VFR into IMC Safety Seminar

FAA Flight Standards Perspective

Federal Aviation Administration

Presented to: NTSB Training Center

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Agenda

TWO ASRS Reports

Why do Pilots fly VFR to IMC

Scholarly Research

FAA Research

NTSB Recommendations

FAA Emphasis Areas

FAA Collaboration – GAJSC / IHST / USHST

Final Comments / Questions

Decision Making – VFR into IMC

ASRS Report 1071634 – PA28 1/3

Contacted Chicago flight watch on 122.0 for weather at our destination.

I also provided flight watch with a PIREP relating to observed conditions.

As I proceeded west, flight watch advised us that at Marshall County/C75 conditions were clear below 12,000. I contacted Chicago Center for flight following and was given a transponder code.

Upon arrival to C75 I found that the field was overcast. Contacting Chicago for weather they replied that C75 was still clear below 12,000. The AWOS at C75 was also broadcasting that same information.

As my fuel level was low and there was not an airport within reasonable distance that was reporting clear conditions, I made the decision to enter the layer and land at C75.

Decision Making – VFR into IMC

ASRS Report 1071634 – PA28 2/3

This was completed successfully, But In my descent, I lost contact with Chicago.

Approximately 15 minutes after landing I was met by a police officer asking us if we had just landed. Apparently they were contacted by Chicago.

I had the officer observe the weather on the FBO display monitor and make an outside visual observation that indeed the AWOS was reporting incorrectly.

The airport manager for C75 was contacted and appraised of the fact that the AWOS was reporting incorrect information.

He informed me that he was aware of the problem and had been aware of it for some time. He did not seem willing or able to remedy the situation.

Decision Making – VFR into IMC

ASRS Report 1071634 – PA28 3/3

As this posed a significant hazard to my flight operations that day, please enter in to the NOTAMs that the AWOS at C75 is inaccurate.

Flight watch and Chicago Center had no idea that the information they were giving to me was incorrect.

Had it been know that the AWOS weather information was unreliable or if the AWOS had simply been disconnected or turned off, we would have returned to our home base with little effort or effect.

My apologies for any problems that I may have caused. I would like to thank the folks at Chicago as they assisted professionally and promptly when needed.

Decision Making – VFR into IMC

ASRS Report 1053732 – R22 Helicopter 1/3

My student and I departed...under VFR conditions...well after the fog had cleared for that morning.

The clouds were high and we could see for miles on end. We flew GPS direct...and [then] the clouds became lower, going from 1,000 FT AGL to 600 FT AGL as well as there being some fog near the ground that was thinning.

We decided to proceed north...around protected airspace...and then head west towards [an] airport, which had better weather reported.

We were able to maintain VFR separation at 600 FT MSL (300 FT AGL) until we reached the northern tip of the protected airspace, where we hit some low, dense fog.

Decision Making – VFR into IMC

ASRS Report 1053732 – R22 Helicopter 2/3

Knowing that there was better weather nearby, my student and I continued onwards, flying a gradual descent to stay clear of the clouds.

We reached a point at about 200 FT AGL where we could no longer fly any lower due to the terrain and tall trees and decided to turn around and abandon our cross country.

As we began the turn we entered the clouds and inadvertent IMC.

Since we couldn't see any obstructions around us we decided to also climb back up to 700 FT MSL (400 FT AGL) to avoid hitting anything in the turn.

We then became disoriented and entered into a low-g pushover. Soon afterwards we came out of the clouds with the nose pointed straight down and I recovered from the pushover.

Decision Making – VFR into IMC

ASRS Report 1053732 – R22 Helicopter 3/3

We landed in a field nearby to assess any damage to the helicopter and upon finding nothing severely damaged, we picked up and flew the helicopter directly back to our [home field].

In hindsight we should've abandoned the cross country sooner instead of pushing into the clouds.

Had we decided to land at the intermediate airport or turn around to go back home we wouldn't have entered the clouds and become disoriented.

Decision Making – VFR into IMC

Why do pilots continue to fly VFR in IMC conditions?

Answer:

- Juliana Goh & Dr. Douglas Wiegmann, University of Illinois, Human Factors Division, 2001

Decision Making – VFR into IMC

Why do pilots continue to fly VFR in IMC conditions?

Answer: Risk perception?

- Juliana Goh & Dr. Douglas Wiegmann, University of Illinois, Human Factors Division, 2001

Decision Making – VFR into IMC

"Pilots are overconfident in their abilities and do not fully appreciate the risks of flying into adverse weather.

Indeed, much of pilot training involves teaching **pilots to feel confident in their ability** to control the aircraft in all flight regimes.

However, **an unfortunate by-product** of this training may be a degree of **overconfidence** in one's skill level and

an **unrealistic optimism about the chances of avoiding harm** through personal control."

