Federal Aviation Administration
Alaska Flight Services Information Area Group (AFSIAG)
Staff Study
August 3, 2012

Preliminary Report:

FAA Flight Service Station Contact and Aircraft Accident/Incident Risk Exposure

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1.0 Background: This study is produced in support of the Alaska Flight Services Safety Program. The Safety Program is designed to reduce aircraft accidents in Alaska by encouraging pilots to learn about and use the safety services Alaska Flight Service Stations provide.

1.1 The services delivered include pilot briefing, flight plan handling, inflight communications, clearance delivery, local airport advisory services, Notice to Airmen (NOTAM) classification and dissemination, broadcasts, initiating Search and Rescue, weather observation, pilot weather report solicitation and dissemination as well as other tasks. Approximately 1.5 million services are accomplished annually.

1.2 Federal Aviation Regulation (FAR) 91.103 requires certain action by all pilots in command including that:

"Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

1.3 Typically, since the 1960's, Flight Service Stations have been the primary and FAA approved certified delivery vehicle for general aviation and other operators to obtain pilot briefing information to satisfy FAR 91.103 requirements.

1.4 Since the 1980's, technology and access to weather and aeronautical information has progressed significantly. FAA endorsed delivery includes FSS and web based Direct User Access Terminal (DUAT/S). Many pilots may access and self-brief using sources such as Aviation Digital Data Service (ADDS), Alaska Aviation Weather Unit (AWWU), Alaska Aviation Weather Camera web pages and similar supplemental sources that generally declaim their products and refer the self-briefer to FAA Flight Service Stations for complete weather briefings.

1.5 Intuitively, it might be be anticipated that a pilot who prepares for a flight in accordance with FAR 91.103 and uses the certified professional services and resources of a Flight Service Station would increase the probability for a proper go/no go decision and consequently lower risk exposure for an aircraft accident.

2.0 Facts and Considerations

2.1 FAA Risk Management Handbook (FAA-H-8083-2, page 2-4) refers to traits in pilots prone to having accidents. Among the traits noted are:

> ***Impulsive rather than methodical and disciplined information gathering*** and in the speed and selection of actions taken.
>
> ***Disregard for or underutilization of outside sources of information, including*** copilots, flight attendants, ***flight service personnel***, flight instructors, and air traffic controllers.

2.2 The Journal of Safety Research (Volume 7, Issue 3, 2006, pages 203-208) identifies risk factors for serious injury (fatal and non-fatal) rotary wing accidents in New Zealand. The results noted that:

> The most significant risk factors for all serious injury were:
> ***(a) Not obtaining a weather briefing,***
> (b) Off airport location of the crash site,
> (c) Flights carried out for air transport purposes, and
> (d) Non-solo flights.

2.3 The National Transportation Safety Board Safety Study SS-05/01, Risk Factors Associated with Weather Related General Aviation Accidents, page 47, includes a finding that:

> General aviation pilots routinely consult alternative sources of aviation weather to obtain information that is not currently available from a standard weather briefing.

2.4 Supporting it's finding, the NTSB stated that

> …many pilots use other sources to obtain weather data not included in a standard briefing and then contact FSS or DUATS to fulfill a perceived regulatory obligation. ***This creates the potential for pilot misinterpretation or confusion if weather information***

gathered from various sources appears to be more detailed than the FSS information. ` In some cases, the FAA and NWS contribute to this potential confusion by providing detailed graphical weather products with disclaimers indicating that the products are not suitable to meet the briefing requirement.

2.5 Perhaps the most convincing information concerning the value of contacting Flight Service and getting weather and aeronautical information is referred to in FAA Technical Report SP-94/1LR, General Aviation Preflight Planning to Reduce Accidents.

> ***…70% of the cause/factors of accidents could be attributed to improper preflight planning…Research shows that a fatal weather-involved accident is about 21/2 to 3 times as likely if a flight did not have a weather briefing…***
>
> ***The best estimate is that a 3 percent increase in the percentage of pilots obtaining a preflight briefing would prevent 8.4 fatal GA weather accidents on a yearly basis.***

2.6 Using an average of 1.9 fatalities per fatal GA accident (1985-1989), the FAA benefit/cost methodology and the Department of Transportation value of a life set at $5.8 million dollars, each accident prevented would result in mid-range savings of $11.02 million dollars.

2.7 In 2002, the Kenai Automated Flight Service Station produced a Quality Assurance Staff Study entitled: "Aircraft accidents and services provided". The facility examined 320 aircraft accidents and incidents that occurred during the period 11/30/96 to 12/28/98. The study noted that there were 24 fatal accidents resulting in 55 fatalities. 67% of all accident aircraft received no known flight services. The value of these lives lost is approximately $319,000,000 in 2012 dollars. FAA Alaska Flight Services current operational costs are less than $30,000,000 yearly.

