

United States Department of Agriculture

Forest Service



FY 2006

Aviation Safety Summary

Prepared by the
National Aviation Safety Center
Boise, ID

Table of Contents

| | |
|--|-----------|
| Executive Summary | 2 |
| Aviation Safety Accomplishments | 4 |
| Statistical Summary | 6 |
| USFS Owned Aircraft Statistics | 13 |
| Fixed-Wing Statistics | 15 |
| Airtanker Statistics | 17 |
| Helicopter Statistics | 19 |
| SAFECOM Summary | 21 |
| Accident Summary | 31 |

NOTE: Formulas used: Industry standard “per 100,000 hours flown”

Accident Rate = Number of accidents divided by the number of hours flown times 100,000.

Fatal Accident Rate = Number of fatal accidents divided by the number of hours flown times 100,000.

Fatality Rate = Number of fatalities divided by the number of hours flown times 100,000.

Departure Accident Rate = Number of accidents divided by the number of departures times 100,000

Executive Summary

Generally, the end of each fiscal year is greeted with a sigh of relief quickly followed by a mental tally of aviation accidents and incidents. The US Forest Service, Aviation Risk Management Center monitors aircraft mishaps, coordinates investigations that inevitably follow, and tracks corrective actions as part of a more comprehensive prevention program. It is not necessarily rocket science, but the stakes are high and results at the end of the year translate to lives saved.

In retrospect, 2006 with four accidents was slightly better than the statistical “average” year for the number of aircraft accidents. Unfortunately we lost six people in two of those accidents, that number being higher than average. In either measure we fell short of the zero accident goal

By themselves, the numbers of accidents and fatalities do not tell the whole story. Accident rates are a more useful tool than raw numbers for analyzing trends. The standard measure for aviation accident data is the number of accidents per 100,000 flight hours per year. In 2006 the number of hours flown by all Forest Service (FS) aircraft totaled 89,648 and during that time we incurred four accidents. Simple division of the hours into the number 4 gives us .0000446, multiplied by 100K gives us the annual accident rate of 4.46. The same process is applied to arrive at the rate for fatal accidents, revealing a rate of 2.23.

When comparing these numbers with the 10 year average for the period between 1997 and 2006 we find that last year’s flight hours are about 9% higher than the average of 78,910, the accident rate is lower than the average of 5.56, but the fatal accident rate in 2006 is nearly twice the average of 1.64. Do the numbers indicate catastrophic failure of the prevention and management of our aviation resources, or is there another comparison that puts this into perspective?

One source of comparison can be found in the AOPA Air Safety Foundation’s “2006 Nall Report”. This is the nation’s foremost annual review of general aviation (GA) accident statistics. GA comprises the majority of civil aviation activity in the United States and the statistics are based upon National Transportation Safety Board (NTSB) investigations of accidents which are intended to help the media, the public and the aviation community better understand the factors involved in aviation mishaps.

The most current data shows that the GA accident rate continues to decline over time while the number of flight hours continues to escalate. The 10 year accident rate stands at 7.2 while fatal accidents occur at a rate of 1.4 per 100K hours.

Another source of comparison is the Federal Aviation Safety Report recently released by the General Services administration (GSA). Fourteen Executive

branch agencies report aviation accident data to GSA's Aviation Mishap Information System. In 2006 the numbers look like this; total hours reported 419,569; total accidents reported 17; accident rate for 2006 is 4.05 and fatal accident rate 1.9.

Comparison between US Aviation Communities (5 year average rates):

| | |
|---------------------------------------|------|
| US Air Carrier – Scheduled Airlines | 0.61 |
| US Commuter – Scheduled Airlines | 1.57 |
| US Air taxi – On – Demand | 2.25 |
| US Federal Executive Agencies (Ave) | 4.05 |
| US Dept. Agriculture – Forest Service | 5.56 |
| US General Aviation | 6.22 |
| US Army (all classes aviation) | 9.95 |

The attractive part of System Safety is that it allows us to measure our successes along with failures. I know of no Fortune 500 company that would base their business plan solely on their failure rate (which is what accident rates are). By evaluating risk management and prevention actions we have added a proactive system to measure the performance of our aviation program. In 2007 we are identifying metrics that evaluate the numbers of hazards that are mitigated, avoided or eliminated. These accomplishments have the potential to reflect positive results in lieu of failures.

The System Safety project is evolving in concert with changing doctrine in the Forest Service. This well orchestrated program is conducted on an agency-wide basis and has the highest expectations of its leaders. The expectation is nothing less than cultural changes from top to bottom with an end result that changes behaviors to achieve positive outcomes. By changing risk taking behavior, improving leadership and encouraging better decision-making the agency intends to achieve greater efficiency and improve the working environment. In short, I feel the System Safety process will greatly help us toward achieving the elusive zero accident rate, which translates to saving more firefighter/aviator's lives.

R.G. "Ron" Hanks
National Aviation Safety and Training Manager

Aviation Safety Accomplishments

Accomplishments achieved in aviation safety in FY 2006 include the following:

Safety Initiatives:

- Began and coordinated Interagency Aviation Safety Alerts (5)
- FS Safety Alerts (2)
- FS Technical Alerts (2)
- Airwards (2 issues)
- Coordinated investigation teams on 4 accidents and 4 incidents with potential
- Promoted and System Safety program with DOI agencies.
- Initiated Aviation Program Risk Assessments for helicopter and aerial supervision programs.
- Completed Large Airtanker Risk Assessment and issued recommendations to mitigate trends in Controlled Flight Into Terrain (CFIT)
- Completed Aviation Operations Risk Assessment with the Rocky Mountain Research Station and recommended mitigations and training
- Monitored SEAT program and mitigated several identified risks

Policy/Procedure Recommendations

- Assisted in development of Doctrine
- Provided ARB Action Items to get incorporated in to Inspector Pilot Guides
- Participated in developing SEAT performance data
- Assisted with contract modifications to include ARB action items

Training Programs:

- Coordinated Aircraft Health Management certificate program through UC Davis
- Funded and coordinated scholarship program (System Safety Leadership for Aviation Management) SSLAM for the UC Davis Aviation Certificate Program.
- Coordinated/funded project with DOI for Interagency Aviation Training program
 - On-line computer based training/ contracted course development
 - ACE classroom training held at 4 locations
- Coordinated/Funded project with BLM for helicopter pilot training
- Contracted for professional curriculum development
- Coordinated USFS ACE instructor assignments, preparation

| Forest Service FY 2006 Program Risk Assessments | | |
|--|----------------------------------|--------------------|
| Program | # of High Outcome Hazards | Action Plan |
| Airtanker | 24 | Yes |
| Helicopter | 38 | N/A |
| Aerial Supervision | Draft | N/A |
| SEAT | 52 | Yes |
| Back-Country | Draft | N/A |
| Rappel | Draft | N/A |
| RMRS | 7 | Yes |

Statistical Summary

The USFS flew 89,648 hours in FY 2006, which is 10,601 hours more than the 10-year average of 79,047. The accident rate for FY 2006 is 4.46, which is below the 10-year average of 5.56. We experienced 4 accidents and 6 “Incidents with Potential” (IWP). Unfortunately, we did not make it through the year without any fatalities. There were six fatalities, two in a CH-54 accident and four in an AS-350 accident. The number of fatalities is well above the 10-year average of 2.8, the last time we had this many fatalities was in 1994.

The Forest Service utilizes aircraft mainly for fire suppression. The **primary** mission of USDA Forest Service Aviation is to support the ground firefighter through a variety of means, including, but not limited to:

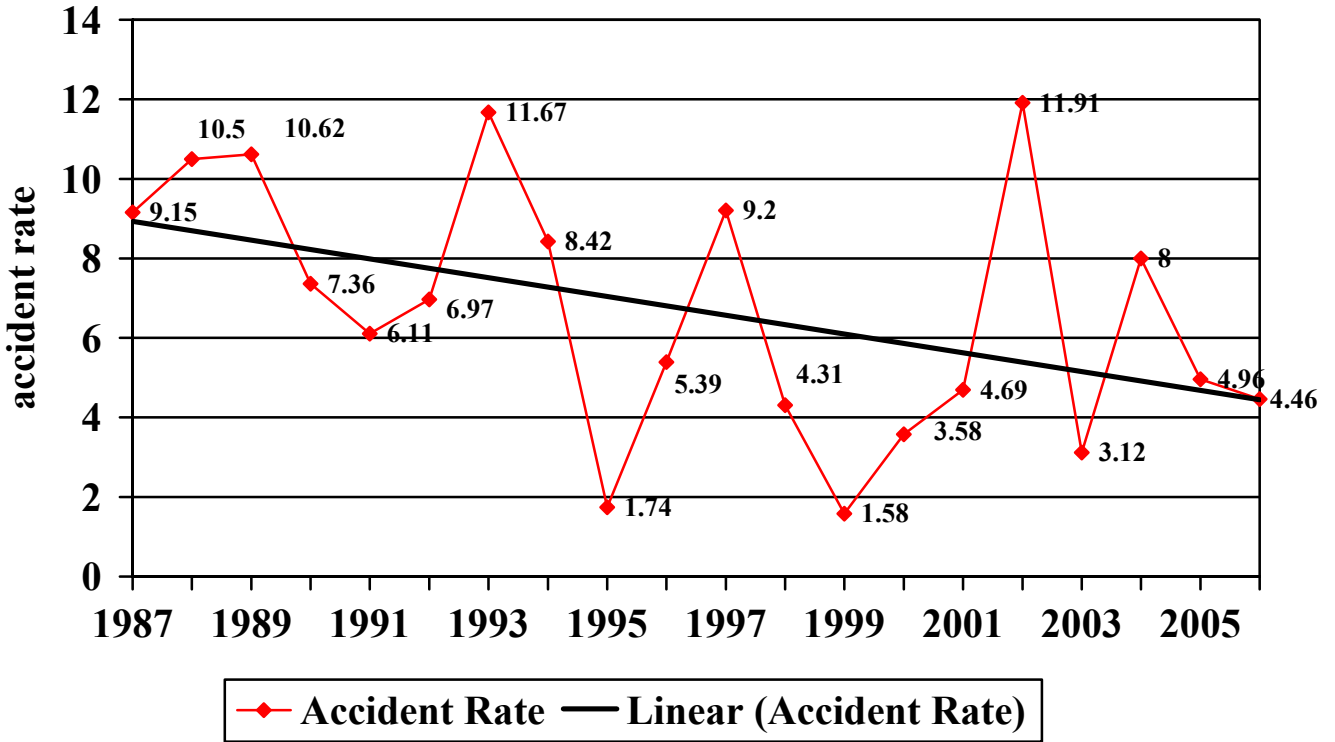
- ✓ Aerial delivery of firefighters by parachute, rappel line, or on site landing
- ✓ Air tactical command and control
- ✓ Firefighter transport
- ✓ Surveillance, reconnaissance, and intelligence gathering
- ✓ Infrared mapping
- ✓ Aerial delivery of fire retardant and water

Aircraft are also used for a wide variety of other missions, including administration, research, forest rehabilitation, forest health, law enforcement, aerial photography, and infrared surveillance.

Approximately 160 employees at the Washington Office and Regional levels administer the Forest Service aviation program. The national staff is located in Washington D.C. and at the National Aviation Safety Center in Boise, Idaho. The vast majority of aviation personnel are located at nine regional operations centers around the United States, providing day-to-day operational oversight and program guidance.

The Forest Service annually operates approximately 800 aircraft. These include government owned, cooperators, chartered, leased, and contractor operated aircraft. The Forest Service owns approximately 250 aircraft and operates 25 aircraft (22 fixed-wing and 3 helicopters.) Over 200 Forest Service owned aircraft are operated by numerous states under the Federal Excess Personal Property (FEPP) program, these aircraft are not included in these statistics or mishap data. Approximately 500 helicopters and fixed wing aircraft of various makes and models are chartered, leased or contracted annually. The aircraft are inspected and “carded” for government use by interagency inspectors, and are flown and maintained by the contractors.

USFS Aircraft Accident Rates 1987 to 2006



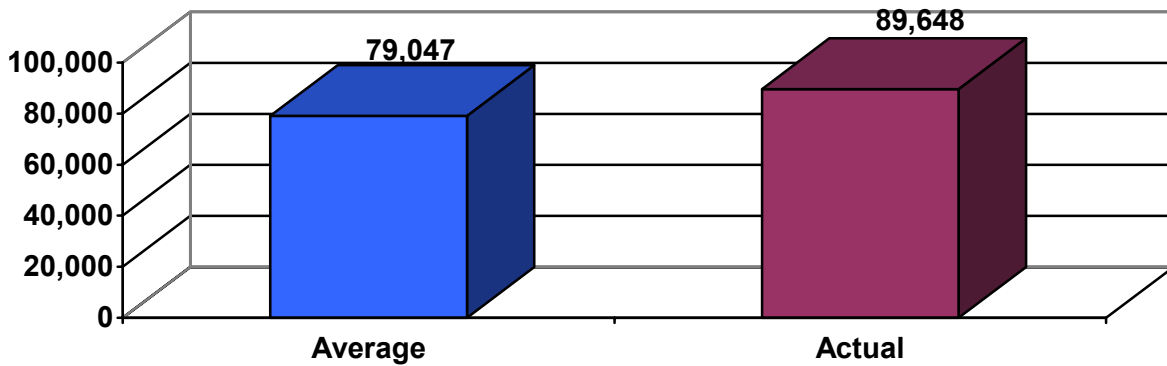
FY 2006 Accident Statistics

| Aircraft Type | Hours | Number of Accidents | Accident Rate | Number of Fatal Accidents | Fatal Accident Rate | Number of Fatalities | Fatality Rate |
|---------------|--------|---------------------|---------------|---------------------------|---------------------|----------------------|---------------|
| Fixed-Wing | 34,564 | 1 | 2.89 | 0 | 0 | 0 | 0 |
| Helicopter | 39,735 | 3 | 7.55 | 2 | 5.03 | 6 | 15.1 |
| Airtanker | 6,659 | 0 | 0 | 0 | 0 | 0 | 0 |
| * SEAT | 1,792 | 0 | 0 | 0 | 0 | 0 | 0 |
| USFS Owned | 6,898 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 89,648 | 4 | 4.46 | 2 | 2.23 | 6 | 6.69 |

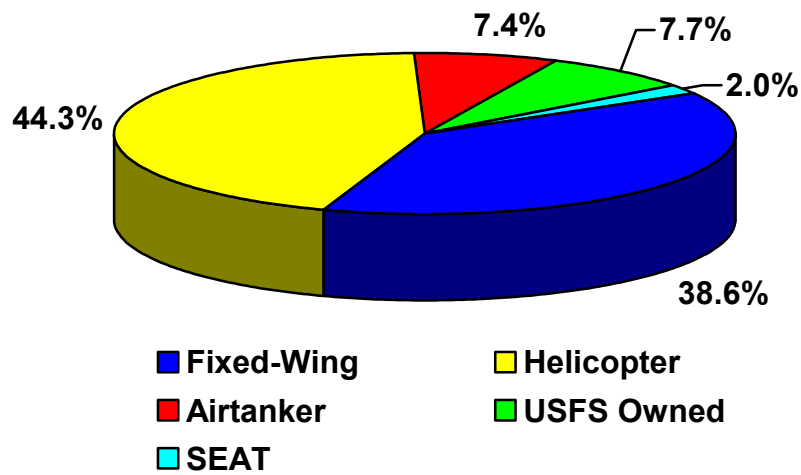
The actual hours flown in FY 2006 are above the ten-year average of 79,047. Analysis of the data shows an increase (+10,601) in total number of hours flown.

