

Volunteer Pilots

Recommendations For Enhanced Safety

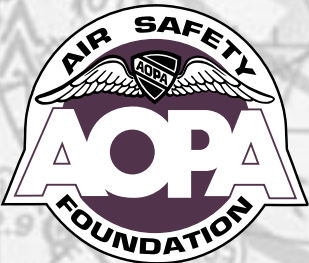


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Special Thanks
to the Air Care Alliance
and its volunteer pilot organization groups.

The recommendations and suggestions contained in this booklet were compiled by the AOPA Air Safety Foundation to promote aviation safety especially with regard to charitable volunteer flying.

This document provides a set of recommendations through which individual pilots can improve their levels of performance and the safety of their flying. It is dedicated to the men and women who selflessly give of their time and talent to ensure that those in need receive help.

Application of recommendations

This document presents suggestions—not mandatory requirements—to use in providing volunteer pilot organizations (VPO) services in the hope that they will enable pilots to provide better and safer service to their passengers.

This document assumes pilots will meet or exceed performance levels cited in the Federal Aviation Administration (FAA) Practical Test Standards appropriate to their certificates and ratings.

It is difficult to design a single set of recommendations that will accommodate the diversity of experience and proficiency among pilots of volunteer pilot organizations (VPO). Recent experience and weather minimums pose another problem; for example, suggested VFR minimums in mountainous areas are a 5,000-foot ceiling and 10 miles visibility. This may be more than adequate for flights in the Appalachian Mountains of Pennsylvania but could be unsafe in the Rocky Mountains of Colorado. Pilots should review all the recommendations and modify them to reflect their experience, the aircraft, and the operating environment.



Members of many volunteer pilot groups meet periodically to provide support to each other and address issues of mutual concern, as in this Air Care Alliance conference.

Preface

Private pilots, whether flying a business associate for a friendly game of golf, a neighbor to the hospital, a time-critical organ from one city to another, or desperately needed materials for disaster relief, are all operating under the same set of rules—Federal Air Regulations, Part 91—and are considered equal under them. The sense of urgency, or “Mission Imperative,” however, can vary tremendously and bear directly on the pilot’s ability to make a sound go or no-go decision. In recognition of the supreme importance of clear judgment in flight safety, the following information has been provided as a point of departure for pilots—especially those engaged in volunteer activities—to study and evaluate so that their flying activities may be safe and enjoyable to themselves and their passengers, and an asset to their communities.

Volunteer pilots have provided charitable transportation to thousands of non-critically ill people for more than 20 years as part of an uninterrupted history of community-service-related flying going back to the beginnings of American aviation. These pilots and the general aviation industry have received excellent recognition from the medical community and the public. With such high visibility and expectations, volunteer pilots strive to make each flight as comfortable and as safe as they can for their passengers. Many pilots have found that the use of enhanced personal minimums has contributed to the safety of their flights.



A child with cerebral palsy is transported from Detroit to Chicago

Introduction

Mission

Perhaps the most common form of volunteer flying is by members of volunteer pilot organizations (VPO). Here the pilot's mission is to provide safe and comfortable air transportation to passengers who must travel considerable distances for various medically-related reasons.



Volunteer pilots took several children who were on kidney dialysis to a special camp in Wisconsin.

Reasons for Enhanced Personal Minimums

VPO flying is conducted under Part 91 of the Federal Aviation Regulations (FARs), General Operating and Flight Rules. These regulations permit properly qualified individuals to operate aircraft over a wide range of operational situations with minimum restrictions. By developing good personal operating practices, pilots can go the extra mile in striving for a high level of service and safety.

The Mission Imperative

One thing that characterizes most pilots is a sense of "mission." There is a strong desire to complete the assigned task and this can cause pilots to put considerable pressure upon themselves. It is a significant factor in personal flying but it can be even more compelling in VPO operations where many people, including the passenger, his family, and medical personnel, are affected by a decision to fly or not to fly. Using the recommendations in this booklet can facilitate the decision process.

While no VPO will put pressure upon a pilot to fly, all pilots must recognize the insidious effect of the mission imperative. The urge to press on, when under a more neutral circumstance they might question that decision, is a sure indication that the process is being influenced. Many commercial medical

transport operations do not tell their pilots about the nature of their passengers or cargo. The crew doesn't know if the trip involves a critically injured child, a desperately needed organ donation or a more routine delivery. This is done, by design, to take pressure off the flight crew to fly when it is not safe. There is nothing gained by putting two or three more people at extreme risk in a non-emergency VPO mission regime.

VPO flights, by definition, are not life critical, whereas any flight on a particular day might become so through changing circumstances. We have all flown on the airlines when a trip has been cancelled or diverted and the crew is not blamed for the change. It is inconvenient and in some cases expensive, but safety always takes priority. It's an idea that pilots and their passengers can live with.

Safety Overview

The principal objective in any flight operation is safety and this is no less true in VPO operations.

Although no pilot deliberately tries to be unsafe, **there is a wide gap between actively managing safety and merely letting it happen.** Safety is a mind-set that weighs every action carefully to evaluate the consequences. A conservative approach will result in safer flights.



Be alert for crosswind and gusts when landing. Pilots have more accidents when landing than in any other phase of flight.

Safety is truly the pilot's job, and VPO pilots should ensure that all operations are conducted safely. How should safety be implemented and maintained? First, understand the nature of general aviation accidents and study the safety record.

