

A Pilot's Guide to Safe Flying

For GA, Sport and Recreational Pilots

Second Edition

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Minimizing the Risk

1

General aviation is a relatively safe activity provided suitable account is taken of the limits of airplanes and the fallibility of human beings. If these factors are not taken into consideration, the results can be serious (sometimes fatal) as evidenced by ongoing accidents. Most of these (approximately 80%) are the result of human related factors, many of which can be attributed to the pilot. That is, pilot error.

What can be classified as pilot error?

Here are some pilot-related factors that have contributed to accidents:

- ▶ Inadequate preflight preparation or planning.
- ▶ Improper pilot technique or procedure.
- ▶ Mismanagement of fuel or fuel systems.
- ▶ Improper in-flight decisions and planning.
- ▶ Lack of familiarity with the airplane.
- ▶ Attempted operation beyond experience and ability.
- ▶ Selection of an unsuitable area for takeoff or landing.
- ▶ Attempted visual flight into instrument meteorological conditions.
- ▶ Failure to see and avoid objects or obstructions.
- ▶ Improper loading of the airplane.
- ▶ Failure to extend the landing gear.
- ▶ Continued flight into known adverse or deteriorating weather.
- ▶ Self induced pressure or pressure from others.

And the list goes on!

However, accidents due to pilot error *are avoidable* if we understand how to *minimize the risk*.

Most activities we undertake in life involve some element of risk. General aviation is no exception, although the degree of risk can vary significantly depending on the circumstances and choices we make. For example, a short flight on a calm sunny day involves far less risk than a cross-country flight over high ground in extreme weather. Therefore, in order to fly safely we must be able to assess and manage risks. This involves:

- ▶ Being aware of the risks by analyzing what could go wrong. For example, by carrying out a “what if” exercise.
- ▶ Understanding the relative level of risk. That is, your ability to cope with any risks and the consequences if that is not possible.
- ▶ Taking appropriate action to ensure that the risks are minimized or even eliminated.

However, in order to minimize risk, we must in turn control errors. Pilot error can simply be defined as, an action or in-action by the pilot that results in a decrease in the margin of safety. While many errors are minor and are of little consequence, some have the impact of increasing the level of risk. For example:

- ▶ Taking a chance that the weather will improve is an error in judgment and decision making that can increase the risk of hazardous weather being encountered.
- ▶ Having an inadequate awareness of how to avoid and handle airframe icing is an error in preparation (lack of knowledge) that can increase the risk of losing control of the airplane.
- ▶ Switching to the wrong fuel tank is an error in carrying out an operational procedure that can increase the risk of fuel starvation.
- ▶ A poor landing approach is an error in proficiency that can increase the risk of a landing accident.
- ▶ Misunderstanding an ATC instruction is an error in communications that can increase the risk of a mid-air collision.
- ▶ Not detecting a drop in the manifold pressure, at an early stage, is an error in checking that can increase the risk of an engine failure.

Investigation and research has shown that most accidents are, in fact, the result of a sequence of errors - known as an error chain. As this chain grows, so does the risk of an unsafe outcome to the flight. An example of an error chain, leading to an accident, is as follows:

- ▶ Being in a hurry.
- ▶ Not obtaining a weather forecast.
- ▶ Not recognizing the hazardous weather warning signs.
- ▶ Succumbing to “get-thereitis” and pressing on despite deteriorating weather.
- ▶ Not being proficient at instrument flying and becoming disoriented in cloud.

While it is not practicable to eliminate all human error, it is possible to limit the effect of errors by limiting their occurrence and breaking the error chain. In the above example, had the hazardous weather signs been recognized and an early decision made to return, then the accident could have been avoided. Better still, had the desire to hurry been seen as a warning sign and the flight postponed, then the chain would have been cut at the very outset. As Barry Schiff noted in the

November 2000 issue of AOPA Pilot, "Being aggressively safe means that pilots should regard every out-of-the-ordinary or unexpected event, however innocuous it might appear, as the possible first link in a chain (of errors) that leads to an increasing degradation in safety. The idea is to do whatever is necessary and practical to break that link as soon as possible."

The key to safe flying, therefore, is to minimize human errors and break any error chain before unacceptable risks are taken. This is not as difficult as it might seem if you follow four simple strategies:

▶ *Have the right mental approach to flying.*

Risk minimization starts by having the right mental approach. This involves avoiding attitudes and behaviors that are hazardous to flight such as "get-thereitis" or "it will never happen to me". Pilots must understand their limitations, and have an ability to make judgments and decisions that lead to safe outcomes, including knowing when not to fly.

▶ *Be thoroughly prepared for a flight.*

In many ways, this is the key to safe flying. It begins with checking to see that your knowledge and proficiency matches the needs, as well as the potential needs, of the flight. This is followed by thorough, and unhurried preflight planning, where all the relevant issues, options and risks are considered and assessed. The airplane must then be inspected thoroughly with an understanding of what is being examined and why. Finally, you must be mentally prepared for the expected as well as the unexpected, so that you will be in the best position to adapt and safely cope with any situation that may arise.

▶ *Avoid "cockpit" errors.*

"Cockpit" errors are those that arise from circumstances generated in the cockpit, such as failure to detect a fault at the earliest opportunity or becoming stressed and making errors as the result of getting "behind the airplane". Avoiding these errors requires a disciplined approach to checks, staying ahead of the airplane, avoiding distractions, avoiding communication breakdown and maintaining situational awareness.