*SEAT – flight hours for SEAT aircraft on USFS lands were obtained from the DOI, Aviation Management Directorate

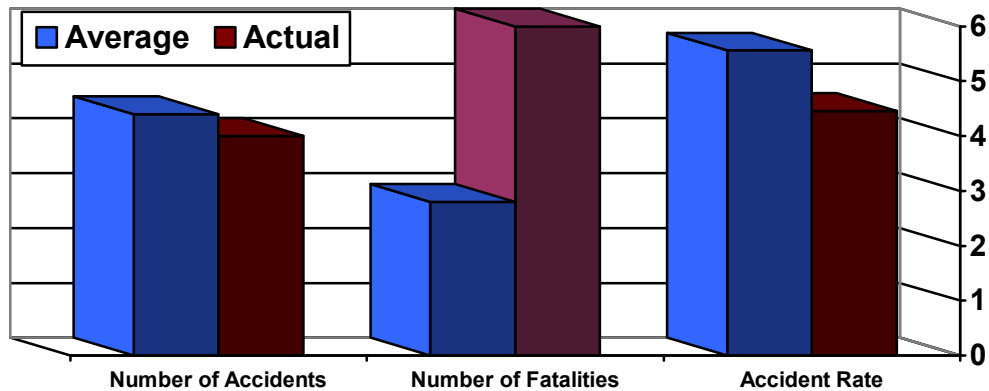
Average vs Actual Hours Flown for FY 2006



FY 2006 Flight Hour Percentages



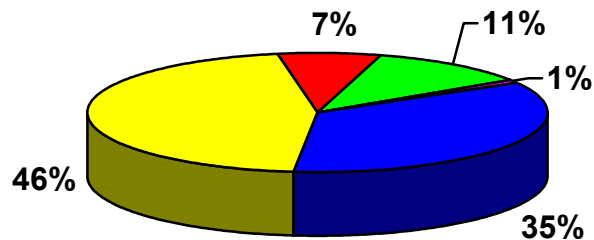
Average vs Actual for FY 2006



10-Year Accident Statistics

| Comparison of Averages FY 1997-2006 | | | |
|-------------------------------------|-----------------|--------|------------|
| | 10 Year Average | Actual | Comparison |
| Hours flown | 79,047 | 89,648 | +10,601 |
| Number of Accidents | 4.4 | 4 | -.4 |
| Number of Fatalities | 2.8 | 6 | +4.8 |
| Accident Rate | 5.56 | 4.46 | -1.1 |

10 Year Average of Flight Hour Percentages 1997-2006



■ Fixed-Wing
 ■ Helicopter
 ■ Airtanker
 ■ USFS Owned
 ■ SEAT

10-Year Flight Hour Statistics

| Flight Hours: | | | | | | |
|-----------------------|------------|------------|-----------|-------|------------|---------|
| Fiscal Year | Fixed Wing | Helicopter | Airtanker | SEAT | USFS Owned | Total |
| 2006 | 34,564 | 39,735 | 6,659 | 1,792 | 6,898 | 89,648 |
| 2005 | 22,521 | 28,362 | 3,682 | 674 | 5,185 | 60,424 |
| 2004 | 22,713 | 29,885 | 1,535 | 1,006 | 7,333 | 62,472 |
| 2003 | 32,704 | 50,662 | 5,082 | 765 | 7,607 | 96,055 |
| 2002 | 33,011 | 54,427 | 8,573 | 451 | 13,052 | 109,063 |
| 2001 | 26,580 | 39,497 | 7,832 | 282 | 11,241 | 85,150 |
| 2000 | 34,976 | 53,145 | 10,616 | 750 | 12,749 | 111,486 |
| 1999 | 21,873 | 25,174 | 6,069 | 284 | 10,019 | 63,135 |
| 1998 | 32,416 | 24,423 | 3,685 | 902 | 9,055 | 69,579 |
| 1997 | 16,753 | 16,295 | 2,801 | 40 | 7,608 | 43,457 |
| 10-year totals | 278,111 | 361,605 | 56,534 | 6,946 | 90,747 | 790,469 |
| Averages | 27,811 | 36,161 | 5,653 | 695 | 9,075 | 79,047 |

10-Year Accident Rates

| Year | Total Number of Accidents | Total Accident Rate | Fixed-Wing Accident Rate | Helicopter Accident Rate | Airtanker Accident Rate | USFS Owned Accident Rate |
|------------------------|---------------------------|---------------------|--------------------------|--------------------------|-------------------------|--------------------------|
| 2006 | 4 | 4.46 | 2.89 | 7.55 | 0.00 | 0.00 |
| 2005 | 3 | 4.96 | 4.44 | 7.05 | 0.00 | 0.00 |
| 2004 | 5 | 8.0 | 8.8 | 6.69 | 0.00 | 0.00 |
| 2003 | 3 | 3.12 | 3.05 | 3.94 | 0.00 | 0.00 |
| 2002 | 13 | 11.91 | 3.02 | 14.69 | 23.32 | 15.32 |
| 2001 | 4 | 4.69 | 3.76 | 5.06 | 0.00 | 0.00 |
| 2000 | 4 | 3.58 | 2.85 | 3.76 | 0.00 | 7.84 |
| 1999 | 1 | 1.58 | 0.00 | 3.97 | 0.00 | 0.00 |
| 1998 | 3 | 4.31 | 3.08 | 4.09 | 27.14 | 0.00 |
| 1997 | 4 | 9.20 | 0.00 | 24.55 | 0.00 | 0.00 |
| 10-year Average | 4.4 | 5.56 | 3.23 | 7.46 | 5.3 | 3.3 |

10-Year Fatal Accident and Fatality Rates

| Year | Fatal Accidents | Fatal Accident Rate | Number of Fatalities | Fatality Rate |
|------------------------|-----------------|---------------------|----------------------|---------------|
| 2006 | 2 | 2.23 | 6 | 6.69 |
| 2005 | 1 | 1.65 | 3 | 4.96 |
| 2004 | 2 | 3.2 | 4 | 6.4 |
| 2003 | 1 | 1.04 | 2 | 2.08 |
| 2002 | 3 | 2.75 | 5 | 4.58 |
| 2001 | 0 | 0.00 | 0 | 0.00 |
| 2000 | 1 | 0.89 | 2 | 1.79 |
| 1999 | 0 | 0.00 | 0 | 0.00 |
| 1998 | 2 | 2.87 | 4 | 5.75 |
| 1997 | 1 | 2.30 | 2 | 4.60 |
| 10-year Average | 1.3 | 1.64 | 2.8 | 3.54 |

Accident Rate = Number of accidents divided by the number of hours flown times 100,000.

Fatal Accident Rate = Number of fatal accidents divided by the number of hours flown times 100,000.

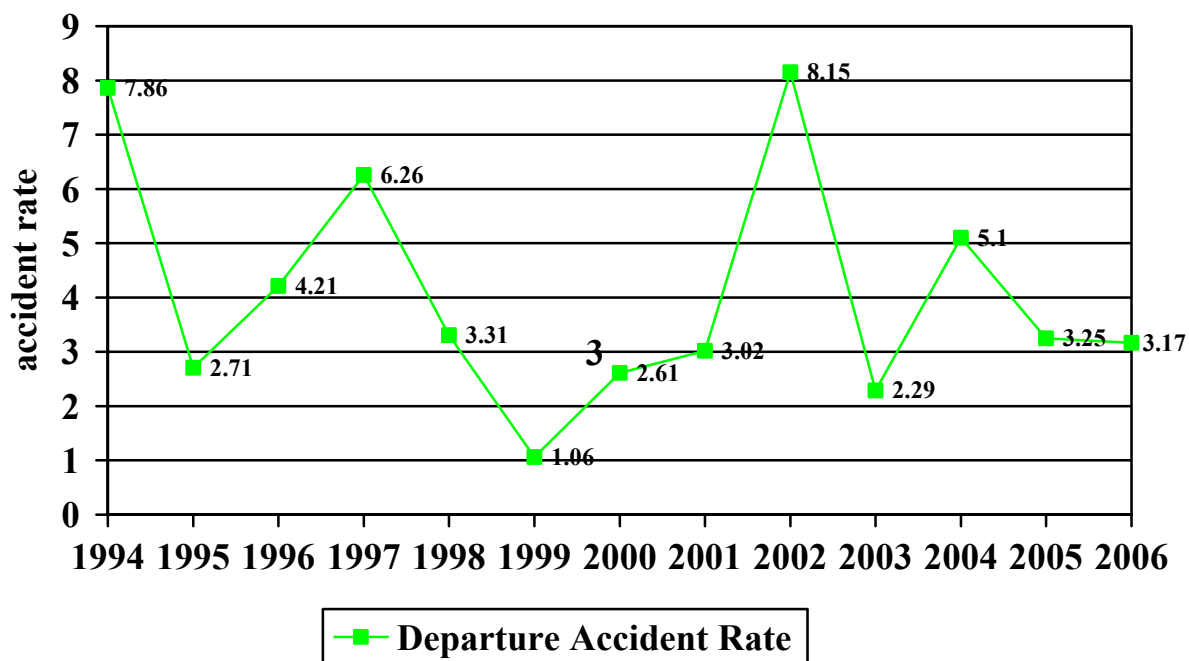
Fatality Rate = Number of fatalities divided by the number of hours flown times 100,000.

Departure Accident Rate = Number of accidents divided by the number of departures times 100,000

10-Year Departure Data

| Fiscal Year | Number of Departures | Number of Accidents | Departure Rate |
|-----------------------|----------------------|---------------------|----------------|
| 2006 | 125,913 | 4 | 3.17 |
| 2005 | 92,195 | 3 | 3.25 |
| 2004 | 97,899 | 5 | 5.1 |
| 2003 | 130,784 | 3 | 2.29 |
| 2002 | 159,453 | 13 | 8.15 |
| 2001 | 132,327 | 4 | 3.02 |
| 2000 | 152,784 | 4 | 2.61 |
| 1999 | 94,072 | 1 | 1.06 |
| 1998 | 90,491 | 3 | 3.31 |
| 1997 | 63,856 | 4 | 6.26 |
| 10-year totals | 1,139,774 | 44 | |
| Averages | 113,977 | 4.4 | 3.86 |

Departure Accident Rate is the number of accidents divided by the number of departures times 100,000.

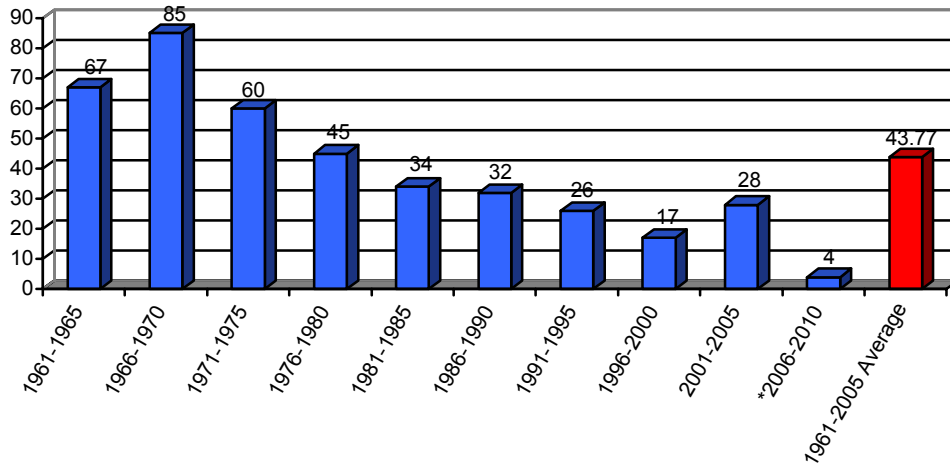


Forest Service Aircraft Accident Statistics in 5-Year Increments

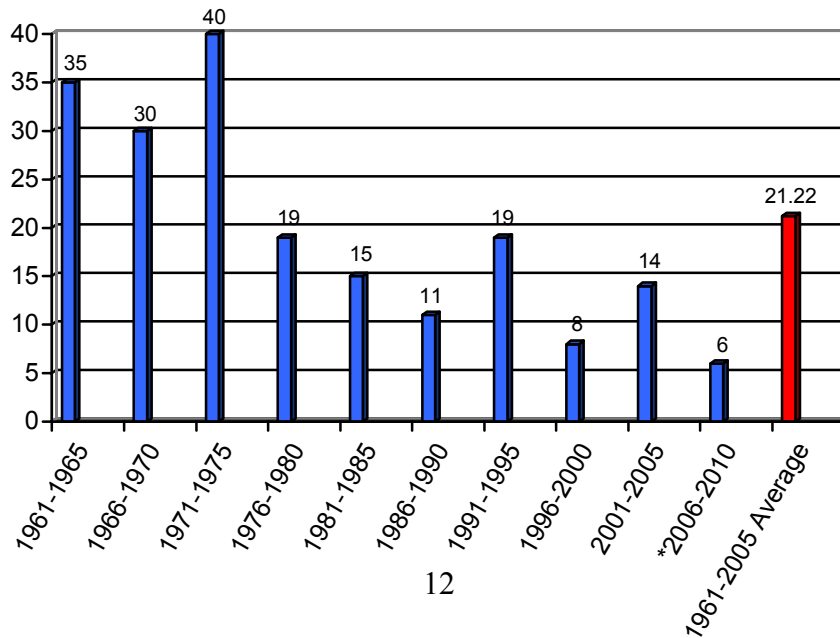
Observations

The total number of accidents in 5-year increments shows a steady decline, until the 2001-2005 period. The total number of fatalities in 5-year increments shows a major decline in the 80's from the 70's; however, a couple of spikes in the early nineties and the 2001-2005 year period.