Much progress has been accomplished by the aviation community in reducing accidents. Using updated information, in 2011 there were 11 accidents where at least one fatality was suffered. Only 1 of these aircraft had a Flight Service contact. There were 21 total fatalities. One fatality was suffered by the aircraft that contacted FSS. The value of lives lost is approximately $121,800,000.

Table 2.0 2011 Fatal Accidents and FSS Contacts

Fiscal Year	Total Fatal Accidents/Fatalities	Aircraft Contacted FSS/Fatalities	Aircraft Did Not Contact FSS/Fatalities
2011	11/21	1/1	10/20

2.8 The 2010 FAA General Aviation Survey states that there are 6,113 active GA and Air Taxi aircraft operating in Alaska and that 680,700 hours were flown.

Alaska Flight Services facilities recorded statistical data that 503,395 aircraft flights were contacted in 2011. FAA Order 7210.3, para 16-2-1b states that:

> ***b. One count must be taken for each flight contacted regardless of the number of contacts made with the aircraft during the same flight.***

The Aircraft Owners and Pilots Association (AOPA) has discussed in its web literature estimates that most flights are comfortably conducted aboard aircraft without restroom facilities in legs of 2.5 to 3 hours duration. Using 2.5 hours as an estimated flight of average duration, then the 680,700 flight hours estimated for Alaska GA operations when divided by 2.5 hours results in the estimated total number of flights in Alaska at 272,280, which is fewer than the number of aircraft contacts recorded by Alaskan FSS facilities. This may be explained in part, that when an aircraft contacts a different facility, a new aircraft contact is recorded, thus for example, an aircraft traveling from Kenai, Alaska to Homer, Alaska would result in 2 total system aircraft contacts for the same flight. When enroute radio contacts are made with different FSS specialists at the same facility, it is also likely that an additional aircraft contacted tally may be made, since the specialist may not be aware that the aircraft flight has already been logged as an aircraft contact. It may also be explained by the potential for the estimated trip length average to be greater than the reality that includes many short duration flights.

2.9 Peter V. Agur, Jr., in The Economic Case for High Performance Single-Engine Piston Business Aircraft, (a report commissioned by Cirrus aircraft) cited the following average trip lengths:

King Air 90 (BE90). . . . . 235 miles
Pilatus (PC12). . . . . 239 miles
Embraer Phenom 100. . . . 345 miles
Citation Jet CJ1 (C525). . . . 395 miles
Socata TBM 850 (TBM8) ….418 miles

Given the cruising speed of the above referenced GA aircraft, the individual average flight duration in time would be significantly less than the 2.5 to 3 hours used in this paper's assumption establishing the number of flights compared to flight hours flown in Alaska.

2.10 Assuming that 2.5 hours flight length is a conservative average compared to potentially lower assumed average flight lengths, the derivative estimate following below of how many flights conducted in Alaska that did not receive an FAA briefing is also conservative.

2.11 In 2011, Alaskan FSS's provided 126,367 pilot briefs. If there were in fact 272,280 GA flights in Alaska, then a majority of approximately 145,913 flights (53.5 per cent) did not receive an FAA briefing. It must also be noted that flights sometimes receive multiple briefings until a final go/no go decision is made and then get updated briefings as well enroute. The assumption that there was one briefing per flight is conservative but may in part be balanced by the notion that some proposed flights briefed did not depart. This author, based on personal

experience, believes this estimate may be an underestimate, since flight legs vary in length and duration based on mission requirements.

3.0 What the AFSIAG research and analysis shows:

3.1 This study surveys aircraft accidents and incidents reported from Fiscal Years 2009 through 2011.

Alaska Flight Services analyzed information relating to accidents and incidents reported on FAA Form 8020-9 - AIRCRAFT ACCIDENT/INCIDENT PRELIMINARY NOTICE for the fiscal years of 2009 to 2011. 446 accidents and incidents were reviewed. Of the 446 records, 120 aircraft had contact with FSS, 326 aircraft did not have contact with FSS.

3.2 In FY 2009, there were 158 Alaskan accidents and incidents reported on FAA Form 8020-9 reviewed. 118 reports indicated no services. Of the accident/incident aircraft, 74.6 per cent did not have FSS contact reported.

3.3 In FY 2010, there were 134 Alaskan accidents and incidents reported on FAA Form 8020-9 reviewed. 94 reports indicated no services. Of the accident/incident aircraft, 70.1 per cent did not have FSS contact reported.

3.4 In FY 2011, there were 154 Alaskan accidents and incidents reported on FAA Form 8020-9 reviewed. 114 reports indicated no services. Of the accident/incident aircraft, 74 per cent did not have FSS contact reported.