The Accident Record

The FAA and the National Transportation Safety Board (NTSB) collect accident data. The AOPA Air Safety Foundation analyzes general aviation accidents to learn from them and alerts pilots to hazardous operational areas. Some facts:

- There are approximately eight general aviation accidents in the United States for every 100,000 flying hours—a fatal accident occurs approximately 1.5 times during the same period of exposure.
- The accident rate has declined over the past 15 years with only minor variations occurring from year to year. The record is gradually improving.
- Nearly three-fourths of all accidents are attributed to human-related causes, principally pilot error.
- Weather accidents, particularly attempted VFR flight into instrument meteorological conditions (IMC), produce the highest fatality rate of all accident types. This is especially true for more sophisticated aircraft and during night flight.
- The fatal accident rate for IMC flight is almost three times higher than VMC flight.
- Wind is a factor in about half of all weather-related accidents. The largest number occur on landing, as a result of loss of control during crosswind and gusting conditions.
- Maneuvering flight (stall/spin or collision with terrain, wires, or towers) produces the second highest frequency of fatal accidents.
- Approach accidents, particularly those associated with IFR operations, frequently involve fatalities.

By focusing on these and other accident factors, pilots can avoid potential problem areas.

For more details on general aviation accidents, send \$2 with your request for the Nall Report to AOPA ASF, 421 Aviation Way, Frederick, MD 21701, or access it on the web at www.aopa.org/asf.

Pilots

Beyond the Basics

The FAA defines minimum currency requirements for pilots flying passengers under day and night VFR conditions. IFR operations have their own set of minimums and currency requirements. It should be stressed that these are minimum requirements. Individuals may set higher personal standards for specific operations to enhance safety. Currency does not necessarily assure proficiency in a set of piloting tasks.

Currency

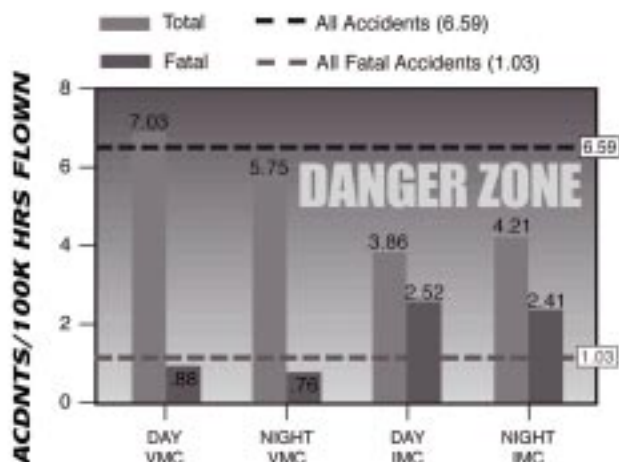
Pilots must comply with FAR Part 61 currency requirements prior to carrying passengers or operating under IFR. These currency requirements do not prevent a pilot from adopting higher personal minimums.

For example: Because lack of recent experience is a significant factor in aircraft accidents, a pilot might consider increasing personal minimums for the general experience requirements (FAR 61.57[a]) to three takeoffs and landings within the preceding 60 or even 30 days prior to carrying passengers.

It might be desirable to include a cross-country flight of at least 100 nautical miles (nm) as pilot in command within the previous 60 days. This would ensure that pilots had practiced all the cross-country flight elements within the recent past. Alternatively, a pilot might adopt a policy that a certain amount of flight time—five hours for example—regardless of mission or purpose, should have been flown within the previous 30 days.

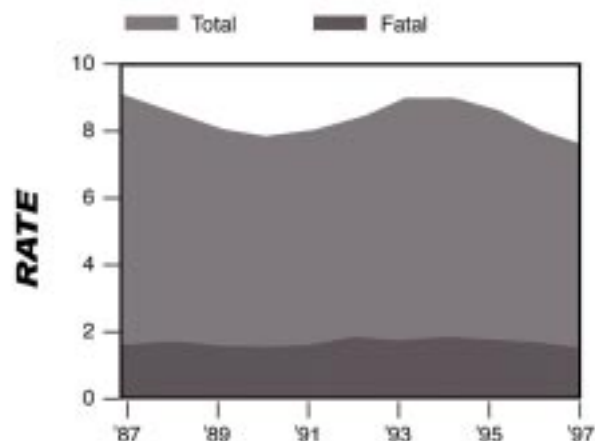
Weather/Light Conditions

(1997)



U.S. General Aviation Accidents

per 100,000 hours 1987-97



Volunteer Pilots

Similarly, an IFR cross-country flight of a specified length or duration could be desirable within the previous 30 or 60 days to ensure proficiency in working with the Air Traffic Control (ATC) system. The number of instrument approaches or other types of instrument flight procedures might also be increased.



Study your route of flight. Know the destination runway length and configuration, and have the approach book flagged to the most likely approach at the airport.

Experience

Pilots with 100 to 200 hours total pilot experience are involved in significantly more accidents than pilots with more than 200 hours total time. Therefore, pilots with less than 200 hours might consider refraining from conducting VPO missions as PIC and perhaps fly as co-pilots, instead. Minimum amounts of night or instrument time required by the FARs are exactly that—minimum. For certain operations, increases might be prudent.

Specific operational environments, such as mountain flying, short-field operations, and operations into busy terminal areas may call for specific types of flying experience. Wind, density altitude, route deviations, and unanticipated weather all play a part in both pilot and aircraft performance. Experienced pilots know that an aircraft does not perform to the ideal numbers cited in the Pilot Operating Handbook (POH), unless the pilot, aircraft, and conditions are also ideal.

Flight instructors and pilots with considerable experience flying in a part of the country or type of airfield in question can be consulted to help determine the need for additional proficiency or experience.