- Juliana Goh & Dr. Douglas Wiegmann, University of Illinois, Human Factors Division, 2001

Scholarly Research & Data

Of the pilots involved in "VFR Flight into IMC" accidents:

- 71% held a Private pilot Certificate
- 52% had **less than 500** total flight hours
- 46% had **less than 100** flight hours in the type aircraft
- 77% were not instrument rated
- 57% had less than 20 hours of instrument flight time

Source: Aviation Safety: VFR into IMC Accidents, Joel A. Rogers, 1994

Scholarly Research & Data

VFR into IMC accidents are preventable!

Pilots must be able to recognize and accept

the seriousness of flying into poor weather

Recognize the need for **immediate action**

to ensure the aircraft gets safely on the ground.

Source: Aviation Safety: VFR into IMC Accidents, Joel A. Rogers, 1994

FAA Research & Data 1/2

A 2004 review of Alaska VFR into IMC accidents of 14 CFR Part 135 on-demand Operators from 1983 to 2000 showed:

73% of pilots were aware of existing instrument conditions prior to event,

59% of the time it was as forecast, 7% worse than forecast

67% of accident aircraft were instrument approach capable

69% of pilots were instrument rated but not current

53% of accidents within 25nm of departure airport, 28% within 5nm

Source: Review of Accidents, George Kobelnyk, AAL-242, 2004

FAA Research & Data 2/2

A 2004 review of Alaska VFR into IMC accidents of 14 CFR Part 135 on-demand Operators from 1983 to 2000 showed:

56% of accidents occur on the first outbound or inbound leg of route

75% of accidents occurred in daylight hours

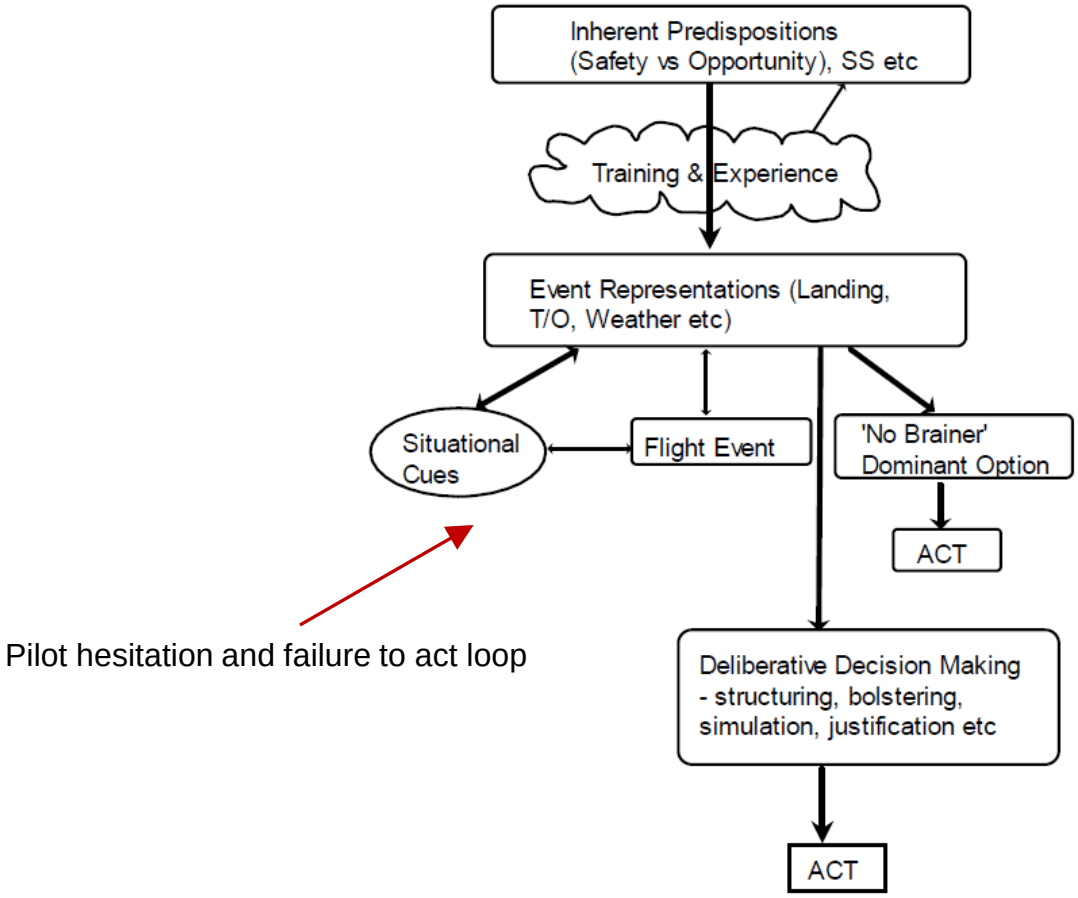
59% occurred in single engine land reciprocating aircraft

50% of IMC conditions were encountered in cruise flight

33% of accidents were noted that the pilot continued taking no corrective actions

Source: Review of Accidents, George Kobelnyk, AAL-242, 2004

FAA Research & Data



Source: Continued VFR into IMC, David O'Hare, PhD and Douglas Owen, University of Otago, 1999

NTSB Recommendations

(VMC into IMC affective recommendation activity with FAA Flight Standards) 1/2

SUMMARY

1. Periodic training and evaluation may be necessary to ensure that pilots maintain **weather-related knowledge and skills**. Evaluate weather analysis abilities when conducting a Flight Review.