**Total Number of Accidents for all aircraft
(5-Year Increments)**



**Total Number of Fatalities for all aircraft
(5-Year Increments)**



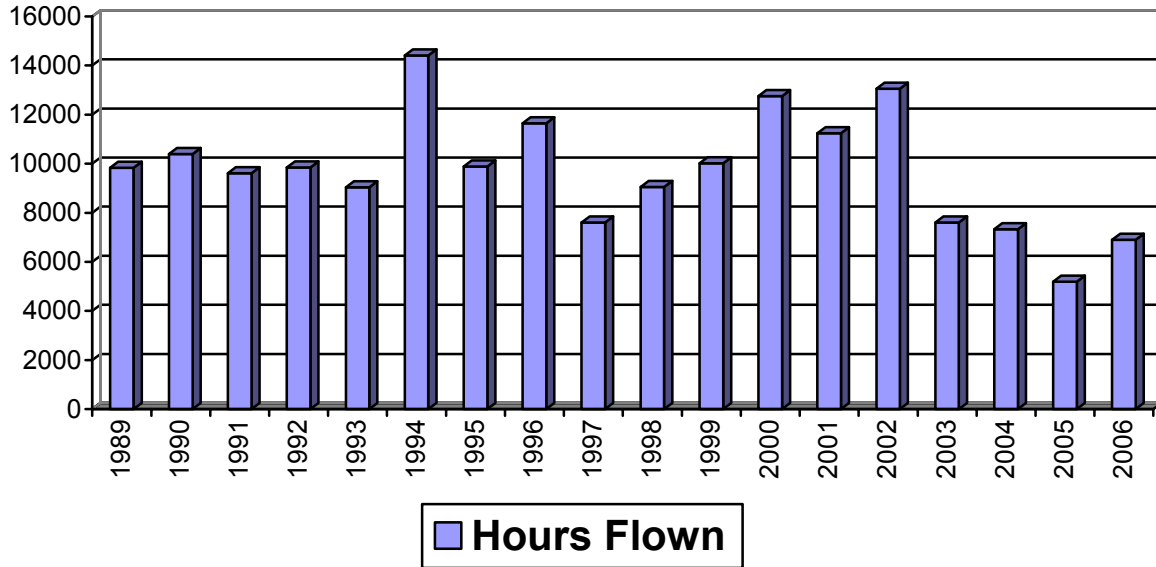
USFS Owned & Operated Aircraft

Forest Service owned aircraft accounted for only 7.7 percent of the total hours flown in FY 2006; the 10-year average is 11 percent. There have not been any accidents since FY 2002 when we experienced two accidents. There have not been any fatal accidents for eleven years. One Forest Service aircraft was involved in an IWP while working for the Department of Interior.

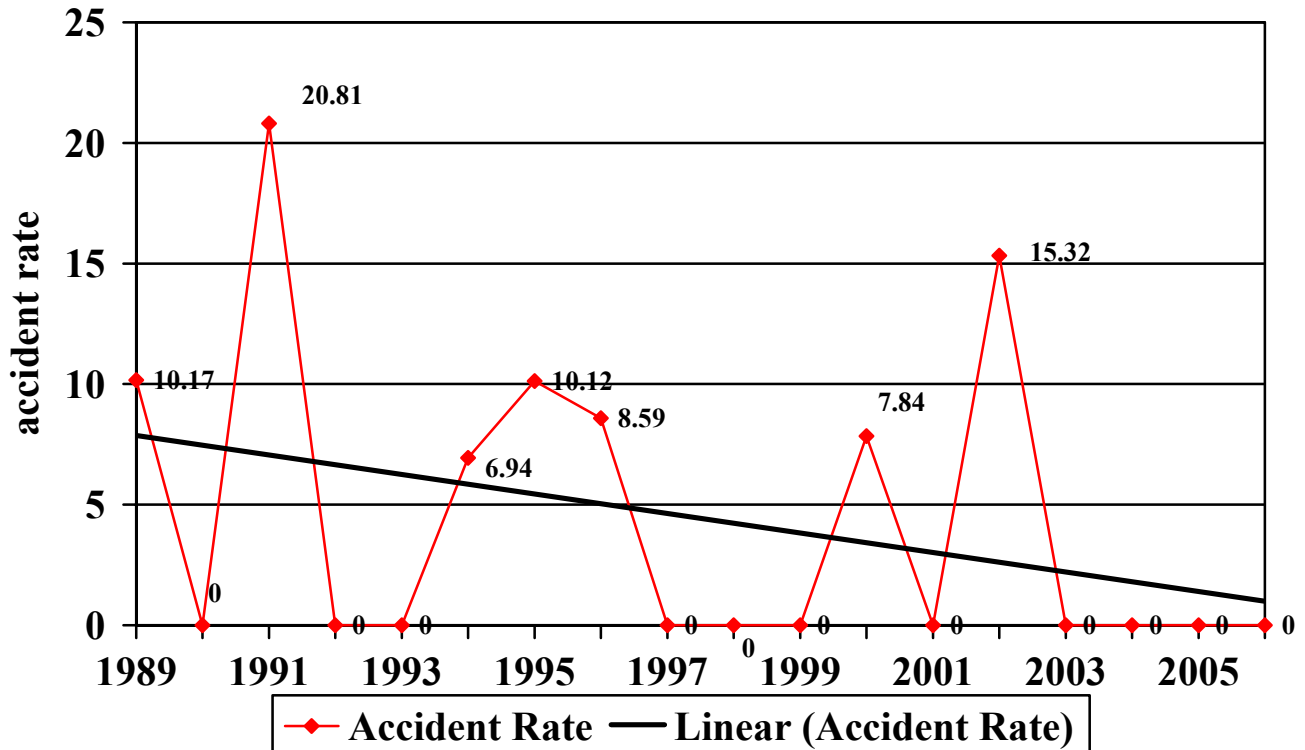


| USFS Owned 10-Year Statistics | | | | | | | |
|-------------------------------|-------------|-----------|---------------|-----------------|---------------------|------------|---------------|
| Fiscal Year | Hours Flown | Accidents | Accident Rate | Fatal Accidents | Fatal Accident Rate | Fatalities | Fatality Rate |
| 2006 | 6,898 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2005 | 5,185 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2004 | 7,333 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2003 | 7,607 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2002 | 13,052 | 2 | 15.32 | 0 | 0.00 | 0 | 0.00 |
| 2001 | 11,241 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2000 | 12,749 | 1 | 7.84 | 0 | 0.00 | 0 | 0.00 |
| 1999 | 10,019 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1998 | 9,055 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1997 | 7,608 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Total | 90,747 | 3 | | 0 | | 0 | |
| Average | 9,075 | 0.3 | 3.3 | 0 | 0.00 | 0 | 0.00 |

USFS Owned Hours Flown



USFS Owned Aircraft Accident Rates 1989 to 2006



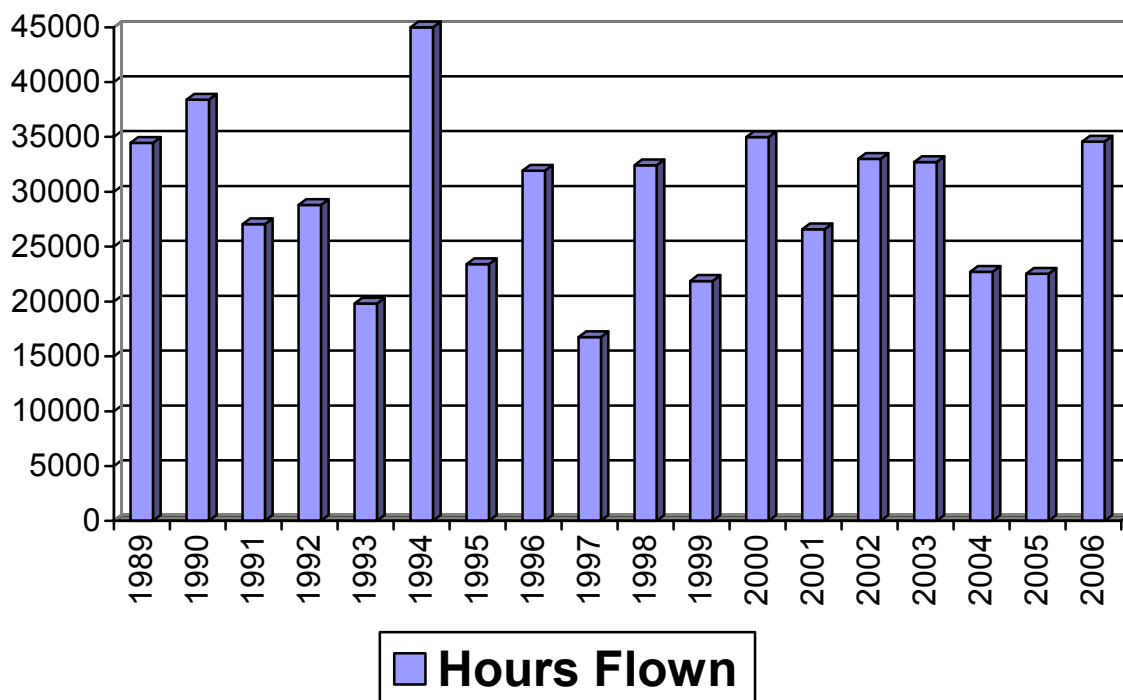
Fixed-Wing (Contract)

Fixed-Wing aircraft accounted for 38.6 percent of the total hours flown in FY 2006, the 10-year average is 35 percent. There were 34,564 hours flown in FY 2006, which is well above the 10-year average of 27,811.

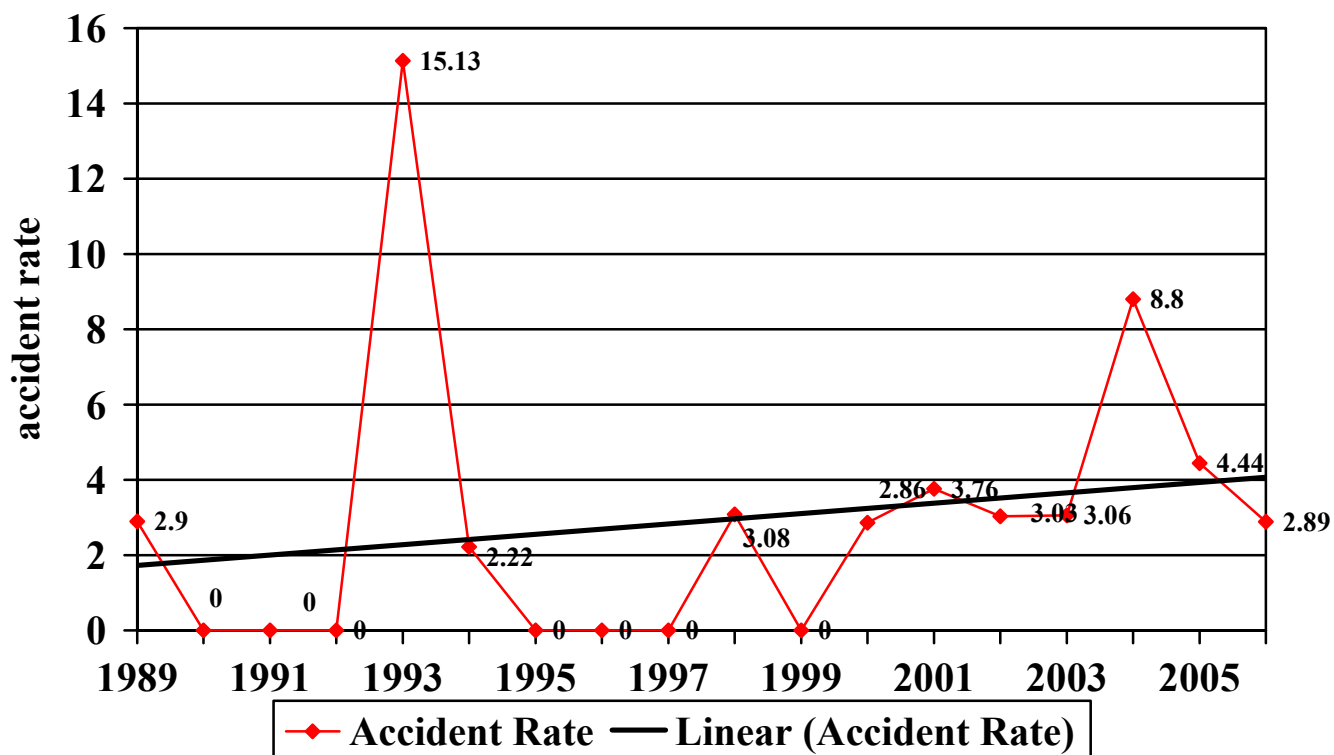


| Fixed-Wing 10-Year Statistics | | | | | | | |
|-------------------------------|-------------|-----------|---------------|-----------------|---------------------|------------|---------------|
| Fiscal Year | Hours Flown | Accidents | Accident Rate | Fatal Accidents | Fatal Accident Rate | Fatalities | Fatality Rate |
| 2006 | 34,564 | 1 | 2.89 | 0 | 0.00 | 0 | 0.00 |
| 2005 | 22,521 | 1 | 4.44 | 0 | 0.00 | 0 | 0.00 |
| 2004 | 22,713 | 2 | 8.80 | 1 | 4.40 | 3 | 13.2 |
| 2003 | 32,704 | 1 | 3.06 | 0 | 0.00 | 0 | 0.00 |
| 2002 | 33,011 | 1 | 3.03 | 0 | 0.00 | 0 | 0.00 |
| 2001 | 26,580 | 1 | 3.76 | 0 | 0.00 | 0 | 0.00 |
| 2000 | 34,976 | 1 | 2.86 | 1 | 2.86 | 2 | 5.72 |
| 1999 | 21,873 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1998 | 32,416 | 1 | 3.08 | 0 | 0.00 | 0 | 0.00 |
| 1997 | 16,753 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Total | 278,111 | 9 | | 2 | | 5 | |
| Average | 27,811 | 0.9 | 3.23 | 0.2 | 0.71 | 0.5 | 1.79 |