Training

The requisite flight review and occasional instrument proficiency checks may be the only training most general aviation pilots receive after certification. Professionals,

however, regularly undergo upgrade and refresher training. Airline pilots, doctors, lawyers, and other professionals are all required to train periodically on subjects old and new. VPO pilots can emulate the paid professionals even though they are volunteers. Training improves specific skills and heightens awareness of risk management. Training is inexpensive insurance that prevents accidents. A few hours of targeted training will bring confidence and proficiency. A syllabus can be useful to provide structure and track accomplishment. Simulation may be used where appropriate to sharpen basic IFR and multi-engine emergency skills.

Flight Considerations

Each VPO pilot should be aware of aircraft and personal limitations. Although adopting personal minimums need not be highly restrictive, they should be substantial enough to provide real direction. Personal minimums tend to “raise the bar” of performance, helping to ensure that quality service will be rendered.

Mission Qualifications

Brand-new private pilots with as few as 40 hours pilot time (35 hours under Part 141) are legally eligible to fly non-paying passengers virtually anywhere. But is it sensible for these relatively inexperienced pilots to conduct VPO missions? It may be prudent for a low-time pilot to abstain from acting as PIC for VPO missions until he or she has accrued more flight experience. However, there should be a place, such as co-piloting, for new pilots to be mentored by more experienced pilots and groomed for eventual service. As mentioned earlier, at least 200 hours or more may be a good starting point for minimum pilot experience flying volunteer missions. This level of experience also coincides

Cutting It Too Close

An experienced pilot with 2,100 hours in type boarded three passengers in his BE33 Debonair at Angel Fire, New Mexico (elevation 8,382 feet msl). Density altitude was approximately 11,582 feet msl. The aircraft was 30 pounds over maximum weight and carried partial fuel. During takeoff on Runway 17 (8,900 feet with a .6% uphill gradient), he rotated three times before the aircraft finally lifted off near the departure end. He flew low through the valley but finally crashed about 5 miles from the airport at an elevation of 8,813 feet. The NTSB report stated that performance charts indicated that the aircraft was capable of taking off under the prevailing conditions. The pilot later reported that turbulence and downdrafts degraded the climb performance.

with the FAR pilot hour requirement for commercial pilot certification. Enthusiastic newcomers should be encouraged to limit their operations accordingly, and if circumstances permit, should consider gaining valuable experience as observers or second pilots on VPO missions.

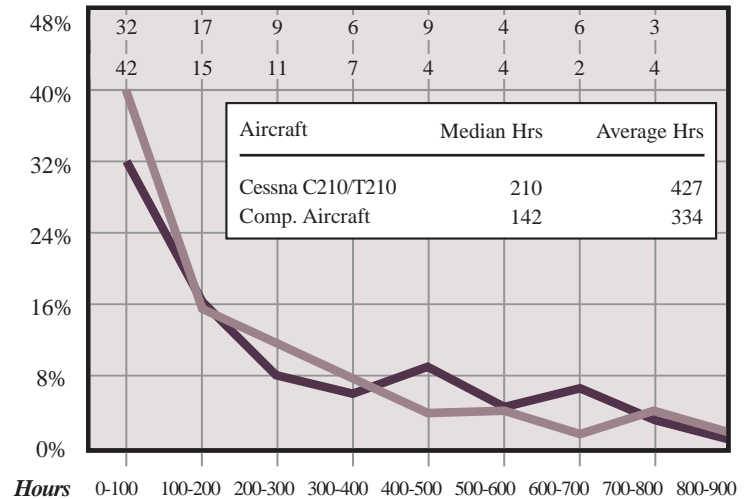
Safety analyses have shown that there is an inverse correlation between serious accidents and pilot time in aircraft type; therefore, it may be desirable for pilots operating new or different types of aircraft to set themselves a minimum of 30 hours in type before flying a VPO mission.

Special care should be taken when a pilot accepts night or instrument flights because accident rates are statistically higher for these types of operations. Personal minimums of at least 15 night hours and 25 instrument hours with 5 hours of flight in instrument meteorological conditions (IMC) after IFR certification are reasonable minimums for pilots operating in these conditions. In certain parts of the country, such as the Southwest, actual instrument time may be difficult to obtain. Local conditions will dictate what is prudent. The intent is for VPO pilots to have some actual weather experience before taking a trip in IMC with passengers.

Proficiency

The object of proficiency is to ensure a certain standard of performance. Although individuals may “self-certify,” flying with an objective evaluator, preferably a flight instructor, will enhance objectivity.

Pilot Time in Type: Serious Accidents



This graph of serious accidents in the Cessna 210 is representative of most types of aircraft and shows that the majority of serious accidents occur within the first 200 hours of time in type.

The FAA imposes currency requirements to ensure minimum safe piloting standards. However, pilots striving to provide a higher quality of service may set higher personal minimums and seek more frequent currency checks. See the following “Pilot Qualifications and Currency” table for recommendations for developing personal minimums.

Pilot Qualifications and Currency

The following pilot qualifications and currency are recommended by the AOPA Air Safety Foundation as personal minimums for volunteer pilots:

	Experience	Currency
General	<ul style="list-style-type: none"> • 200 hours PIC • 30 hours PIC in type 	<ul style="list-style-type: none"> • One cross-country flight within previous 60 days (preferably outside the local area) • Annual flight review conducted by CFI • <i>Single-engine fixed-gear</i>: 3 hrs. in any type in past 3 months • <i>Single-engine retractable gear</i>: 3 hrs. in retractable-gear aircraft in past 3 months • <i>Multiengine</i>: 3 hrs. in type in past 3 months
Day VFR	Same as above	3 hours of flight time as PIC and one landing within previous 30 days
Day IFR	25 instrument hours as PIC with 5 hours actual IMC	One IFR cross country within previous 30 days
Night VFR*	15 night hours as PIC	One night hour and one night landing as PIC within previous 30 days
Night IFR*	15 night instrument hours as PIC	One night instrument hour and instrument approach within previous 30 days
Special Mission (mountain, short-field, etc.)	Appropriate training and/or experience	Similar operation within previous 60 days

* Nighttime recommendations are added to VFR or IFR daytime recommendations, respectively.

