |
| 300 or more hours . . . .  | 7,297  | 27                     | 3.7               | 850   | 1                      | .....             |
| Hours not stated . . . . .   | 3,388  | 5                      | 1.5               | 1,318   | 1                      | .....             |
| Total . . . . .  | 95,747   | 186                    | 1.9               | 59,509  | 64                     | 1.1               |

\* Exposure in "With Aviation Extra Premium" category is terminated on discontinuance of extra premium. Exposure in "Without Aviation Extra Premium" category is for pilots apparently active at time of issue who were issued standard (without aviation rider) or reduced to standard because of a liberalization in companies' underwriting rules.

† Pilots flying only for pleasure or personal business (not flying for hire). Includes pilots having commercial or transport certificates and pilots having private certificate and 100 or more solo hours (or solo hours not stated).

noted, however, that even for scheduled airline pilots accepted "Without Aviation Extra Premium," the aviation fatality rate during the 1957-62 period was 1.6 per 1,000, based on 33 deaths, while among other commercial pilots accepted "Without Aviation Extra Premium" it was 2.5 per 1,000, based on 8 deaths. Also, for private pilots flying 100-199 hours and accepted "Without Aviation Extra Premium," the aviation fatality rate for the 1957-62 period was 1.6 per 1,000, based on 11 deaths.

Table 21 shows the experience during the period 1954-62 inclusive, among commercial, transport, and private pilots flying for pleasure or business, but not for hire, (a) by type of flying certificate and (b) by at-

TABLE 21  
INTERCOMPANY EXPERIENCE ON PILOTS FLYING FOR  
PLEASURE OR PERSONAL BUSINESS\*  
WITH AVIATION EXTRA PREMIUM†  
(1954-62 EXPERIENCE ON 1946 AND SUBSEQUENT ISSUES—BY POLICIES)

| HOURS FLOWN IN 12 MONTHS<br>PRECEDING ISSUE | COMMERCIAL OR<br>TRANSPORT CERTIFICATE |                        |                   | PRIVATE CERTIFICATE<br>(WITH 100 OR MORE<br>SOLO HOURS) |                        |                   |
|---|--|------------------------|-------------------|---|------------------------|-------------------|
|   | Years of<br>Exposure                   | Aviation<br>Fatalities | Rate per<br>1,000 | Years of<br>Exposure                                    | Aviation<br>Fatalities | Rate per<br>1,000 |
| Less than 100 hours.....                    | 12,203                                 | 24                     | 2.0               | 54,455  | 45                     | 0.8               |
| 100-199 hours.....                          | 5,625                                  | 13                     | 2.3               | 23,167  | 59                     | 2.5               |
| 200-299 hours.....                          | 3,038                                  | 8                      | 2.6               | 6,860   | 33                     | 4.8               |
| 300 or more hours.....                      | 3,731                                  | 11                     | 2.9               | 4,892   | 23                     | 4.7               |
| Hours not stated.....                       | 731                                    | 3                      | .....             | 3,311   | 5                      | 1.5               |
| Total.....                                  | 25,328                                 | 59                     | 2.3               | 92,685  | 165                    | 1.8               |
|   | Attained Ages under 35‡                |                        |                   | Attained Ages 35 and Over‡                              |                        |                   |
|   | Years of<br>Exposure                   | Aviation<br>Fatalities | Rate per<br>1,000 | Years of<br>Exposure                                    | Aviation<br>Fatalities | Rate per<br>1,000 |
| Less than 100 hours.....                    | 24,260                                 | 36                     | 1.5               | 41,132  | 32                     | 0.8               |
| 100-199 hours.....                          | 8,877                                  | 17                     | 1.9               | 19,368  | 53                     | 2.7               |
| 200-299 hours.....                          | 2,157                                  | 6                      | 2.8               | 7,557   | 33                     | 4.4               |
| 300 or more hours.....                      | 1,859                                  | 5                      | 2.7               | 6,582   | 29                     | 4.4               |
| Hours not stated.....                       | 1,151                                  | 1                      | .....             | 2,871   | 7                      | 2.4               |
| Total.....                                  | 38,304                                 | 65                     | 1.7               | 77,510  | 154                    | 2.0               |

\* Excludes pilots flying for hire. Includes pilots having commercial or transport certificates and pilots having private certificate and 100 or more solo hours or solo hours not stated, flying only for pleasure or personal business.

† Exposure is terminated on discontinuance of extra premium.

‡ Excludes experience of those companies which were unable to split experience by age.

TABLE 22

INTERCOMPANY EXPERIENCE ON PILOTS AND CREW MEMBERS IN  
MILITARY AVIATION—WITH AVIATION EXTRA PREMIUM\*  
(1957-62 EXPERIENCE ON 1946 AND SUBSEQUENT ISSUES—  
BY POLICIES)