2. Knowledge and practical test failures are both associated with a higher risk of a pilot being involved in a weather-related general aviation accident. A pilot can incorrectly answer all questions relating to weather on an airman knowledge test and still receive a passing score on the test. Introduce weighed testing.

NTSB Recommendations

(VMC into IMC affective recommendation activity with FAA Flight Standards) 2/2

SUMMARY

3. A history of **accident or incident involvement** is associated with a higher risk of being involved in a future weather-related general aviation accident.

Where training is conducted, might impact risk. Improve surveillance.

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

FAA Emphasis Areas

All Pilot Applicants must receive training regarding:

- How to avoid hazardous weather whenever possible
- Preflight actions and weather briefings
- Private Pilots 3 hours of training with sole reference to instruments. This includes course reversal, straight and level flight, climbs, descents, turns, recovery from unusual attitudes
- Instrument rating includes 40 hours actual or simulated instrument flying with at least 15 hours of instrument flight training.
- 6 month currency requirements, Flight Review, Instrument Profciency Check
- Emphasis on CRM, Risk Management, Decision Making

FAA Emphasis Areas

Areas left for improvement:

– Recreational or Sport aircraft typically not equipped for instrument flight

so requirements for certificates do not include training with sole reference to instruments.

Evaluating impacts.

– Pilots generally obtain weather knowledge through formal training

cannot be expected to acquire it on their own as they simply gain flight experience.

Researching options.

FAA Collaboration – GAJSC

SE-2

To reduce the risk of inadvertent stall/departure resulting in loss-of-control (LOC) accidents, the GA community should install and use AOA-based systems for better awareness of stall margin and offer safety benefits for airspeed/energy state awareness. Concepts such as fast/slow cues and pitch limits are examples of AOA-based information.

•The industry and FAA will develop a public education campaign on the safety benefits of AOA systems supplementing existing stall warning systems.

•Owner/operators should be encouraged to install AOA systems into the existing fleet.

•AFS-800/-200 in coordination with AFS-600 establish policy and implement AOA education and training in coordination with the training community through appropriate to handbooks, ACs or policy.

FAA Collaboration – GAJSC

SE-3

To reduce the risk of loss-of-control accidents, the GA community should develop and implement a flight safety program focusing on aeronautical decision making (ADM).

The initiative should focus on ADM in preflight planning; professional decision making; flight risk assessment tools (FRAT); and stabilized approaches, missed approaches, and go-arounds.

•A public education campaign raising awareness of the need for ADM, with an emphasis on preflight planning.

•The FAA and industry will promote the use of FRATs with associations, type clubs, and operator groups.

•The FAA and industry review and improve scenario-based training and educational materials promoting ADM.

FAA Collaboration – GAJSC

SE-12

In order to reduce the risk of accidents due to weather-related factors, pilots should rely upon accurate real-time weather reporting.

Further, there are current weather reporting technologies available about which some pilots may not be aware.

•Deploy cost-effective technologies that can provide real-time weather information (including actual conditions as viewed through a remote camera) at remote airports.

•Deployment of the weather/camera system on airports that have had a higher incidence of weather-related accidents or have unique local weather phenomena. These locations will be determined based on a risk assessment.

FAA Collaboration – GAJSC

SE-24

Best practices regarding single-pilot CRM will be identified.

The identified best practices should be communicated to the GA community through a public education campaign.

•The FAA and industry will identify the best practices regarding single-pilot CRM.

•The FAA and industry will conduct a public education campaign emphasizing the best practices regarding single-pilot CRM operational techniques.

FAA Collaboration – GAJSC

SE-27

Review 14 CFR part 21 § 21.8 and 21.9, and make sure that these rules are not unintentionally producing roadblocks to the installation of non-required, safety-enhancing equipment.

If these rules are creating an unintended roadblock, create paths that are more cost effective up to and including using the exemption process.

•FAA evaluation of rules to identify areas where their compliance costs far exceed the safety value provided.

•Recommendations can be made for changing these requirements.

FAA Final Comments

There are many initiatives currently underway in the agency that affect the issue of VMC flight into IMC conditions, beyond Flight Standards.

Funding and personnel requires prioritization of tasks and assets.

Prioritization ensures the greatest improvements to the NAS are managed first

The FAA and Flight Standards continually evaluate these needs and balance costs versus benefits.