Weather

Visual Meteorological Conditions (VMC)

Basic weather minimums are described in FAR Part 91, Subpart B. Again, these are minimum safe operating values and not always suited to real-world operations. For instance, even though the local Class D airport is reporting a ceiling and visibility of 1,000 feet and 3 miles, extended VFR cross-country flight under these conditions would be difficult to perform legally or safely due to minimum altitude and cloud clearance requirements. Therefore, 2,000 feet and 5 or more miles make better recommended ceiling and visibility minimums for VFR flights. This concept should go beyond current weather and include forecasts as well, e.g., the route and destination should be forecast to be at least 2,000/5 for the duration of the flight plus one hour. The recommended minimum enroute altitude over flat terrain is 1,500 feet agl. Obviously, proximity to obstacles, rough terrain, or congested areas will dictate a higher altitude.

Other weather elements should be considered when setting personal minimums, too. Adverse wind conditions account for a large number of loss-of-control accidents during takeoff and landing. Therefore, it may be prudent to limit operations to steady or gusting winds that do not exceed 50 percent of the power-off stalling speed of the aircraft to be flown, regardless of wind direction. For example, an airplane that stalls at 50 knots would be limited to 25 knots of wind. Crosswind components may be limited to 75 percent of maximum demonstrated capability. Exceptions may be appropriate for experienced pilots who routinely fly in locations that have high wind conditions.

Turbulence definitely affects the ability to enjoy and appreciate a flight. Sick or frightened passengers can increase the pilot's anxiety levels, as well. Sustained moderate or

greater levels of turbulence along the route of flight should be cause for postponing the trip. Light turbulence is often incorrectly reported as moderate. Remember that the definition of moderate turbulence means that unsecured items will move in the cabin and definite strains are felt against seatbelts. There will usually be variations in indicated airspeed. This is guaranteed to be an uncomfortable flight.

Instrument Meteorological Conditions (IMC)



High ceilings and plenty of visibility contribute to the safety of any flight.

An instrument rating and minimum currency requirements theoretically enable any pilot to fly in weather up to the limits specified by the aircraft operating limitations and FAR Part 97 (instrument approach and departure procedures). However, prudence dictates a more conservative approach.

Widespread moderate or greater turbulence, known or forecast moderate or higher levels of icing, freezing rain, thunderstorms in the immediate vicinity of the airport, and fog may be reasons to delay or cancel a flight. Consider the following:

Aircraft: If flight in IMC conditions is anticipated, an aircraft with at least a functioning single-axis autopilot and a backup power system for gyroscopic attitude and heading instruments can be advantageous. A handheld transceiver is highly recommended.

Takeoff: Consider takeoff weather minimums that meet or exceed the values specified for the airport's instrument departure procedure or the lowest landing minimums appropriate for the aircraft at the departure airport, whichever is greater.

Enroute: Designate a suitable airport with applicable landing minimums forecast for the duration of the flight and within 100 nm of the route of flight in case a diversion is required.



Volunteer pilots from different organizations joined forces to fly this young man and his mother in several linked flight segments from Wisconsin to Pennsylvania for treatment of a brain tumor.

Destination: An instrument approach landing minimum of 400 feet and visibility of 1 statute mile or published minimums plus 200/½, whichever is greater, should be considered. For example, if landing minimums are 350 feet and 1 mile, personal minimums of 550 feet and 1.5 miles might be used. Further, an instrument approach should not be initiated unless the reported weather conditions are at, or above, landing minimums for that approach.

Winds

Steady-state winds or wind gusts at the departure or arrival point exceeding 75 percent of the demonstrated crosswind limit of the aircraft or in excess of 50 percent of the aircraft stalling speed may be cause to postpone the flight or make alternate plans. For instance, an aircraft with a maximum demonstrated crosswind limit of 18 knots and a stall speed of 50 knots should not take off or land in more than 13.5 knots of direct crosswind, or more than 25 knots of wind from any direction.

Severe Weather

Avoid operations within 20 miles of thunderstorms, in sustained moderate or greater turbulence, or in freezing rain.

Night (See pie charts)

The AOPA Air Safety Foundation published a Safety Review, General Aviation Weather Accidents, which analyzed 5,800 weather accidents. Nighttime creates a special category of accident statistics, regardless of whether the flight is conducted under VFR or IFR.

- The night VMC fatal accident rate for 409 weather-related accidents occurring between 1982 and 1993 was 45 percent, more than three times higher than the day VMC fatal weather-related accident rate of 13 percent.
- These accidents tend to occur in the winter months, when days are shorter.
- The leading cause of these accidents was attempting to fly VFR into deteriorating weather at night.
- An instrument rating significantly improves the safety record at night. The number of non-instrument-rated pilots involved in night accidents is double that of instrument-rated pilots.

Therefore, special precautions, in addition to the daytime recommendations listed above that exceed FAA requirements, are prudent when planning a nighttime mission.

Night and IMC combine to form the deadliest mixture of accident probability.

- Of 592 night IMC weather accidents occurring from 1982 to 1993, 68 percent were fatal.
- Fixed-gear singles, retractable singles, and multiengine airplanes were almost equally represented.
- The leading causes were:
 - Attempting VFR flight into deteriorating weather at night (weather at the time of the accident was IMC), and
 - Descending below approach minimums.

