

Your Safety Reserve

Developing Your Personal Minimums

Susan Parson

In formal terms, personal minimums refer to an individual pilot's set of procedures, rules, criteria, and guidelines for deciding whether and under what conditions to operate (or continue operating) in the National Airspace System. While this definition is accurate, it tends to describe the product rather than explain the process. Also, the formal definition does not really convey one of the core concepts: personal minimums as a "safety buffer" between the demands of the situation and the extent of your skills.

I like to think of personal minimums as the human factors equivalent of reserve fuel, which is intended to provide a safety buffer between fuel required for normal flight and the fuel available. In the same way, personal minimums should be set so as to provide a solid safety buffer between the pilot skills and aircraft capability *required* for the specific flight you want to make, and the pilot skills and aircraft capability *available* to you through training, experience, currency, proficiency and, in the case of the airplane, performance characteristics. Just as in making fuel calculations, you shouldn't consider making a flight that requires use of skills at the "reserve" or worse, "unusable fuel" level of your pilot-skill and aircraft capability.

Here's one systematic approach to developing your own personal minimums.

Step 1 – Review Weather Minimums. The regulations define weather flight conditions for visual flight rules (VFR) and instrument flight rules (IFR) in terms of specific values for ceiling and visibility. IFR means a ceiling less than 1,000 feet AGL and/or visibility less than three miles. Low IFR (LIFR) is a sub-category of IFR. VFR means a ceiling greater than 3,000 feet AGL and visibility greater than five miles. Marginal VFR (MVFR) is a sub-category of VFR.

Step 2 – Assess Your Experience and Comfort Level. Think through your recent flying experiences and make a note of the lowest weather conditions that you have comfortably experienced in VFR and, if applicable, IFR flying in the last six to twelve months. This exercise helps establish your personal "comfort level" for VFR, MVFR, IFR, and LIFR weather conditions.

Step 3 – Consider Other Conditions. It is also a good idea to have personal minimums for wind, turbulence, and operating conditions that involve things like high density altitude, challenging terrain, or short runways. Record the most challenging conditions you have comfortably experienced in the last six to twelve months.

You can note these values for category and class, for specific make and model, or both.

Step 4 – Assemble and Evaluate. Next, combine these numbers to develop a set of baseline personal minimums.

Step 5 – Adjust for Specific Conditions. Any flight involves almost infinite combinations of pilot skill, experience, condition, and proficiency; aircraft equipment and performance; environmental conditions; and external influences. These factors can compress the baseline safety buffer, so you need a structured way to adjust for changing conditions. Consider developing a chart of adjustment factors based on changes in the PAVE checklist factors - Pilot, Aircraft, enVironment, and External Pressures.

When you have comfortably flown to your baseline personal minimums for several months, you can consider adjusting to lower values. Two important cautions:

- Never adjust personal minimums to a lower value for a specific flight. The time to consider changes is when you are not under any pressure to fly, and when you have the time and objectivity to think honestly about your skill, performance, and comfort level.
- Keep all other variables constant. If your goal is to lower your baseline personal minimums for visibility, don't try to lower the ceiling, wind, or other values at the same time.

Step 6 – Stick to the Plan! Once you have established baseline personal minimums, "all" you need to do next is stick to the plan. That task is a lot harder than it sounds, especially when the flight is for a trip that you really want to make, or when you are staring into the faces of disappointed passengers. Here's where personal minimums can be an especially valuable tool. Professional pilots live by the numbers, and so should you. Pre-established numbers can make it a lot easier to make a smart no-go or divert decision. In addition, a written set of personal minimums can also make it easier to explain tough decisions to passengers who are entrusting their lives to your aeronautical skill and judgment.

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Step 4: Assemble and evaluate baseline personal minimums.

Baseline Personal Minimums				
Weather Condition	VFR	MVFR	IFR	LIFR
Ceiling	Day			
	Night			
Visibility	Day			
	Night			
Turbulence	SE	ME	Make/Model	
	Surface			
	Wind Speed			
	Surface			
Wind Gust				
	Crosswind Component			
Performance	SE	ME	Make/Model	
	Shortest runway			
	Highest terrain			
	Highest density altitude			

Step 5: Adjust for specific conditions.

	If you are facing:	Adjust baseline personal minimums to:
Pilot	Illness, medication, stress, or fatigue; lack of currency (e.g., haven't flown for several weeks)	At least 500 feet to ceiling
Aircraft	An unfamiliar airplane, or an aircraft with unfamiliar avionics/ equipment:	At least 1/2 mile to visibility
enVironment	Airports and airspace with different terrain or unfamiliar characteristics	At least 500 ft to runway length
External Pressures	"Must meet" deadlines, passenger pressures; etc.	At least 5 knots from winds



Federal Aviation Administration

Developing Personal Minimums

Think of personal minimums as the human factors equivalent of reserve fuel. Personal minimums should provide a solid safety buffer between:

- Skills required for the specific flight, and
- Skills available to you through your training, experience, currency, and proficiency.

Step 1 – Review Weather Minimums

Step 2 – Assess Weather Experience and Personal Comfort Level

Step 3 – Consider Winds and Performance

Step 4 – Assemble Baseline Values

Step 5 – Adjust for Specific Conditions

Step 6 – Stick to the Plan!

FOLD

Step 1: Review definitions for VFR & IFR weather minimums.

Category	Ceiling		Visibility
VFR	greater than 3,000 AGL	and	greater than 5 miles
MVFR	1,000 to 3,000 AGL	and/or	3 to 5 miles
IFR	500 to 999 AGL	and/or	1 mile to less than 3 miles
LIFR	below 500 AGL	and/or	less than 1 mile

Step 2(a): Record certification, training, & recent experience.

CERTIFICATION LEVEL	
Certificate level (e.g., private, commercial, ATP)	
Rating(s) (e.g., instrument, multiengine)	
Endorsements (e.g., complex, HP, high altitude)	
TRAINING SUMMARY	
Flight review (e.g., certificate, rating, Wings)	
Instrument Proficiency Check	
Time since checkout in airplane 1	
Time since checkout in airplane 2	
EXPERIENCE	
Total flying time	
Years of flying experience	
RECENT EXPERIENCE (last 12 months)	
Hours	
Hours in this airplane (or identical model)	
Normal Landings	
Crosswind landings	
Night hours	
Night landings	
Hours flown in high density altitude	
Hours flown in mountainous terrain	
IFR hours	
IMC hours (actual conditions)	
Approaches (actual or simulated)	
Time with specific GPS navigator	
Time with specific autopilot	

Step 2(b): Enter values for weather experience/ "comfort level."

Experience & "Comfort Level" Assessment Combined VFR & IFR				
Weather Condition	VFR	MVFR	IFR	LIFR
Ceiling				
Day				
	Night			
Visibility	Day			
	Night			

Step 3(a): Enter values for experience / comfort in turbulence.

Experience & "Comfort Level" Assessment Wind & Turbulence			
	SE	ME	Make/ Model
Turbulence			
Surface wind speed			
Surface wind gusts			
Crosswind component			

Step 3(b): Enter values for performance.

Experience & "Comfort Level" Assessment Performance Factors			
	SE	ME	Make/ Model
Performance			
Shortest runway			
Highest terrain			
Highest density altitude			