Fixed-Wing Hours Flown



Fixed-Wing (Contract) Aircraft Accident Rates 1989-2006



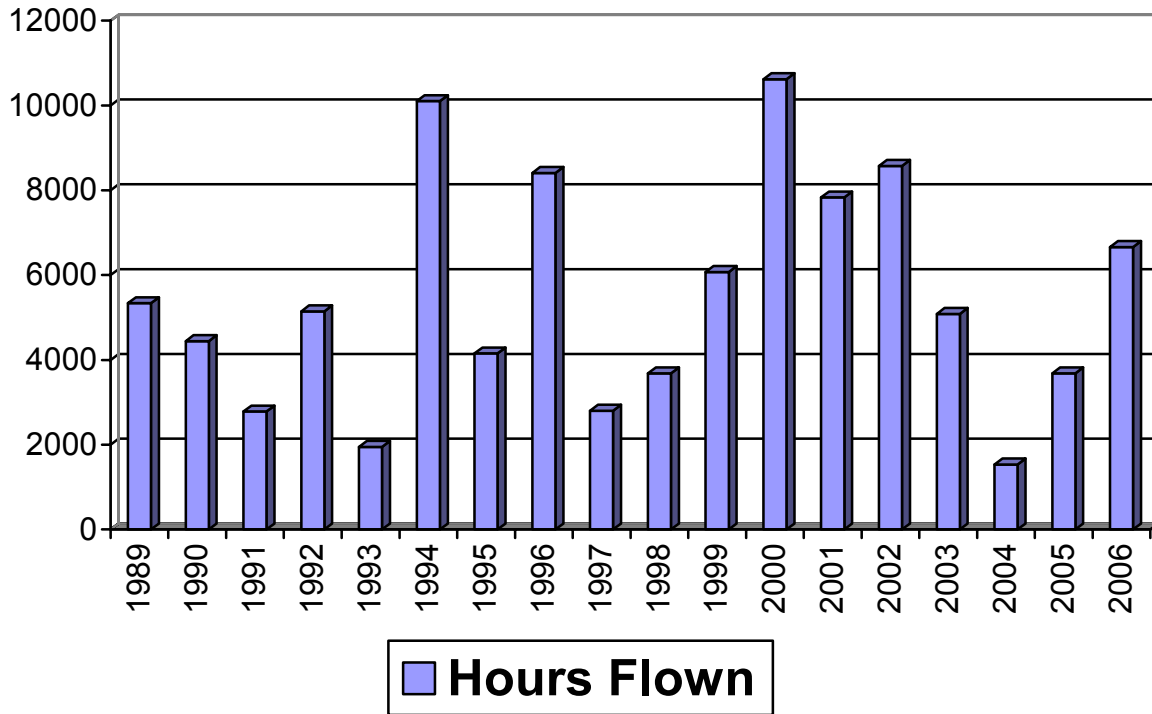
Airtankers

Airtankers accounted for 7.4 percent of the total hours flown in FY 2006; which is slightly above the 10-year average of 7%. There have not been any airtanker accidents for the past four years.

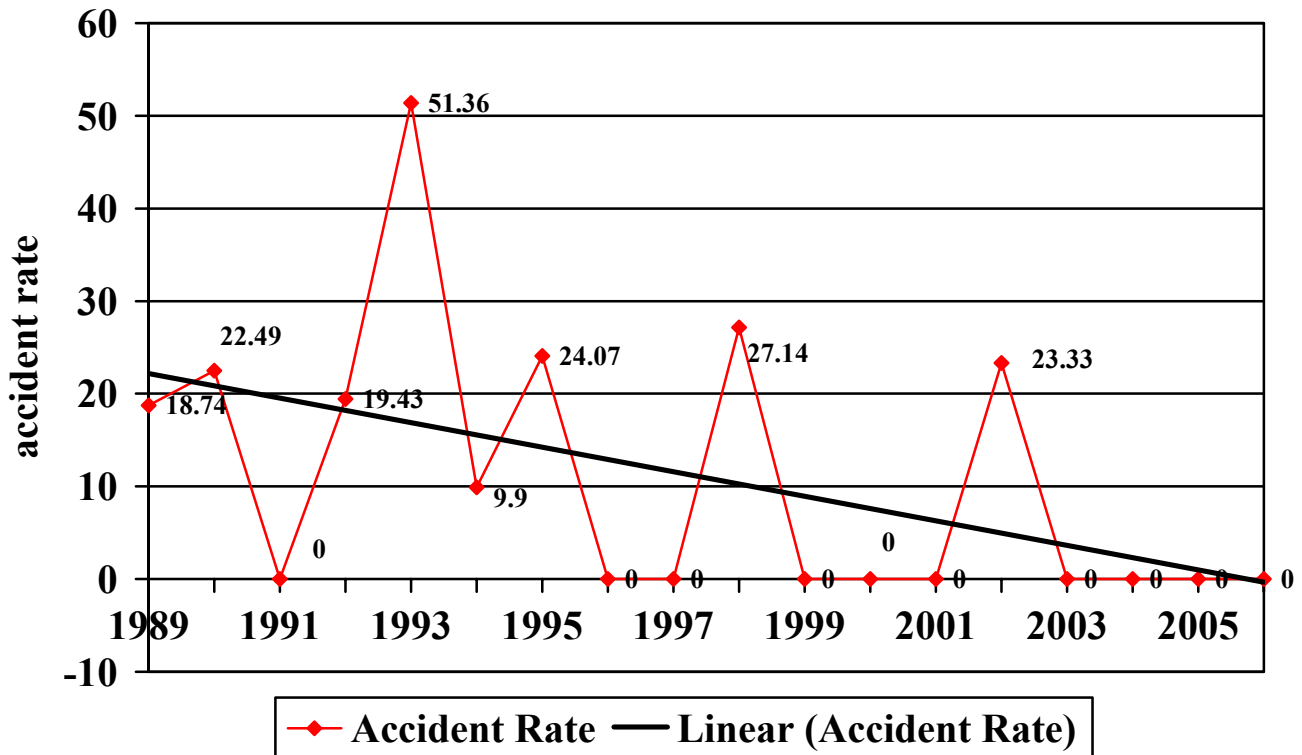


| Airtanker 10-Year Statistics | | | | | | | |
|-------------------------------------|--------------------|------------------|----------------------|------------------------|----------------------------|-------------------|----------------------|
| Fiscal Year | Hours Flown | Accidents | Accident Rate | Fatal Accidents | Fatal Accident Rate | Fatalities | Fatality Rate |
| 2006 | 6,659 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2005 | 3,682 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2004 | 1,535 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2003 | 5,082 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2002 | 8,573 | 2 | 23.33 | 2 | 23.33 | 5 | 58.32 |
| 2001 | 7,832 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2000 | 10,616 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1999 | 6,069 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 1998 | 3,685 | 1 | 27.14 | 1 | 27.14 | 2 | 54.27 |
| 1997 | 2,801 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Total | 56,534 | 3 | | 3 | | 7 | |
| Average | 5,653 | 0.30 | 5.3 | 0.30 | 5.3 | 0.70 | 12.38 |

Airtankers Hours Flown



Airtanker Accident Rates 1989 to 2006



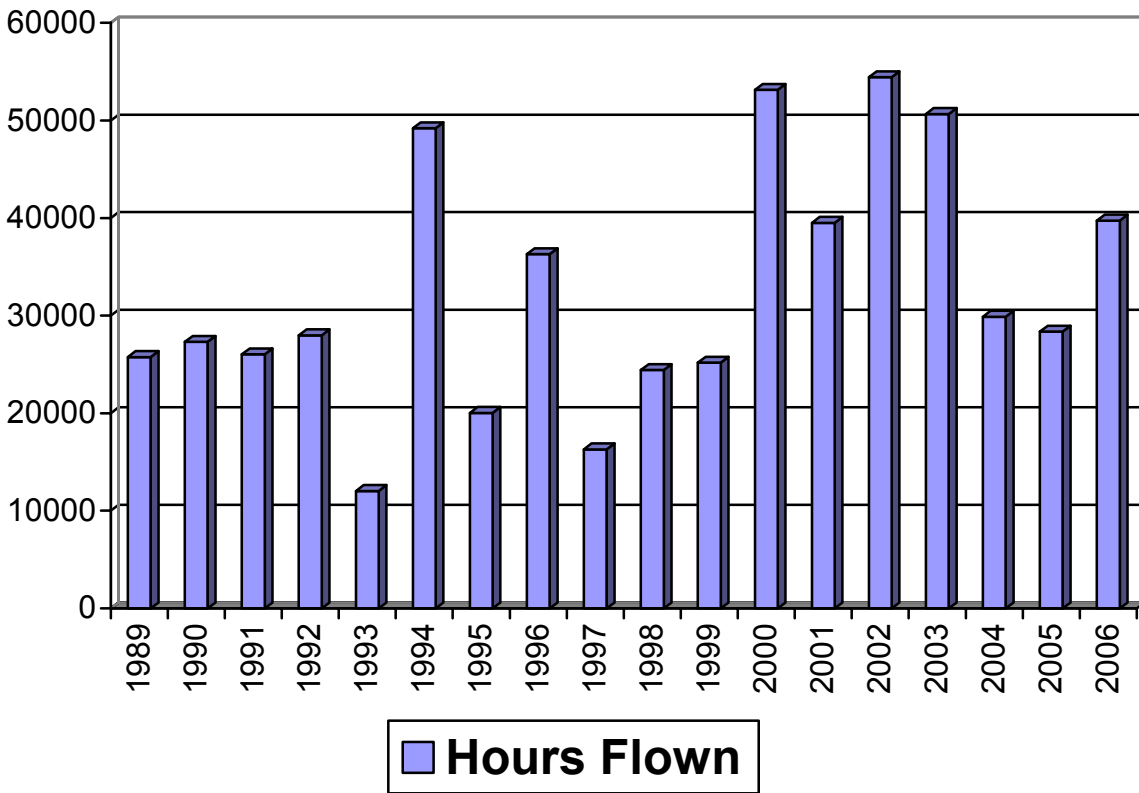
Helicopters

Helicopters accounted for 44.3 percent of the flight hours in FY 2006, which is slightly below the 10-year average of 46 percent. We experienced three helicopter accidents, two that were fatal. This was the most tragic year in over a decade with the loss of three employees and three contract pilots.

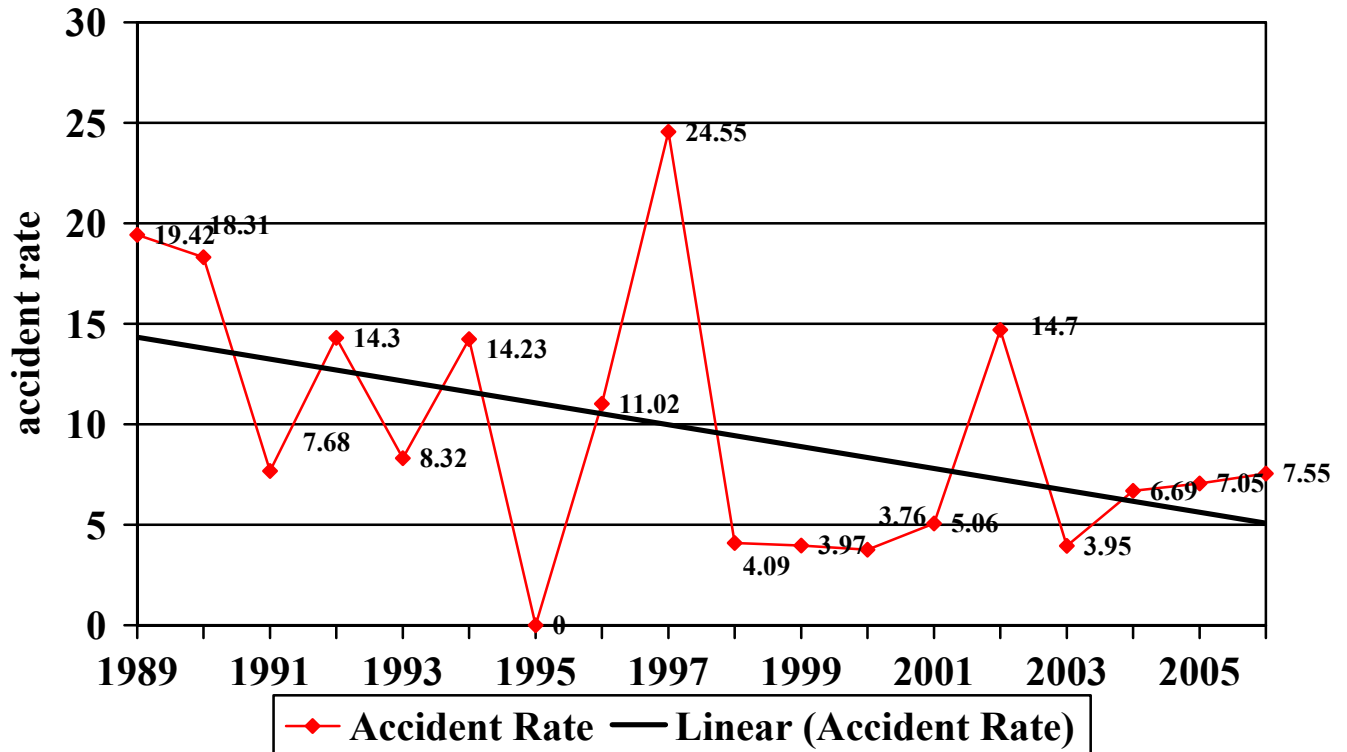


| Helicopter 10-Year Statistics | | | | | | | |
|-------------------------------|----------------|------------|---------------|-----------------|----------------------|------------|---------------|
| Fiscal Year | Hours Flown | Accidents | Accident Rate | Fatal Accidents | Fatal Accident Rates | Fatalities | Fatality Rate |
| 2006 | 39,735 | 3 | 7.55 | 2 | 5.03 | 6 | 15.01 |
| 2005 | 28,362 | 2 | 7.05 | 1 | 3.52 | 3 | 10.57 |
| 2004 | 29,885 | 2 | 6.69 | 1 | 3.34 | 1 | 3.34 |
| 2003 | 50,662 | 2 | 3.95 | 1 | 1.97 | 2 | 3.95 |
| 2002 | 54,427 | 8 | 14.70 | 1 | 1.84 | 1 | 1.84 |
| 2001 | 39,497 | 2 | 5.06 | 0 | 0.00 | 0 | 0.00 |
| 2000 | 53,145 | 2 | 3.76 | 0 | 0.00 | 0 | 0.00 |
| 1999 | 25,174 | 1 | 3.97 | 0 | 0.00 | 0 | 0.00 |
| 1998 | 24,423 | 1 | 4.09 | 1 | 4.09 | 2 | 8.19 |
| 1997 | 16,295 | 4 | 24.55 | 1 | 6.14 | 2 | 12.27 |
| Total | 361,605 | 27 | | 8 | | 17 | |
| Average | 36,161 | 2.7 | 7.46 | 0.8 | 2.21 | 1.7 | 4.7 |