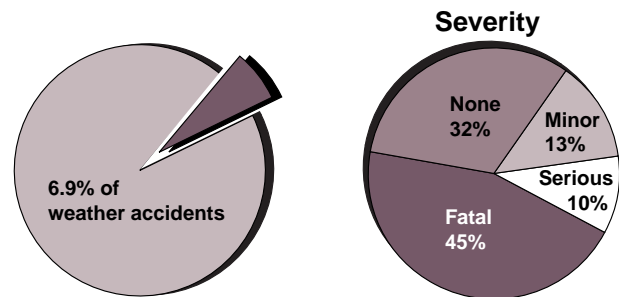
- Sixty-two percent of the pilots had instrument ratings, but only 49 percent of the flights were flown IFR.
- Forty-nine percent of the pilots had more than 1,000 hours total time.

We recommend that pilots adopt personal minimums similar to these below:

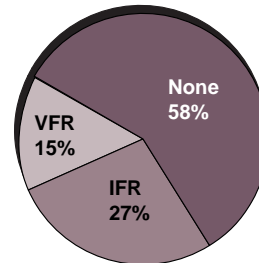
Night VMC Flight Recommendations

Weather: For flight within 50 nm of the departure airport, forecast minimum ceiling and visibility for the route of flight should be not less than 2,000 feet and 5 miles during the period of the flight and for at least one hour afterward.

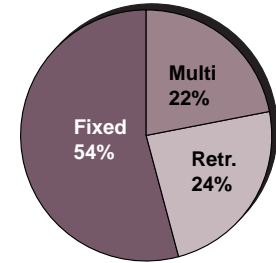
Night VMC Weather Accidents



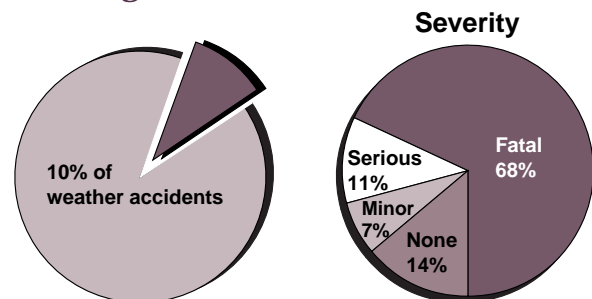
Flight Plan



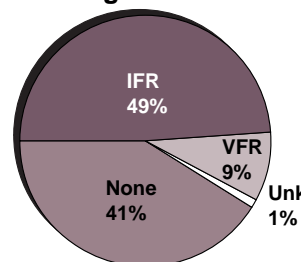
Aircraft Type



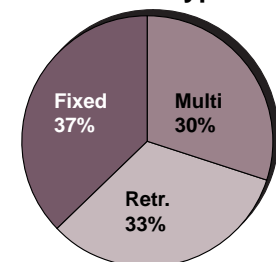
Night IMC Weather Accidents



Flight Plan



Aircraft Type



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Flights greater than 50 nm from the departure airport may benefit if conducted under IFR.

Pilot: Pilots who are instrument-rated and current and have accumulated a minimum of 15 night hours as PIC, with at least one hour of night time and one night landing logged within the 30 days preceding the planned flight may be better prepared for night VMC.

Night IMC Flight Recommendations

Weather: Same as day: An instrument approach landing minimum of 400 feet and visibility of 1 statute mile or published appropriate minimums plus 200/ $\frac{1}{2}$, whichever is greater. Further, instrument approaches initiated when the reported weather conditions are below landing minimums for the instrument approach to be used may be hazardous.

Pilot: Pilots who have accumulated 10 to 15 night hours as PIC under IFR, with at least one hour of IFR night time and one night IFR approach logged within the 30 days preceding the planned flight may be considered minimally qualified. This is in addition to the day IFR recommendations of 25 IFR hours PIC with 5 hours actual IMC after instrument certification.

Operations: Night circling approaches are not recommended when the ceiling and visibility are below 1,000 feet and 3 miles.

Duty Time

The term “duty time” comes from the FARs, which specify how much time a professional pilot can be in a condition of readiness to fly, regardless of whether he/she flies during the specified period. The concept recognizes the fact that being

VFR into IMC:

A 600-hour, instrument-rated commercial pilot launched on an air taxi flight to transport two passengers. The pilot had recently been hired, and this was only his second flight as PIC with this company. He was to fly on a VFR flight plan in VFR conditions only. The pilot was concerned about the weather and had checked it 12 times before launching VFR from Winston-Salem, North Carolina to Knoxville, Tennessee. Two of the 12 weather briefings said VFR flight was not recommended. Witnesses observed the airplane flying low, at about 200 feet agl, well below the mountains ahead. Fog obscured the higher elevations. His reluctance to turn back when he saw that weather conditions were not as forecast ended in disaster. The airplane crashed into the side of the mountain and burned.

on duty will eventually create an unacceptable level of fatigue. Fatigue is a subtle, but critical, factor in the accident equation. It dulls judgment, slows reflexes, and leaves no physical trace after a mishap that it was present.

Airline and charter pilots live under strict and complicated duty time limits. Private pilots should realize that fatigue can affect them, as well. An important aspect of duty time is rest time, or the time when pilots can actually relax.