| Status at Issue and<br>Attained Insurance Age                | Years of<br>Exposure | Aviation<br>Fatalities | Rate per<br>1,000 |
|--|----------------------|------------------------|-------------------|
| <i>U.S. Air Force Pilots:†</i>                               |                      |                        |                   |
| Under 25.....  | 2,476                | 9                      | 3.6               |
| 25-29.....   | 19,419               | 72                     | 3.7               |
| 30-34.....   | 28,275               | 85                     | 3.0               |
| 35 and over.....   | 103,513              | 218                    | 2.1               |
| Total.....   | 153,683              | 384                    | 2.5               |
| <i>U.S. Army Pilots:†</i>                                    |                      |                        |                   |
| Under 25.....  | 225                  | 1                      | .....             |
| 25-29.....   | 2,180                | 3                      | .....             |
| 30-34.....   | 3,664                | 19                     | 5.2               |
| 35 and over.....   | 17,678               | 19                     | 1.1               |
| Total.....   | 23,747               | 42                     | 1.8               |
| <i>U.S. Air Force and Army Pilots:</i>                       |                      |                        |                   |
| Under 25.....  | 3,082                | 11                     | 3.6               |
| 25-29.....   | 24,393               | 82                     | 3.4               |
| 30-34.....   | 36,972               | 120                    | 3.2               |
| 35 and over.....   | 152,691              | 304                    | 2.0               |
| Total.....   | 217,138              | 517                    | 2.4               |
| <i>U.S. Air Force and Army Crew<br/>Members:</i>             |                      |                        |                   |
| Under 25.....  | 9,079                | 17                     | 1.9               |
| 25-29.....   | 22,873               | 55                     | 2.4               |
| 30-34.....   | 14,184               | 32                     | 2.3               |
| 35 and over.....   | 31,043               | 52                     | 1.7               |
| Total.....   | 77,179               | 156                    | 2.0               |
| <i>U.S. Navy and Marine Pilots:</i>                          |                      |                        |                   |
| Under 25.....  | 1,847                | 24                     | 13.0              |
| 25-29.....   | 11,768               | 115                    | 9.8               |
| 30-34.....   | 18,861               | 90                     | 4.8               |
| 35 and over.....   | 61,848               | 172                    | 2.8               |
| Total.....   | 94,324               | 401                    | 4.3               |
| <i>U.S. Air Force, Army and Navy<br/>Reserve Pilots.....</i> | 10,323               | 18                     | 1.7               |
| <i>U.S. Air National Guard Pilots.....</i>                   | 3,565                | 12                     | 3.4               |

\* Exposure is terminated on discontinuance of extra premium.

† Excludes experience of those companies which were unable to split experience between Air Force and Army.

tained age, in each case according to the hours flown in the 12 months preceding issue. Among private pilots flying less than 100 hours per year, the experience has been distinctly more favorable for pilots with private certificates than for pilots with commercial or transport certificates, and more favorable at attained ages 35 and over than at attained ages under 35. On the other hand, among private pilots flying 100 or more hours per year, the experience has been more favorable for pilots with commercial or transport certificates and also at attained ages under 35 as compared with attained ages 35 and over.

TABLE 23  
INTERCOMPANY EXPERIENCE ON PILOTS IN MILITARY AVIATION—  
WITH AVIATION EXTRA PREMIUM\*  
(1957-62 EXPERIENCE—BY POLICIES)

| HOURS FLOWN IN 12 MONTHS<br>PRECEDING ISSUE<br>(1953 AND SUBSE-<br>QUENT ISSUES) | U. S. AIR FORCE AND ARMY |                        |                   | U. S. NAVY AND MARINES |                        |                   |
|--|--------------------------|------------------------|-------------------|------------------------|------------------------|-------------------|
|  | Years of<br>Exposure     | Aviation<br>Fatalities | Rate per<br>1,000 | Years of<br>Exposure   | Aviation<br>Fatalities | Rate per<br>1,000 |
| <i>40-150 Hours:</i>   |                          |                        |                   |                        |                        |                   |
| Ages 30-34.....  | 7,298                    | 24                     | 3.3               | 4,184                  | 19                     | 4.5               |
| Ages 35 and over.....  | 36,074                   | 62                     | 1.7               | 13,836                 | 33                     | 2.4               |
| Total.....   | 43,372                   | 86                     | 2.0               | 18,020                 | 52                     | 2.9               |
| <i>Over 150 Hours:</i>   |                          |                        |                   |                        |                        |                   |
| Ages 30-34.....  | 22,349                   | 76                     | 3.4               | 10,112                 | 45                     | 4.5               |
| Ages 35 and over.....  | 46,429                   | 121                    | 2.6               | 16,904                 | 55                     | 3.3               |
| Total.....   | 68,778                   | 197                    | 2.9               | 27,016                 | 100                    | 3.7               |

\* Exposure is terminated on discontinuance of extra premium.

### *Military Aviation*

Table 22 shows, for the 26 companies which contributed their experience on military aviation, the aviation fatality rates during the years 1957-62 inclusive among military aviation personnel on policies issued since January 1, 1946, with an aviation extra premium. The experience is by number of policies, and the classification of the insured is according to status at the time of application for insurance. Exposure was terminated when the extra premium was discontinued.

Table 22 indicates little or no change in the aviation fatality rates of United States Air Force and Army pilots and crew members as compared with the 1957-61 experience reported last year. Inasmuch as some of the contributing companies were not able to subdivide their data according to

branch of service, the combined experience for United States Air Force and Army pilots includes not only the data contributed separately for each service but also data for which the particular branch of service was not given. The experience among United States Air Force crew members has not been shown separately from that among United States Army crew members because there was only one death among United States Army crew members.

The experience on United States Navy and Marine pilots indicates slightly lower aviation fatality rates during the 1957-62 period than in 1957-61, the experience for which period was shown in last year's report. United States Navy and Marine pilots at ages under 30 in recent years have experienced significantly higher aviation fatality rates than United States Air Force and Army pilots at these ages.

Table 23 shows a further subdivision of the experience on pilots in military aviation at attained ages 30 and over according to the number of annual flying hours reported at time of issue—for issues of 1953 and later years only. The table shows that for ages 35 and over aviation fatality rates are higher for pilots who flew more than 150 hours during the year preceding issue than for pilots who flew not more than 150 hours; fatality rates have continued to be lower for those at attained ages 35 and over than for those at ages 30-34.