Helicopters Hours Flown



Helicopter Accident Rates 1989 to 2006



SAFECOM Summary

The SAFECOM system satisfies Federal Aviation Regulations requirements for incident reporting, but more importantly, it provides management and front line supervisors with near real time trend information. Armed with data on emerging safety and effectiveness challenges, operators and management can take appropriate actions before a mishap occurs.

There were a total of 1,293 SAFECOM's submitted to the Interagency SAFECOM internet database of which included about 29 duplicates, leaving a total of 1,264. These include Forest Service, all DOI bureaus, States, Military and other. There were 754 Forest Service, 364 DOI, 133 State and 7 Military/Other/Unknown SAFECOM's.

The following charts trend the Forest Service SAFECOM data submitted to the Interagency SAFECOM Internet database at <http://www.safecom.gov/>. The average number of Forest Service SAFECOM's submitted is 687 per year. In FY 2006 the number of Forest Service SAFECOM's submitted, 754 was above the 10 year average of 687

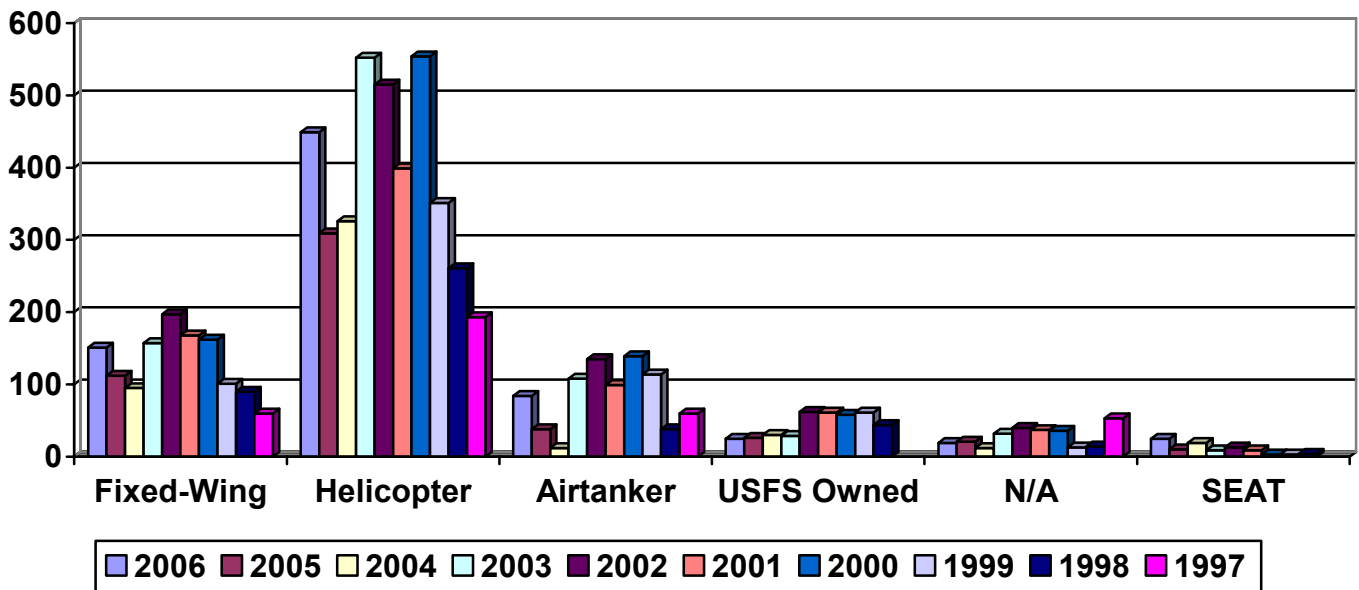
The most reported SAFECOM's were engine, electrical, chip light, communications, policy deviation, precautionary landing and dropped load. In an analysis of the past five years these continue to be the most reported, with the exception of the number of precautionary landings reported this year

| Yearly Forest Service SAFECOM Totals | |
|---|----------------------------|
| YEAR | Number of SAFECOM's |
| 2006 | 754 |
| 2005 | 516 |
| 2004 | 494 |
| 2003 | 887 |
| 2002 | 962 |
| 2001 | 773 |
| 2000 | 949 |
| 1999 | 640 |
| 1998 | 546 |
| 1997 | 366 |
| Total | 6,887 |
| 10 YR Average | 687 |

FY 2006 SAFECOM's by Aircraft Type

| Aircraft Type | Number |
|---------------|------------|
| Fixed Wing | 151 |
| Helicopter | 449 |
| Airtanker | 84 |
| N/A | 19 |
| SEAT | 25 |
| USFS Owned | 25 |
| Total | 753 |

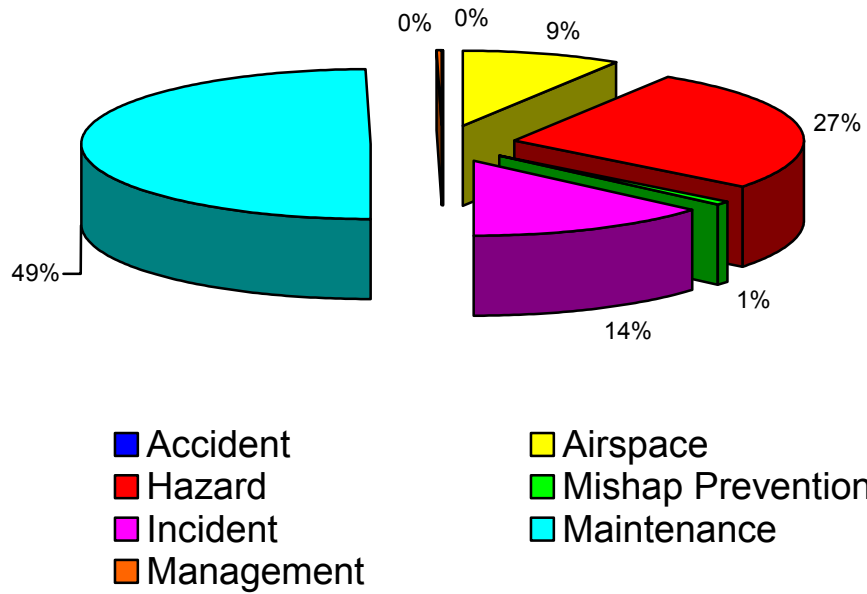
SAFECOM's by Aircraft Type for 10 Years



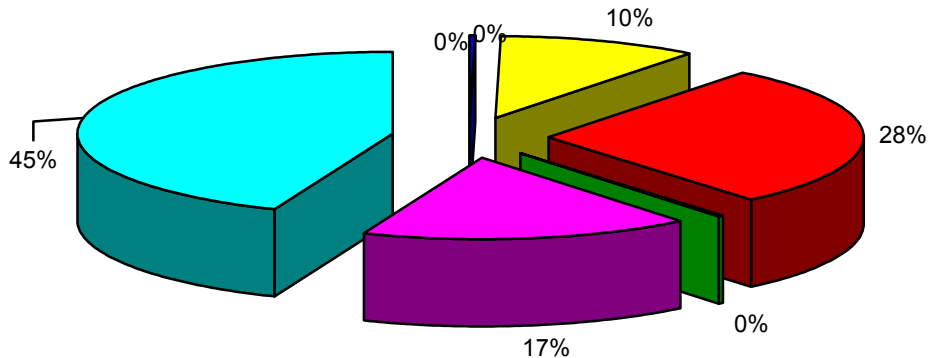
Forest Service SAFECOM's by Category

The numbers of SAFECOM's by category will be more than the total number of SAFECOM's reported as each SAFECOM can have more than one category assigned to it.