Listed below are suggestions for personal minimums:

- Total day: 16 hours (waking hours)
- Business/personal activities and flying duties: 12 hours
- Maximum flying per day: eight hours (all flight-related activities, preflight to tiedown) and flights planned to arrive at the final destination no later than 10 p.m. unless the pilot is used to flying at these times or has had supplemental rest during the day.
- Rest time: 10 hours (between duty periods)

Flight Following

Because IFR flights are in constant communication with air traffic control during the entire flight, no other action need be taken to ensure tracking of the aircraft. However, for VFR flights, a VFR flight plan is recommended to be filed and activated for the duration of the flight, and when available, radar flight following services are also recommended.

General Considerations

Additional personal minimums to be considered for aircraft operations include:

- Airports to be used should have at least 50 percent more landing and takeoff runway available than required by airplane performance charts.
- Airports with hard-surfaced landing areas are preferred. Exceptions may be considered based upon need and experience.
- An aircraft operating checklist is recommended to be available and used for all flight operations.
- Aircraft are recommended to maintain a reserve fuel sufficient for one hour's flight at normal cruising speed fuel consumption. This may be increased for inclement weather or isolated airports.

Good Piloting Practices

The airlines and military services find that standard operating procedures (SOPs) create safer operations. Any pilot can develop routine practices for all phases of flight, from preflight through post-flight. Occasional deviations from these routines are inevitable but it makes sense to keep these to a minimum. If deviations from routine practice persist,

then they are no longer valid and should be revised to reflect the reality of the routine operations.

Many aircraft-related procedures are found in the Pilots Operating Handbook. These manuals provide detailed recommended procedures and techniques for specific aircraft. Aircraft-specific training manuals provided by training vendors are also a good source of information. Sources should be used in their entirety or modified in writing to emphasize the importance of having a comprehensive set of personal written procedures.

Note: The suggestions listed here were compiled by the Air Safety Foundation from a variety of sources, including air carriers, corporate flight departments, and training organizations.



A thorough preflight includes a lot more than a walk-around inspection of the airplane. Weather briefings, route planning, and fuel calculations are also essential for safe operations.

Preflight Preparation

Plan to allow at least **30 minutes** prior to departure for preflight planning. During this time, pilots can:

- Study and organize the appropriate charts and books for the flight.
- Obtain a full weather and notam briefing, either from a computerized briefing service or a flight service station.
- Prepare a flight log, listing all locations/waypoints that define the route of flight, enroute time, and total fuel required. A computer-generated plan is acceptable.
- Identify suitable alternates and compute fuel reserve.
- Compute aircraft weight and balance for the load to be carried.
- Compute takeoff and climb data.
- Compute accelerate-stop, accelerate-go, V_x , V_y . Add 50% to distance numbers.
- Compute landing data for destination and alternates. Add 50% to distance numbers.
- File a flight plan for all flights, except local flights (less than 50 nm).
- Review the airworthiness status of the aircraft.
- Ensure that the proper amount of fuel is on board the aircraft – 1 hour reserve, minimum.
- Complete a walk-around inspection of the aircraft as described in the pilot's operating handbook.
- Brief the passengers. Include the following items:
 - The duration of flight and expected weather conditions enroute;
 - Smoking policy;
 - Use of safety belts and shoulder harnesses;
 - Location and operation of normal and emergency exits;
 - Location and use of safety and survival equipment; and
 - Use of normal and emergency oxygen equipment.
 - Location of air sickness bags.

Engine Start and Taxi

- Have passengers on board and briefed with seat belts fastened prior to engine start.
- Get airport traffic information service (ATIS), ATC clearance, and taxi instructions prior to taxi.
- Use care when running checklists—distraction is a leading cause of runway incursions.
- Configure navigation equipment for departure and initial segment prior to takeoff.
- Ensure that all charts and information pertinent and appropriate to the flight are organized and available.

Takeoff

- Ensure that the chosen/assigned runway is suitable regarding length, width, and surface. Note any climb-out limitations regarding required climb gradient or obstructions prior to departure.
- Conduct a takeoff briefing or self-briefing, to include:
 - Speeds, power settings, aircraft limitations, and special conditions;
 - Communications and navigational frequencies for normal departure and emergency return;
 - Departure procedures;
 - Initial assigned/chosen altitude; and
 - Emergency/contingency procedures.
- Use appropriate lighting to enhance aircraft visibility.

Climb

Engage the autopilot only after reaching 500 feet agl or twice the altitude loss associated with autopilot failure as specified in the POH, whichever is higher.

- Maintain a constant lookout for other aircraft.
- Note/call out assigned altitudes 1,000 feet prior to reaching each assigned altitude; use an altitude alerter if installed.

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Cruise

- Recompute the fuel required to reach the destination at least hourly.
- Obtain an updated destination weather forecast hourly.
- Cross-check navigational accuracy by all available means.
- Cross-check and note engine instruments and fuel gauges at least every quarter hour.
- Oxygen use: For pilots and passengers when above 11,000 feet agl for more than 30 minutes, and at night for pilots when above 5,000 feet agl for more than 30 minutes.

Descent/Approach

- Plan/conduct descents to maintain a rate of descent not greater than 1,000 feet per minute; 500 fpm is preferable in unpressurized aircraft.
- Note/call out assigned altitudes 1,000 feet prior to reaching each assigned altitude; use an altitude alerter, if installed.
- Conduct an approach briefing, to include:
 - Destination airport features, including approach and runway to be used and lighting to be anticipated;
 - Destination weather;
 - Nav aids setup; and
 - Field elevation.

VFR

- Approved/recommended pattern entry procedure and altitude; and
- CTAF frequencies and self-announce points.

IFR

- Initial approach altitude;
- Final approach course;
- Missed approach point (MAP)/timing, if required;
- DH/MDA; and
- Missed approach procedure.
- Use aircraft lights for conspicuity.