▶ *Avoid and manage potential hazards.*

Risks can arise from errors made in judgment, procedures, communication or proficiency, with respect to any number of possible hazards (e.g. deteriorating weather, icing, short runways, illusions, equipment failure, hypoxia, fatigue and so on). Avoiding such errors requires the application of recognized strategies and tactics for either avoiding the hazards, or, if all else fails, ensuring that any hazards are managed in the safest possible manner.

Application of these strategies provides a sound basis for error avoidance, detection and mitigation, and is discussed in detail in the subsequent sections of this manual. It permits pilots to sense when something is wrong, consider the options and take whatever corrective action is appropriate, thus breaking the error chain.

Most accidents are therefore avoidable, and pilots who *actively assess and manage flying risks* can significantly improve their level of safety.

The Right Mental Approach

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It is an established fact that a pilot's mental and emotional makeup is a factor in many accidents. Our mental mindset frequently determines our motivation, our reaction to situations in which we find ourselves and influences our ability to make safe judgments and decisions. *The right mental approach* is therefore vital.

Avoiding Hazardous Attitudes

Courtesy of Australian Transport Safety Bureau



"One of the factors that may have contributed to this accident was that the pilot probably had a strong desire to reach the planned destination"

A pilot's behavior is generally governed by his or her attitude towards a particular situation. Attitude can be defined as a person's predisposition to act or respond in a certain way. For example, some people may have a general disregard for rules and procedures and will often ignore them if, in their opinion, it is "safe" to do so. Such an attitude, when flying, can potentially have dangerous consequences. In fact, it has been shown that certain attitudes, known as hazardous attitudes, have been linked to a significant number of general aviation accidents. These attitudes lead to poor judgments and decisions affecting both low time and experienced pilots. Furthermore, hazardous attitudes are present in all of us to some degree, and we may, therefore, need to consciously counter any adverse tendencies if we are to avoid increasing the risk of having an accident.

Hazardous Attitudes

The United States Federal Aviation Administration (FAA) has identified five hazardous attitudes to aviation, known as: anti-authority, impulsiveness, machoism, invulnerability and resignation.

Anti-authority

Anti-authority reflects resentment of supervision and authority. It is found in pilots who do not like anyone telling them what to do or simply regard rules and procedures as unnecessary.

"Bureaucracy is a waste of time."

"Checklists are for other people."

"Rules were made to be broken."

"Don't tell me."

"Planning is only for pilots without experience and skill."

Impulsiveness

Impulsiveness indicates a lack of thinking before acting. Pilots with this attitude often do the first thing that comes to mind, irrespective of the alternatives.

"I'm sure the weather will be alright."

"I must get there."

"I just have to takeoff."

"I must land the airplane now."

"I'm in a hurry."

Machoism

A macho attitude denotes a pilot who tries to prove they are better than anyone else or is simply showing off. They are risk takers.

"I'll show them."

"I can make it."

"I don't need any help."

"I'm not going to let this beat me."

Invulnerability

Many people, while knowing full well that accidents occur, think that it will never happen to them. Pilots who feel they are invulnerable will often take unnecessary risks and will be unprepared in an emergency.

"Accidents only happen to others."

"It won't happen to me."

"But I've done it before."

"I wouldn't make such a stupid mistake."

Resignation

Resignation reflects an attitude where pilots feel they cannot influence the outcome of things that happen to them. In many cases they consider it simply good luck or bad luck.

"What's the use."

"It won't make any difference."

"It's going to happen anyway – why fight it."

"Things always work out."

"I want to please."

Hazardous attitudes, in turn, reflect themselves as unsafe behaviors. Some examples are:

- ▶ Letting others influence your behavior, irrespective of your better judgment.
"But I know someone else who did it."
"I'll go along with what the group thinks."
- ▶ Allowing pride, ego and emotion to get in the way of good judgment.
- ▶ Being complacent.
"I checked the fuel last night."
"The weather at this time of the year is so predictable."
"I'm too experienced for that."
- ▶ Being intolerant and impatient.
- ▶ Succumbing to "get-thereitis"
(i.e. trying to complete a flight as planned irrespective of the risks).
- ▶ Being arrogant.
- ▶ Being overconfident in your abilities
(i.e. having a false sense of security).
- ▶ Disregarding the airplane performance envelope and limits.

Pilots exhibiting these attitudes and behaviors take unnecessary risks and generally "get away with it" for a time, which simply reinforces their approach. However, statistics show that with such attitudes, the risk of making errors increases, thus increasing the probability of having an accident. It is, therefore, important for pilots to counter any hazardous attitudes and develop safe attitudes and safe behaviors.

Countering Hazardous Attitudes

It must be recognized that experience and skill cannot necessarily counter accident proneness brought about by hazardous attitudes. Furthermore, some hazardous characteristics are considered quite normal (even encouraged) in a non-flying environment. Pilots therefore need to:

- ▶ Be aware of any hazardous attitudes or behavioral traits they may have.
- ▶ Counter any hazardous attitudes.
- ▶ Adopt safe attitudes and behaviors.

An awareness of your personality, in terms of what hazardous attitudes you may have, can be obtained by completing the FAA self-assessment inventory. This can be found in the FAA Accident Prevention Program publication FAA-P-8740-53, Introduction to Pilot Judgment.

The next step is to continually examine your own thinking and, when a hazardous thought is recognized, counter that thought by an appropriate antidote thought from the following antidotes spelled out by the FAA:

Hazardous Attitude	Antidote
Anti-authority	Follow the rules. They are based on experience and are usually right.
Impulsiveness	Not so fast. Think before acting.
Invulnerability	It could happen to me.
Macho	Taking chances is simply foolish.
Resignation	I'm not helpless. I can make a difference. I am not going to stop trying.

The antidotes should be memorized for each of the hazardous attitudes so that they automatically come to mind when needed.