2006 Percent of SafeCom's by Category

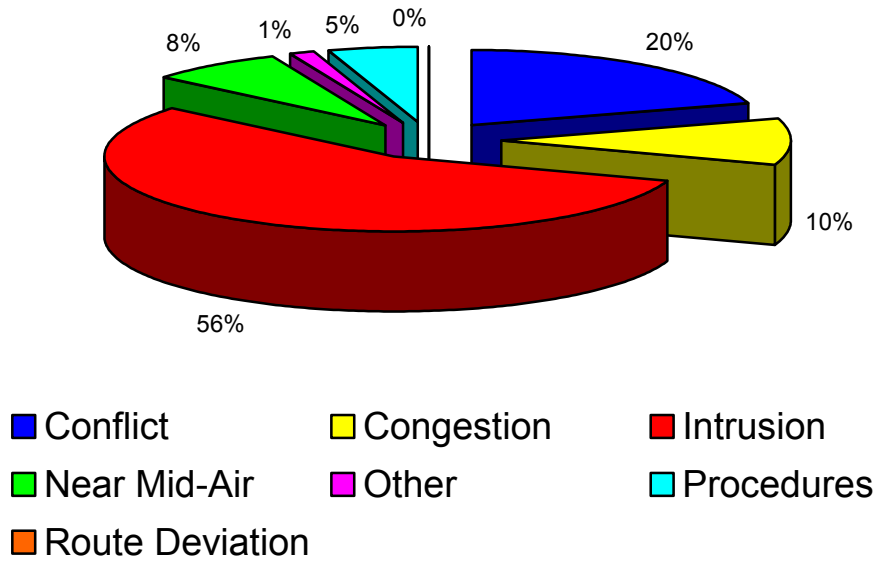


9-Year Average Percent of SafeCom's by Category

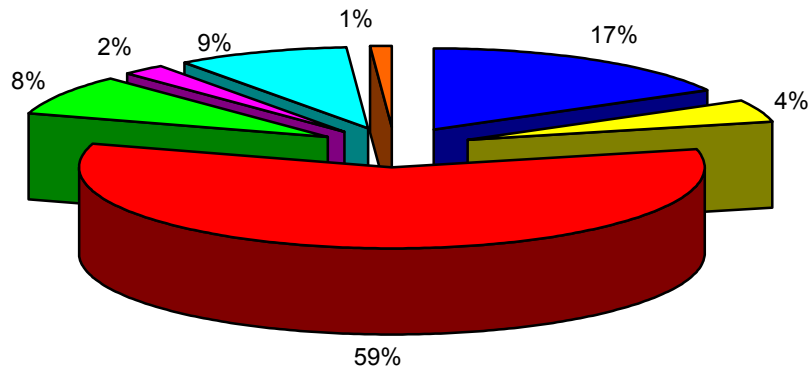


Forest Service Airspace SAFECOM's by sub-category

2006 Percent of Airspace SafeCom's

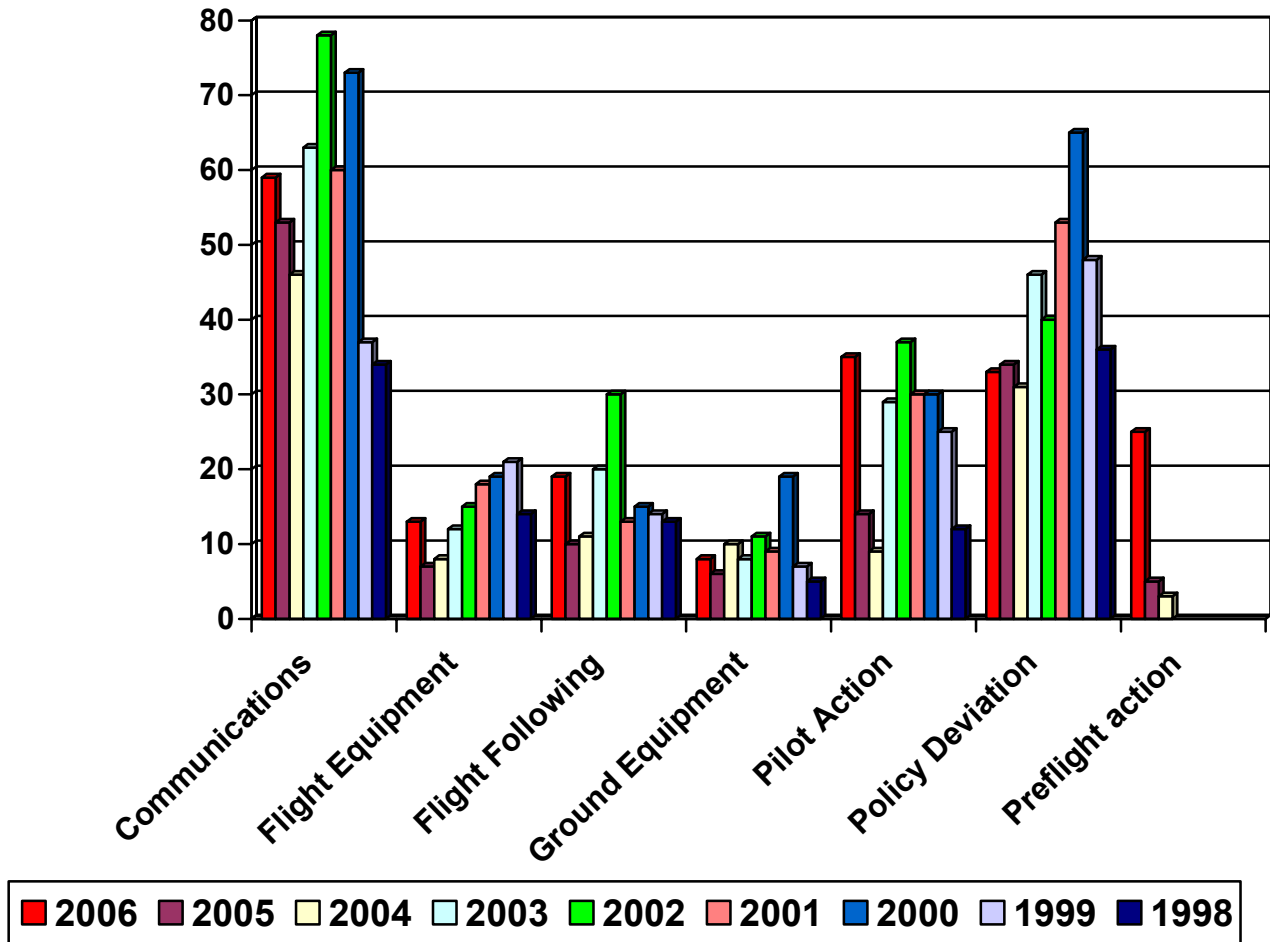


9 Year Average Percent of Airspace SafeCom's



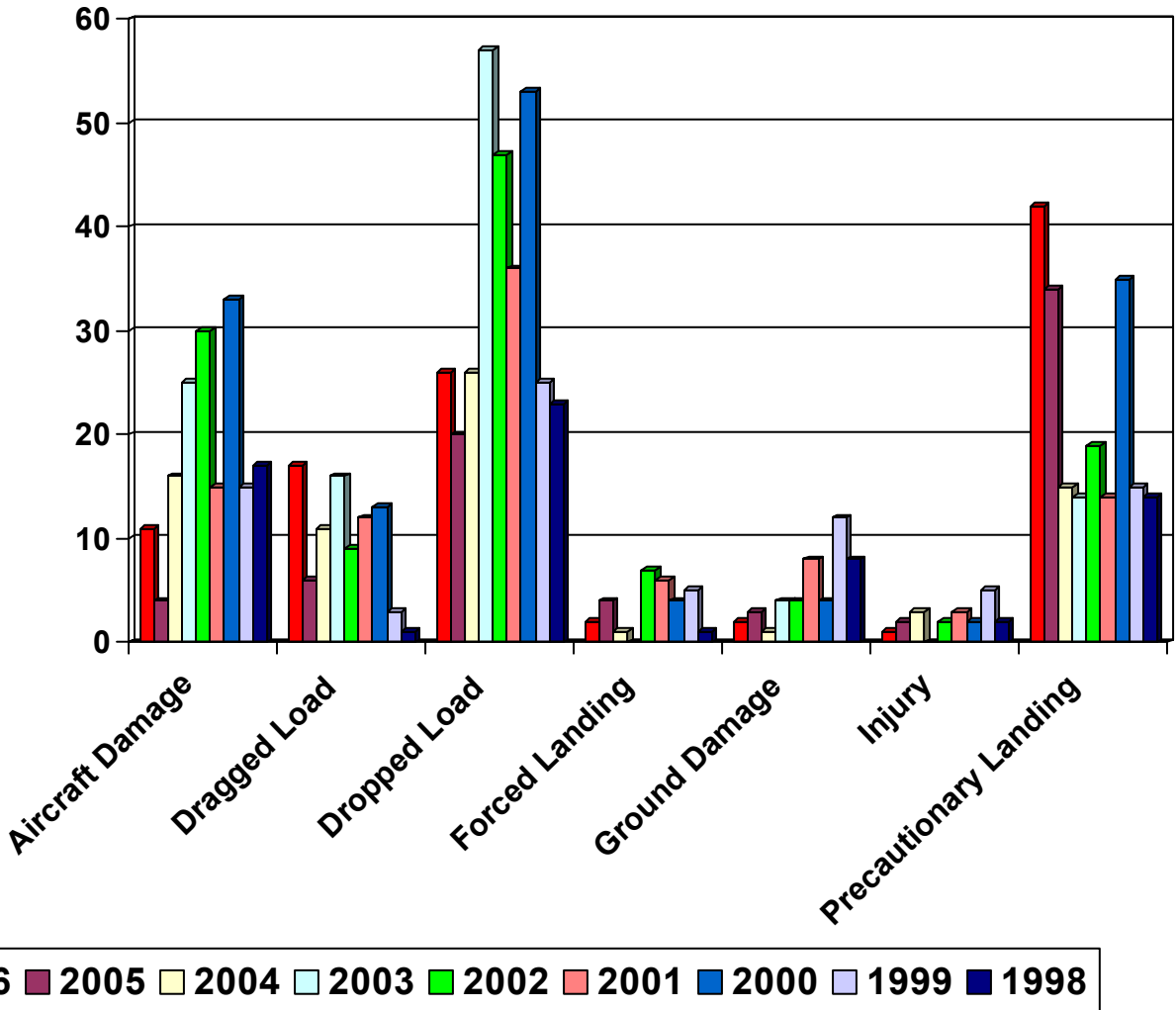
Forest Service Hazard SAFECOM's by sub-category

Below are the top 7 Hazards reported in the last 9 years. Communications were broke out into multiple categories in 2003 and the most reported were Ground Radios and Equipment, Frequency Management and Verbal. Preflight Action was a new category added in 2004.



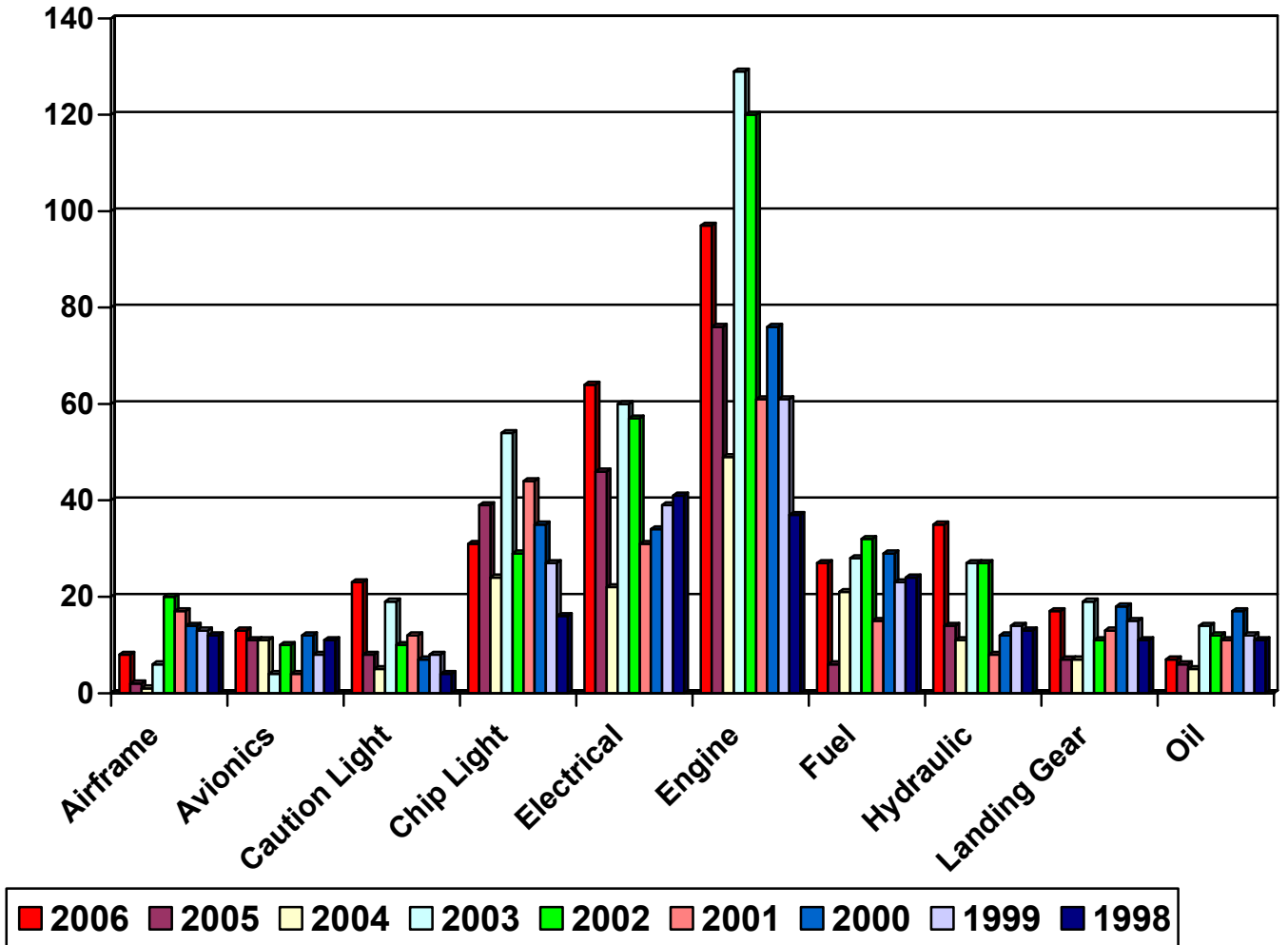
Forest Service Incident SAFECOM's by sub-category

Below are the top 7 Incident SAFECOM's reported in the last 9 years. Dropped Loads were the highest number of SAFECOM's reported in this category until the last two years.



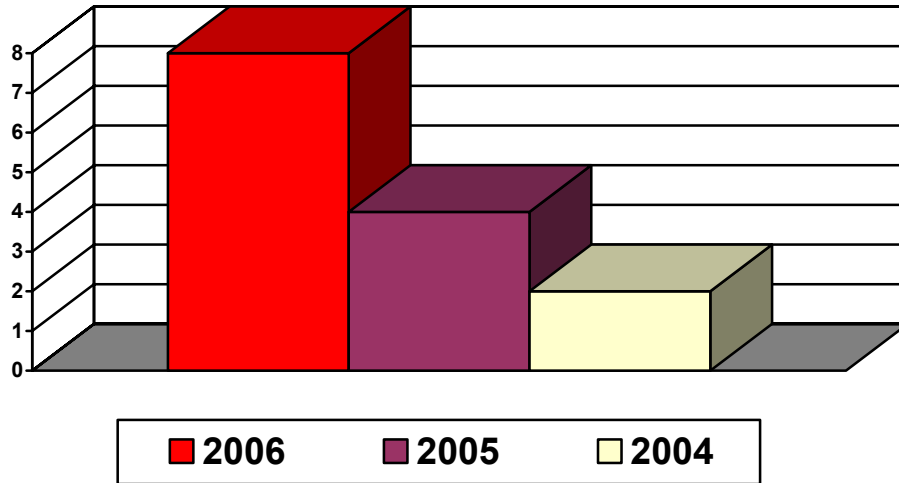
Forest Service FY 2006 Maintenance SAFECOM's by sub-category

Below are the top 10 Maintenance SAFECOM's reported in the last 9 years. Engine maintenance discrepancies were the most reported. In 2004 we added a sub-category under engine to capture more severe engine events (failures & shutdowns) which included 7 last year, 5 in 2005 and 1 in 2004.



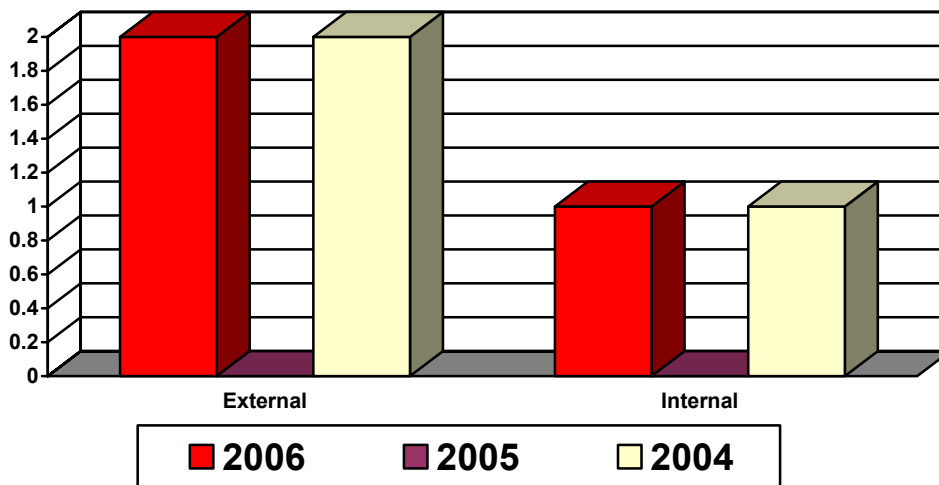
Forest Service Mishap Prevention

This was a new category added in 2004 to attempt to capture the good things that individuals are doing for mishap prevention. We need to do a better job of getting the word out to report the good things occurring.