Mountain Accident Snapshot

A 1,300-hour private pilot with 1,200 hours in a Cessna 210 took off with four passengers from South Lake Tahoe, California. The wind direction on this February day was 170 at 15 knots. The field elevation was 6,264. The pilot took off with a tailwind from Runway 36, which was 8,500 feet long and wet. The aircraft rotated about 3,000 feet down the runway, then climbed to about 50 feet agl. The pilot elected to abort the takeoff because the aircraft was not climbing well. The touchdown was made with 2,000 feet of runway remaining, but the pilot was unable to stop in the remaining distance. The aircraft went off the end of the runway and struck a snowbank, causing substantial aircraft damage but, fortunately, no injuries. This pilot made a good decision to reject the takeoff.

- Maintain continuous lookout for other aircraft.
- Cross-check instruments for attitude and position. Note warning flags or lights.
- Note/call out the following during approach:



Two children from Springfield, Illinois, prepare for their trip to Knoxville, Kentucky, for leukemia treatment.

VFR

- Position of aircraft in the traffic pattern; and
- Surface wind direction/velocity.

IFR

- Localizer/final approach course capture;
- 500 and 100 feet above DH/MDA;
- DH/MDA;
- Runway in sight/no contact; and
- Landing/go-around decision.
- Stabilize approach at least 1,000 feet above DH/MDA (aircraft in landing configuration and rate of descent stabilized).
- Maintain approach deviation from course/glideslope within 2 dots deflection and 1.3 V_{so} plus 10 knots (minimum) during an instrument approach.
- Place aircraft in landing configuration not later than the final approach fix during an instrument approach or prior to reaching 500 feet agl on visual approaches.
- Complete landing checklist prior to reaching 500 feet above the runway.

Landing

- Maintain 1.3 V_{so} (adjusted for condition correction factors to -5 and +10 knot limitations until over the runway threshold).
- Leave configuration of aircraft unaltered until after clearing the runway, unless required by the POH.

Post-flight

- Conduct brief post-flight inspection to determine aircraft's airworthiness.

A periodic review of one's personal minimums helps to ensure their validity and conformance with other procedures and limitations for specific aircraft operations.

Flight Checklist

Planning

- Passengers questioned for possible flight limitations;
- Aircraft airworthy and capable of the assigned flight;
- Route examined for hazards and obstacles; and
- Pilot qualified and current.

Preflight

- Pilot in good health and well rested;
- Current and forecast weather adequate;
- Current charts in the aircraft;
- Weight and balance completed;
- Aircraft takeoff, climb, cruise, and landing performance computed;
- Flight plan filed; and
- Aircraft preflight inspection completed.

Departure

- Passengers briefed; and
- Flight plan activated.

Enroute

- Flight following used if available for VFR;
- Enroute and destination weather monitored hourly; and
- Fuel remaining computed regularly.

Arrival

- Passengers safely escorted off the ramp; and
- Flight plan closed.

Sterile Cockpit

The work load is highest, and concentration is of utmost importance on the ground, at the airport, within 10 miles of arrival or departure, and when dealing with a change in the weather or in your route. Midair and ground collision potential is at its highest and many aircraft configuration changes are needed in a short time. A procedure that is used by many professional pilots and flight operations is the sterile cockpit. When the work load is high, distractions can and do result in accidents. The idea is to make the cockpit "sterile of distraction." Many volunteer pilots fly with a second volunteer who takes care of all patient inquiries and most of the non-flying duties associated with the mission. Explain to your passengers that you will be very busy at certain times. For safety's sake, conversations and actions should be limited to the immediate flight operation. Although they should not hesitate to point out traffic or something they feel is important, it is not the time to be discussing the stock market, your vacation plans, etc. If your cockpit intercom has a crew isolation feature, this might be a good time to use it.

Aircraft

Suitability

Aircraft to be used for VPO operations normally do not need special features to accommodate their passengers. An aircraft with a sufficient number of seats, some baggage capacity, and adequate payload/range capability are normally the only requirements for a basic mission. However, the operating environment—terrain, weather, and time of day—also play an important role in determining suitability.

AOPA Air Safety Foundation Recommendations for Enhanced Ceiling and Visibility Minimums

(expressed in feet/statute miles.)***

	Day VFR	Day IFR	Night VFR	Night IFR
Departure	2,000/5	Approach* minimums	2,000/5	Approach minimums
Enroute	2,000/5**	Above minimums approach available within 100 nm	2,000/5	Same as day IFR
Arrival	2,000/5**	400/1 or lowest minimums applicable plus 200 ^{1/2}	2,000/5	Same as day IFR. Circling approaches not recommended.

Notes:

*Minimums based on a fully operational approach capable of being executed by the pilot/aircraft combination.

**Forecast based on 2,000/5 for the enroute portion plus one hour.

***When flying in mountains, recommended minimums are 5,000/10 for all phases of flight.



Brief your passengers before engine start.

If the flight is to be conducted over mountain, deserts, or water, special considerations are appropriate.

Operating in mountainous or high terrain may involve using an aircraft at or near its service ceiling, leaving little performance margin available. Similarly, high terrain may either mandate or suggest the use of oxygen or pressurization for pilot and passengers. Specific piloting skills may be desirable for flight in these areas, too.

It is recommended that flight over desert areas be attempted only after considering operational alternatives; if a detour of 50 or 100 miles would obviate the need for flying over hostile terrain, this may be preferable to accepting the risk of a more direct route. If flight over the desert is chosen, or unavoidable, a survival kit should be carried.

Similarly, evaluate flights over water outside gliding distance of land for risk. Within the continental United States, routes over water may be detoured over land for increased safety. Flotation equipment can be carried to provide an extra margin of safety if detours are not possible.