Table 3.0 Accidents/Incidents and FSS Contacts

	FAA Form 8020-9 Accidents/Incidents	Accident/Incident Aircraft with No FSS Contact	Percentage of Accident/Incident Aircraft with No FSS Contact
2009	158	118	74.6
2010	134	94	70.1
2011	154	114	74.0
Total	446	326	73.1

4.0 Likelihood of an accident/incident

4.1 In 2011, assuming there were 272,280 flights conducted, the likelihood of any single flight being involved in a reported accident or incident would be 154/272,280 or 1 in 2388 flights.

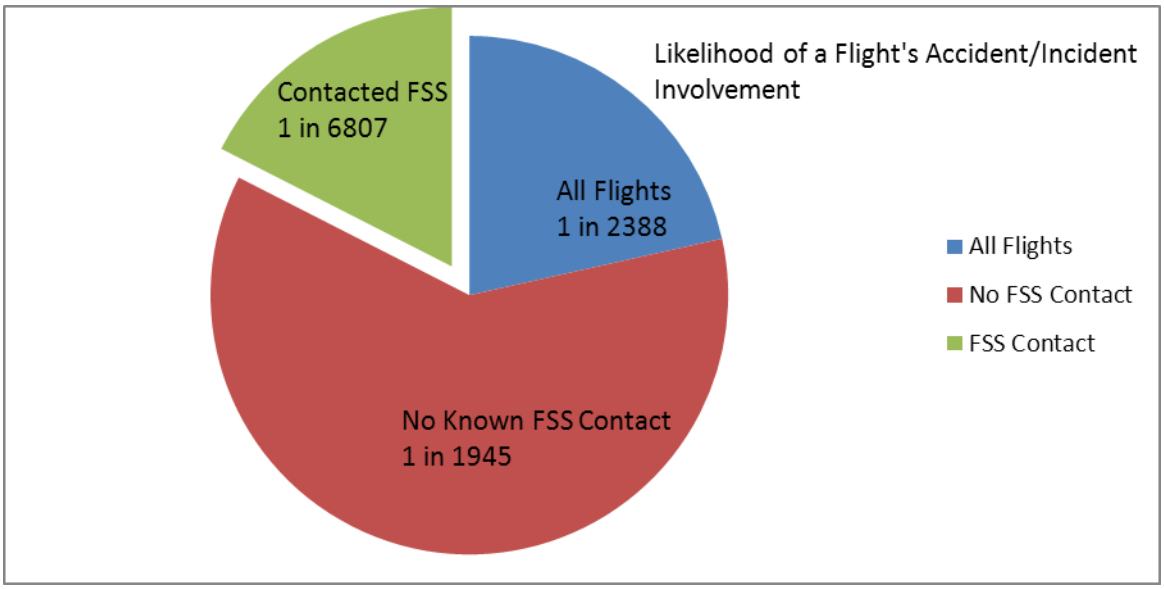
4.2 In 2011, assuming there were 272,280 flights conducted, the likelihood of any single flight which had no FSS contact being involved in a reported accident or incident would be 114/272,280 or 1 in 1945 flights.

4.3 In 2011, assuming there were 272,280 flights conducted, the likelihood of any single flight which had contacted FSS being involved in a reported accident or incident would be 40/272,280 or 1 in 6807 flights.

Table 4.0 Contacting FSS and Accident/Incident Likelihood

FY-2011	FAA Form 8020-9 Accidents/Incidents	Total Number of Estimated Flights	Likelihood of Flight's Accident/Incident Involvement
All Flights	154	272,280	1 in 2388
Flights with no FSS Contact	114	272,280	1 in 1945
Flights with FSS Contact	40	272,280	1 in 6807

Chart 4.0 Contacting FSS and Accident/Incident Likelihood



5.0 Finding:

5.1 An aircraft flight which has contacted FSS is less likely to be involved in a reported accident or incident than the general flight population.

6.0 References

Federal Aviation Regulation (FAR) 91.103

FAA Risk Management Handbook (FAA-H-8083-2)

The Journal of Safety Research (Volume 7, Issue 3, 2006, pages 203-208)

The National Transportation Safety Board Safety Study SS-05/01

FAA Technical Report SP-94/1LR, General Aviation Preflight Planning to Reduce Accidents

U.S. Department of Transportation, Office of the Assistant Secretary for Transportation Policy, Memorandum, Re: Treatment of the Economic Value of a Statistical Life in Department Analyses

FAA, Kenai Automated Flight Service Station Quality Assurance Staff Study: "Aircraft accidents and services provided", 2002

FAA General Aviation Survey, 2010

Aircraft Owners and Pilots Association, Turbine Pilot, April 2002

The Economic Case for High Performance Single-Engine Piston Business Aircraft, (a report commissioned by Cirrus aircraft)

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