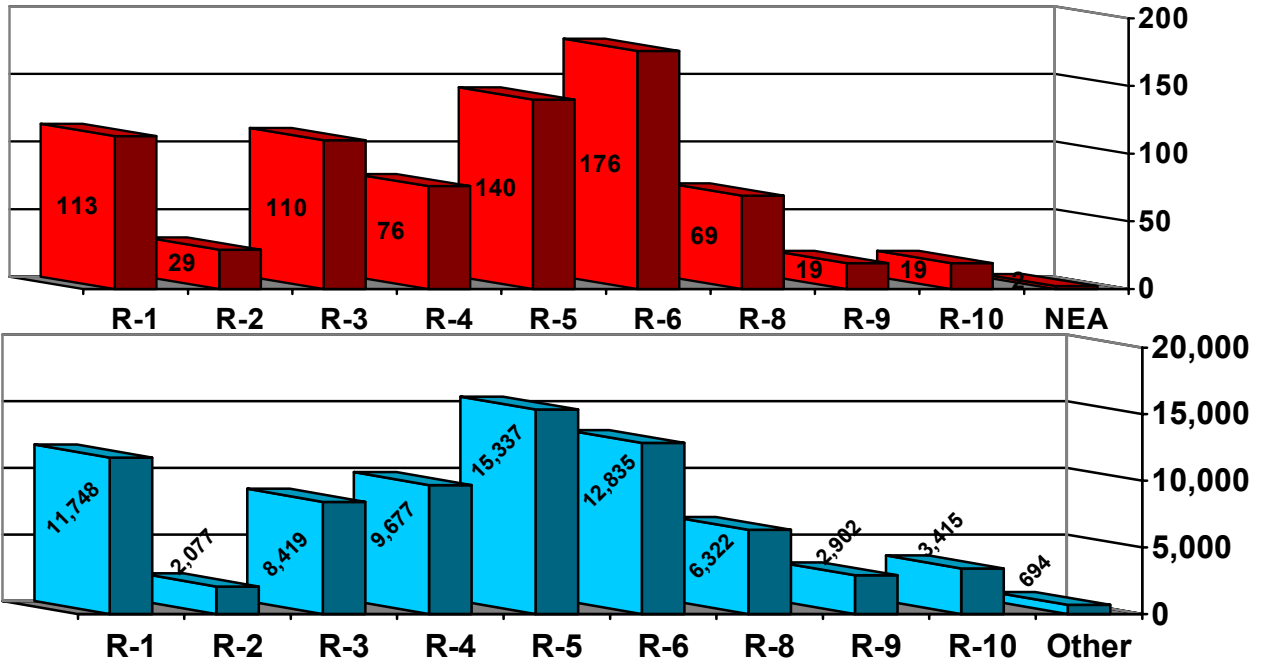
Forest Service Management SAFECOM's by sub-category

Management was a new category added in 2004 as well with the intent of capturing management issues internal to the agency and external.

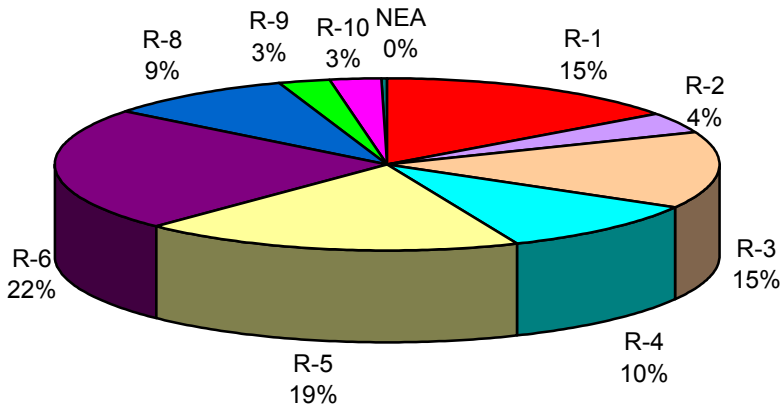


FY 2006 SAFECOM's/Flight Hours by Region

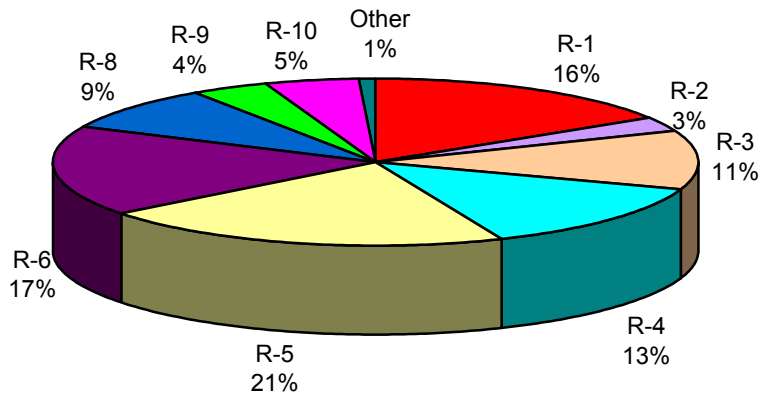
The chart below shows the number of Forest Service SAFECOM's by region reported in FY 2006.



Percent of Safecoms by Region



Percent of Flight Hours by Region



| FY 2006 SAFECOM's by Aircraft Type and Region | | | | | | | |
|--|------------|------------|-----------|-----------|------------|-----------|------------|
| Region | Fixed-Wing | Helicopter | Airtanker | SEAT | USFS Owned | N/A | Total |
| Region 1 | 28 | 63 | 12 | 1 | 6 | 3 | 113 |
| Region 2 | 8 | 17 | 3 | 0 | 1 | 0 | 29 |
| Region 3 | 10 | 57 | 31 | 10 | 1 | 1 | 110 |
| Region 4 | 9 | 43 | 6 | 4 | 8 | 6 | 76 |
| Region 5 | 17 | 97 | 19 | 0 | 1 | 6 | 140 |
| Region 6 | 39 | 118 | 5 | 7 | 4 | 3 | 176 |
| Region 8 | 17 | 42 | 6 | 2 | 2 | 0 | 69 |
| Region 9 | 8 | 5 | 2 | 1 | 3 | 0 | 19 |
| Region 10 | 12 | 7 | 0 | 0 | 0 | 0 | 19 |
| NEA | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total | 150 | 449 | 84 | 25 | 26 | 19 | 753 |

| FY 2006 SAFECOM's by Category and Region | | | | | | | | |
|---|----------|-----------|------------|------------|------------|----------|-------------------|------------|
| Region | Accident | Airspace | Hazard | Incident | Maint. | Mgmnt | Mishap Prevention | Total |
| 1 | 0 | 7 | 44 | 20 | 64 | 0 | 2 | 137 |
| 2 | 0 | 2 | 12 | 5 | 12 | 0 | 0 | 31 |
| 3 | 0 | 9 | 46 | 36 | 78 | 0 | 1 | 170 |
| 4 | 1 | 16 | 19 | 11 | 27 | 0 | 2 | 76 |
| 5 | 0 | 13 | 42 | 17 | 83 | 1 | 2 | 158 |
| 6 | 0 | 23 | 49 | 18 | 134 | 2 | 0 | 226 |
| 8 | 0 | 8 | 15 | 13 | 38 | 0 | 0 | 74 |
| 9 | 0 | 0 | 9 | 0 | 10 | 0 | 1 | 20 |
| 10 | 0 | 1 | 8 | 4 | 7 | 0 | 0 | 20 |
| NEA | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| Total | 1 | 79 | 245 | 125 | 453 | 3 | 8 | 914 |

FY 2006 Forest Service Mishaps



NTSB regulation 831.13 Flow and dissemination of accident or incident information generally states that “Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action.

The NTSB has not finalized or determined probable cause for all of the accidents at this time. This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed

NTSB Identification: [SEA06TA152](#).
Accident occurred Friday, July 28, 2006 near Lowman, ID
Aircraft: Cessna TU206G, registration: N5421X
Injuries: 2 Uninjured.
Operational Control: Region 4, Boise NF



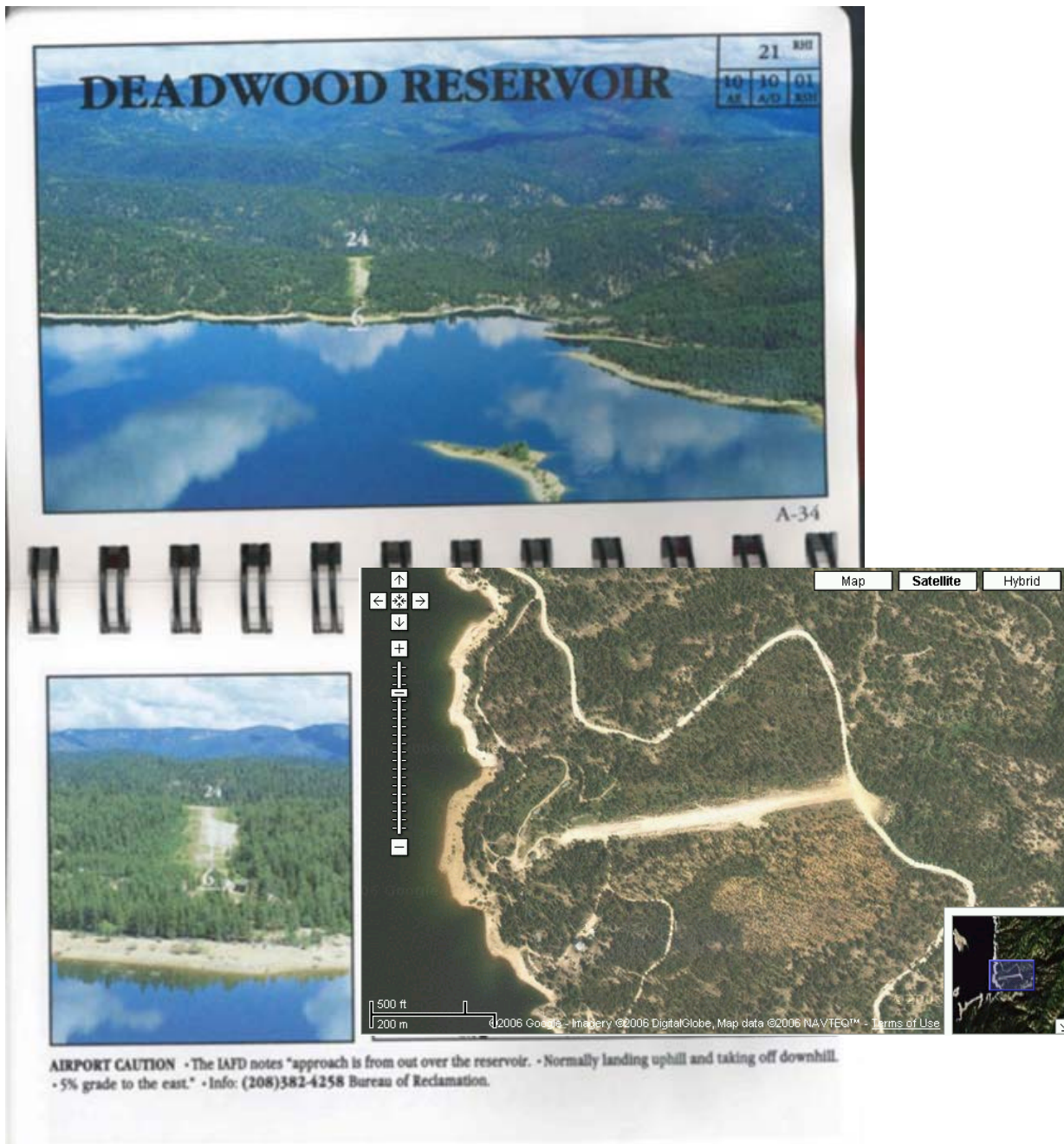
The aircraft was on a Forest Health Protection (FHP) aerial sketch-mapping mission in the Landmark Basin area. The aircraft departed Boise, ID at approximately 0855 MDT with one Forest Service employee on board. The aircraft was flight following with the Boise Interagency Logistics Center (BILC) utilizing Automated Flight Following (AFF). They decided to land at the Deadwood Reservoir Airstrip for lunch.

The pilot of the aircraft stated that on final approach to the airstrip, approximately 50 feet above the runway the aircraft instantly sank. He applied full power, however, in spite of the full power the aircraft continued to sink straight down to the runway.

The aircraft hit hard enough to bounce about 20 yards and right of the centerline of the airstrip. The right wheel went into a ditch, the pilot then applied left full rudder and left brake. The wheel came out of the ditch but the tail hit the ditch berm.

After the aircraft came to rest the pilot shut down the aircraft and inspected the aircraft for damage. The pilot is a FAA licensed Airframe and Powerplant Mechanic. The pilot discussed the extent of the damage to the FS employee and convinced the FS employee that they had no significant damage that would hinder flight capabilities.

The pilot and FS employee got back on board the aircraft and then flew the aircraft to Cascade, ID (approx 15 minutes way). The FS employee stated there were no communications available from the airstrip. It was later determined that through 2 different repeaters communications were available from the landing strip. After landing in Cascade, the FS employee notified the Regional Aviation Safety Manager of the mishap.



Damage was limited to the left side tail section below the level of the horizontal stab. Bulkhead frames and a few stringers were damaged and bent. The exterior skin in this area was also damaged as well as the skin on the underside of the tail cone.

There was no damage to any flight controls, cables, or wing surfaces. A bracket that holds a pulley for one of the elevator cables was deformed but did not displace the alignment of the cable travel.

The National Transportation Safety Board determines the probable cause(s) of this accident as follows: The pilot's loss of aircraft control due to a downdraft on short final followed by an uncontrolled descent to a hard landing.



NTSB Identification: [LAX06GA254](#)

Accident occurred Friday, August 04, 2006 near Happy Camp, CA
Aircraft: Aviation International Rotors CH-54A, registration: N6156U

Injuries: 2 Fatal.

Operational Control: Region 5, Klamath NF



The aircraft's mission was to support fires within the Happy Camp complex with aerial support dropping water/foam. On the morning of the accident, the helicopter went through a series of maintenance flight tests after having its number one engine replaced the night before. The helicopter was returned to service at 1645 by the contractor mechanics and the USFS Aircraft Maintenance Inspector.

The helicopter was then dispatched to the Titus fire where it conducted a number of water drops. After 2.2 hours of flight (at 1902), the helicopter returned to the helibase where it was refueled with approximately 500 gallons and examined by maintenance personnel. The helicopter departed for a second cycle of water drops at 1912, and never returned to the helibase.



Automated Flight Following indicated that the helicopter filled its water tanks at a dip site located in the Klamath River near the Independence Bridge. The helicopter conducted one uneventful dip and water drop during the second cycle and was in the process of conducting its second dip when the accident occurred.