Airworthiness

The owner/operator is responsible for maintaining an aircraft in airworthy condition. More specifically, the pilot in command is responsible for determining whether an aircraft is in condition for safe flight. Many pilots interpret this to mean merely preflighting the aircraft. However, the concept of airworthiness goes further than just a preflight.

For most light aircraft not used for compensation or hire, airworthiness consists of the following elements:

- Inspected in accordance with Subpart E of FAR Part 91, normally an annual inspection;
- All airworthiness directives complied with;
- All installed equipment must be operative;*
- The aircraft conforms to the FAA-approved type design;**
- Transponder tested within the preceding 24 months; and
- If IFR flight is contemplated, an altimeter-static system inspection within the preceding 24 months.

* See FAR Part 91.213(d).

**This essentially means that the aircraft is configured in the same manner as the day it received its certificate of airworthiness, unless authorized modifications are substantiated by supplementary type certificates.

Most of these elements normally are left to the owner's or fixed base operator's (FBO) mechanic to ensure compliance. However, the responsibility for an airworthy aircraft still rests with the owner/operator.

Snapshot Summary

Pilots are encouraged to use the following suggested checklist as a guide in preparing their own checklist to take in their flightbag and use on their missions. The final checklist may vary substantially taking into account an individual pilot's qualifications and the capabilities on the aircraft to be used.

Pilot Recommendations

Experience:

- 200 hours PIC
- 30 hours PIC in type



This pilot flew this child and her mother from Springfield Illinois, to Knoxville, Kentucky, for a leukemia treatment.

Currency:

- One cross-country within previous 60 days
- Annual flight review

Duty Time

- 8 hours flying/day
- Arrive at destination no later than 10 p.m.
- Rest 10 hours before flying again

Weather Recommendations

Day VFR

- 3 hours PIC within 30 days
- One landing within 30 days
- 2,000-foot ceiling/5 miles visibility (higher in mountainous terrain)
- File VFR flight plan if trip exceeds 50 miles
- Use radar flight following if available

Day IFR

- 25 instrument hours with 5 hours actual IMC as PIC after instrument certification
- One IFR cross-country within 30 days
- 400/1 or lowest minimums plus 200 $\frac{1}{2}$

Night VFR

- 15 night hours PIC
- One night hour and one night landing within 30 days
- 2,000-foot ceiling/5 miles visibility (higher in mountainous terrain)
- File VFR flight plan/short trip
- File IFR for more than 50-mile trip

Night IFR

- 10 night instrument hours PIC in addition to day IFR recommendation
- Similar operation within 60 days
- 400/1 or lowest minimums plus 200 $\frac{1}{2}$
- Circling approaches not recommended

Wind

- Limit: 75 percent of crosswind limit of aircraft and 50 percent of stall speed

Severe Weather

- Maintain a distance of at least 20 miles from thunderstorms
- No flight in sustained moderate or greater turbulence
- No flight in freezing rain
- Avoid flight in icing conditions unless aircraft is approved by type certificate.

Mountains

- 5,000-foot ceiling/10 miles visibility for all phases of flight

Operations Recommendations

Runway

- Hard surfaced and 50 percent longer than aircraft requires for takeoff and for landing at destination

Fuel

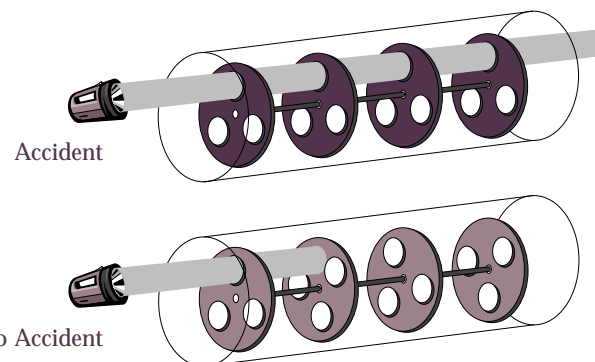
- One hour fuel reserve on landing; more for IMC

VFR Enroute Altitude

- Minimum 1,500 feet agl. Higher as needed for obstacles, terrain, and congested areas

Conclusion

An excellent pilot is not merely accident-free. Excellence is achieved by constantly striving to be better – not allowing oneself to become satisfied with one's own level of accomplishment or complacent about the need to maintain a high level of skill. The price of safety is constant vigilance. Think of it like this – imagine a flashlight shining into a tube. Within this tube are several wheels with holes in them that are turning at different rates. Most of the time, the light from the flashlight does not shine through all the holes in the wheels because they seldom line up. But, when they DO line up, the light passes through all the wheels and out the other end of the tube. The wheels are accident factors, and when the holes perfectly line up, the accident chain is complete. Accidents are the result of several factors that culminate in an unfortunate event. Some pilots fly with two or three “wheels” always lined up as part of a potential accident chain. But, pilots who incorporate these Air Safety Foundation recommendations into their flight plans can minimize the likelihood of allowing an accident chain to develop.



Volunteer pilot organizations and their volunteer pilots have provided volunteer services to thousands of non-critically ill people for more than 20 years with an excellent safety record. By following these safety recommendations, that excellent safety record can continue. If you are interested in joining one of the many volunteer pilot organization's volunteer groups, contact Air Care Alliance at 1-888-662-6794 or visit their website at www.aircareall.org.

MORE *Safety Advisors* for VFR and IFR Pilots

For information about AOPA Air Safety Foundation safety materials or seminars, call us at 1-800-638-3101, e-mail us at asf@aopa.org, or visit our Web site at www.aopa.org/asf.

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