A witness located near the accident site reported that he observed the helicopter come in and out of the same dip site that day filling the helicopter's water tanks. The helicopter was located over the dip site when the witness heard a "loud bang." The witness observed the helicopter flying over a stone riverbed toward the Independence Bridge. He then noticed a large piece fall off the helicopter, which was later identified as the tail rotor gearbox with three of the four tail rotor blades attached to the hub.



The helicopter pitched nose low at an approximate 45-degree nose down attitude while rotating around its vertical axis. The helicopter impacted the opposite side of the river/shoreline. The witness immediately called the USFS to report the accident.

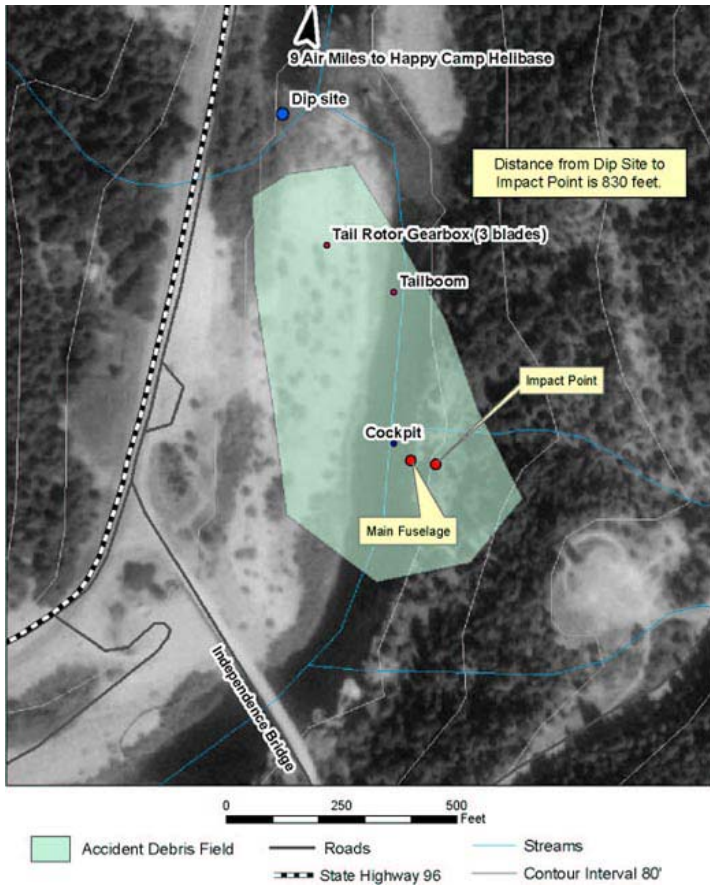
There are four tail rotor blades in the tail rotor assembly. Attached to the tail rotor hub is a spindle for each blade. Each blade is identified by a colored-coded attachment collar and spindle/sleeve (red, yellow, blue, and black). Examination of the tail rotor system revealed that the blade associated with the red collar/spindle was missing and has not been located. The spindle was fractured inboard of where the sleeve assembly would attach to the spindle. It was noted that the location of the fracture would not normally be visible in an assembled component.

The fractured spindle was removed from the tail rotor hub and shipped to the National Transportation Safety Board Materials Laboratory in Washington, D.C., for further examination.



Initial review of the maintenance records, flight logs, and USFS daily diaries revealed that the helicopter accumulated a total of 6,191.6 hours.

On December 22, 2005, the tail rotor hub assembly underwent a overhaul, which included the fluorescent penetrate inspection of the spindle. The tail rotor hub assembly accumulated about 323.6 hours following its last overhaul. The spindle was not a life-limited component.



The National Transportation Safety Board has not determined probable cause at this time.

Identification: [SEA06GA158](#)
Accident occurred Sunday, August 13, 2006 near Yellow Pine, ID
Aircraft: Eurocopter AS-350-B3, registration: N355EV
Injuries: 4 Fatal.
Operational Control: Region 4, Payette NF



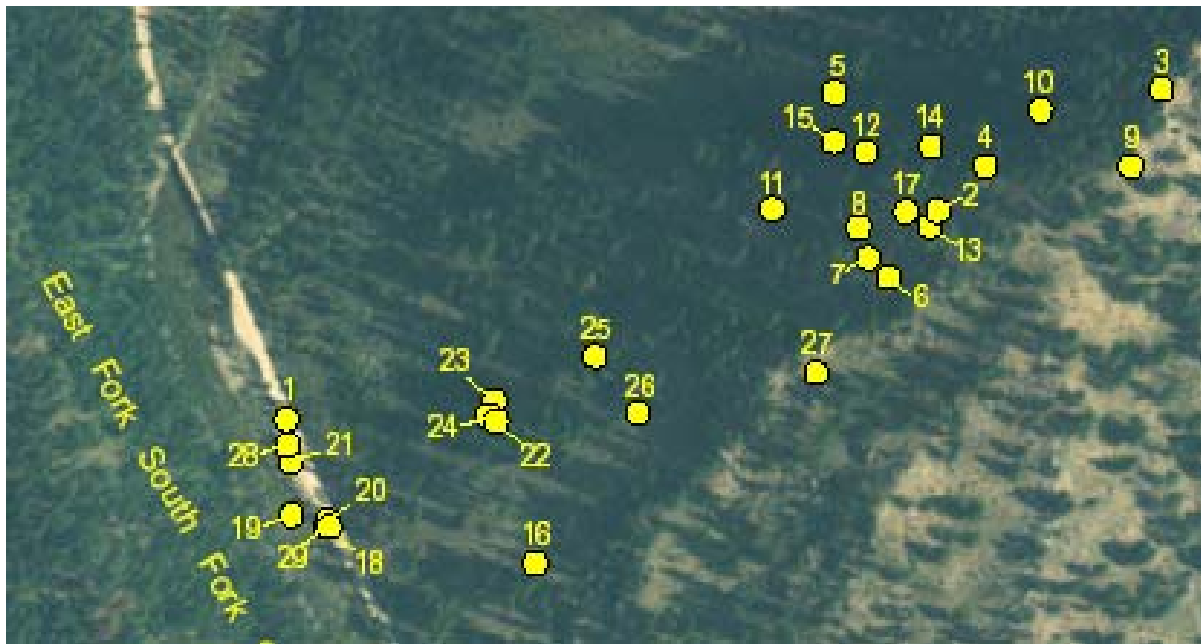
The aircraft was replacing lookout personnel on Williams Peak Lookout, located approximately 4 nautical miles north, northeast from Krassel helibase.

The aircraft was destroyed by fire following impact with the East Fork Rd. (FS Rd. 48) about 18 miles west of Yellow Pine, Idaho. The commercial pilot and three passengers were fatally injured.

The exchange of lookout personnel had occurred, and the helicopter was returning to Krassel helibase when the accident occurred.

At the highest point on the mountain, where the initial debris was found (hence, initial-debris-point, or IDP), there was an uprooted, downed snag (a dead, defoliated conifer). An accompanying forester estimated that it had been 90 feet tall. It was broken into several segments, and was oriented approximately 220 degrees magnetic. Several bits/scraps of paper, some with writing/notes on them, were found within 30 feet of the downed snag. Next down the mountain, from approximately 100 to 600 feet below the IDP, were found thirteen cubitainers (5 gallon plastic containers for potable water), and several cubitainer caps and handles. There were two large plastic refuse bags, yellow crepe paper, and a plastic bread sack. The two large plastic bags were torn, and eleven of the cubitainers had 3 to 9 inch slashes in them. One cubitainer had a chip of blue paint in it, which was consistent with the tail rotor paddle paint. Several green and white paint chips, consisting of aircraft primer overlaid with paint, were found in the same general area.

Approximately 550 feet down from the IDP was another large snag with its top broken off in a 220 degree orientation. Down hill from this was a live conifer with a fresh broken limb. West, for approximately 200 feet and down slope for approximately 200 feet, from these two damaged trees, was found a tail rotor paddle, which had separated at its cuff. Further down slope, approximately 1,450 feet down from the IDP and aligned with the two damaged trees, was found the tail rotor gearbox cover which exhibited evidence of tail rotor drive shaft flailing. Approximately 80 to 90 feet further down the mountain was the upper WSPS (wire strike protection system) guide, and approximately 60 feet below that was the tail-cone with its vertical and dorsal fins. Approximately 400 feet (200 foot elevation loss) further down the mountain was the main wreckage on the road. On the edge of the road was a tree, approximately 4 inches in diameter, whose top had been severed.



The above aerial photo depicts the debris field. Number 1 is the crash site, number 3 is the first impact site (snag), and everything in-between is debris off the helicopter.



The first piece of debris on the road was an external-load viewing mirror, which had been mounted under the pilot's feet on the right side of the helicopter. Approximately 25 feet further, were the two cargo baskets side-by-side. One basket had burned refuse in it; the second basket was crushed flat with one side bent inward, and was empty of cargo. Approximately 15 feet further was the severely burned fuselage, which was followed by the main transmission that had been consumed by post-impact fire. The Starrflex main rotor head lay in its proper orientation to the main transmission; all of its components were present and exhibited fire damage. All three main rotor blades remained attached to their respective blade sleeves. One blade, marked the red blade, had a deformation on the lower surface in its stainless steel leading edge at approximately 8 feet from the center of the mast. This distance was consistent with the distance from the center of the mast to where the WSPS guide was located. All of the blades exhibited impact damage from 20 to 30 inches inboard from their respective tips. All of the main rotor blade tip weights were missing. The three star arms were found fractured at 45-degree angles.



Immediately beyond the main transmission was the engine. It was found upright and aligned approximately 220 degrees magnetic. The turbine blades had separated and were not found at the accident site or in the engine's exhaust duct. Immediately beyond that lay the tail boom, which was inverted and exhibited little fire damage. Both horizontal stabilizers remained attached to the tail boom; the left horizontal stabilizer was minimally damaged, the right horizontal stabilizer was crushed upward, and over onto itself and aft. Approximately 22 feet to the right of the tail boom was the tail rotor gearbox with one paddle still attached; the attached paddle was fractured at its cuff. The aircraft manufacturer's representative said that the tail rotor drive shaft to tail rotor gearbox coupling and the tail rotor drive shaft were both torsionally separated in a direction consistent with sudden stoppage of the tail rotor.

During interviews, four Helitack crewmembers, who were assigned to the helicopter, said the pilot was very skillful. One crewmember described the pilot as "a perfectionist--in everything about his flying--all had to be perfect." They said he did like "showy" flying at times, but would always ask the passengers if they were comfortable. He would "buzz" a ridge every now and then, and perform a maneuver he called the "sleigh ride." One of the Helitack crew members said that a "sleigh ride was where you top a ridge then drop the collective, drop the nose a bit....it was a common maneuver for him."

On September 25, 2006, under the supervision of an NTSB investigator, a post accident engine examination was accomplished at the manufacturer's facility in Grand Prairie, Texas. Three of the five party members attended: The U.S. Forest Service, American Eurocopter, and Turbomeca, USA. Externally, the engine exhibited wrinkling on its right side in the vicinity of the annular combustion chamber, and the exhaust duct was crushed, wrinkled and bent. The engine manufacturer's representative said that the absence of cracks or rips in the mangled exhaust duct suggested that it was at operating temperature when it was deformed. Additionally, he said there was some "dimpling" of the exhaust duct and at least one exit hole as a result of turbine blades leaving the engine.



The disassembly of the engine, by the engine manufacturer, found the centrifugal compressor and its cover exhibited rubbing, rotational scoring and thermal damage signatures indicative of rotation at the time of impact. The power turbine's containment shield/ring exhibited no deformation or elongation. All of the power turbine blades were sheared from the turbine disc at their designed shear points (at the base of each blade); no separated blades were found in the engine. The power turbine casing exhibited rubbing and thermal signatures. The engine manufacturer said that the loss of the power turbine blades in this manner was indicative of an engine over speed event. This will occur, he said, when the engine's load is suddenly interrupted. The free turbine nozzle guide vane (found just in front of the power turbine) exhibited compression/crushing on its right side and rubbing on its aft side. The single turbine wheel (gas turbine) exhibited no mechanical damage, but did exhibit heat damage and discoloration.

The transmission shaft (engine to transmission drive shaft) was found within the wreckage with both flex couplings still attached. The aircraft manufacturer's representative said that the transmission attachment bolts of the forward flex coupling had separated, and the boltholes appeared elongated. The engine attachment bolts of the rear flex coupling had also separated. She said that the "rear flex coupling exhibited deformation consistent with the shaft flailing while still attached to the engine output."



The National Transportation Safety Board determines the probable cause(s) of this accident as follows: The pilot's intentional low altitude flight and his failure to maintain an adequate altitude to clear the trees.



NTSB Identification: [LAX06TA284](#)

Accident occurred Monday, September 04, 2006 near Happy Camp, CA

Aircraft: Bell 212, registration: N873HL

Injuries: 1 Uninjured.

Operational Control: Region 5, Klamath NF



The helicopter departed Happy Camp airport with an external load of cargo on a long line to be delivered to the Titus fire in the Klamath National Forest. Shortly after takeoff (about 30 to 45 seconds), the pilot smelled something burning. He elected to return to the airport as the smell worsened, and then received an engine fire warning light indication and observed smoke. He pulled the number 2 fire extinguisher handle and made a rapid descent to the airport. The pilot dropped the long line and landed without further incident. He shut down the engines, shutoff the fuel valves, and exited the aircraft. The fire had been extinguished and no further action was required.



A post-landing examination of the helicopter revealed that a puncture from the inside out existed in the hot section of the right engine. The engine compartment, engine deck, firewall, cowling attachment point, and other accessories on the right side of the helicopter sustained damage.





The interior of the engine compartment suffered major heat damage affecting the firewall and engine compartment deck due to escaping turbine gases.

The No. 2 (right) engine, a Pratt & Whitney Canada PT-6T-3 (serial number CPPS-61956), accumulated approximately 6,838.4 hours of operation and about 984.6 hours since its last overhaul.

Initial engine teardown analysis determined an internal engine component failure. The engine manufacturer, FAA and NTSB are doing further analysis and metallurgy tests.

The National Transportation Safety Board has not determined probable cause at this time.