SUSAN PARSON

All Hands on Deck!

Managing the Mission with a Crew of Just You

Like many GA pilots, I got very accustomed to being the sole pilot on board. Occasionally I flew with fellow pilots to maintain currency and proficiency, but most of my flying involved being alone in the airplane or serving as pilot *and* flight attendant to my non-aviator passengers. So I figured I was already pretty adept at "single pilot resource management" (SRM), a term that was just beginning to bubble into GA jargon.

Aviation never fails to deliver a powerful "not so fast" lesson anytime we pilots think we've got something nailed. My lesson in the real challenges of single-pilot operations came just after Thanksgiving about fifteen years ago. I had flown to coastal North Carolina to spend the holiday with family and, since the weather forecast for the return trip looked increasingly grim, I moved up my departure time by several hours.

I was in instrument meteorological conditions (IMC) shortly after takeoff, but I figured I'd soon be on top. In fact, I was in the soup for the entire two hour flight. I was counting on the IFR (vice low IFR) forecast at my destination to hold. However, I could tell from monitoring ATIS and automated weather observation system broadcasts along the way that this system was not behaving as the forecasters had expected. Thus it was not a complete surprise to hear an aircraft ahead report missing the approach to my airport. I knew things were about to get very busy for me, starting with the controller's almost immediate request for me to "say intentions." There was no copilot or autopilot to help with basic flying tasks while I sorted through charts and options. There was no GPS, except for the tiny first-generation handheld I had recently acquired. I had never flown any of the approaches to Dulles, which quickly became my only viable option. I had never flown a holding pattern "for real," but I had just copied instructions for holding in no-kidding IMC.

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I was eventually cleared for the approach, which I flew with every bit of concentration and precision I could muster. I broke out of the clouds around 400 feet above ground level, and experienced that incredible sense of "there-it-is!" relief when I saw the brightly lit runway stretching out before me.

In the most basic terms, I passed the SRM test — I flew single-pilot, single-engine IFR in IMC and landed safely. In the broader sense, though, there was plenty of room for improvement.

SRM Defined

So what is single-pilot resource management? The FAA *Risk Management Handbook* (FAA-H-8083-2)

notes that SRM is defined as the art of managing all the resources (both onboard the aircraft and from outside sources) available to a pilot prior to and during flight to ensure a successful flight. It is about how to gather information, analyze it, and make decisions. It requires the pilot to competently perform a number of mental tasks in addition to the physical task of basic aircraft control. These include:

- Situational awareness
- Task management
- Automation management
- Risk management
- Aeronautical decision-making
- CFIT (controlled-flight-into-terrain) awareness

The *Risk Management Handbook* also offers an observation that became very real to me on my flight that day:

> *Learning how to identify problems, analyze the information, and make informed and timely decisions is not as straightforward as the training involved in learning specific maneuvers. Learning how to judge a situation and "how to think" in the endless variety of situations encountered while flying out in the "real world" is more difficult. There is no one right answer in ADM; rather each pilot is expected to analyze each situation in light of experience level, personal minimums, and current physical and mental readiness level, and make his or her own decision.*

That is no small challenge, especially for GA pilots whose aeronautical experience may be limited. In the case of my flight, the strong instrument maneuvers and procedures training I had received provided the solid foundation necessary for task management and situational awareness, especially in an airplane with no automation (thus no need for automation management). What I most clearly lacked was a practical framework for risk management and aeronautical decision-making.

SRM in Action

The incorporation of SRM into GA pilot training curricula is an important step forward in aviation safety. A structured approach to SRM helps pilots learn to gather information, analyze it, and make decisions on the conduct of the flight.

When it comes to gathering information, SRM training emphasizes that even though the flight is operated by an individual pilot and not an onboard crew, the pilot has a number of inside and outside resources available to assist with the flight. A key skill is to identify and effectively use these resources for the safe conduct of the flight.

For example, internal resources might include passengers, even if they have no flying experience. The pilot can ask passengers to assist by reading checklist items and watching for traffic. Passengers can also help listen for air traffic control (ATC) radio calls and the pilot can also teach the right seat passenger to assist with functions such as switching radio frequencies. It could also be helpful to teach frequent passengers some basic programming skills for moving map and multifunction displays, if the aircraft is so equipped. Internal resources might also include the pilot's use of verbal briefings. Many solo pilots read the checklist — an essential internal resource! — out loud, and make it a point to touch the appropriate switch or control.

Your onboard equipment, which can include both panel-mounted and hand-held devices, constitutes another important internal resource. Today's technology offers an incredible range of information to assist with overall situational awareness, navigation, weather information, and much more. The key to benefiting from this resource is to know your devices: long before you leave the ground, know what information is available and make sure you know how to access it without unduly diverting your attention from essential aircraft control duties.

External resources include ATC and Flight Service (AFSS). ATC can assist with traffic advisories,

radar vectors, flight following, and assistance in emergency situations. A pilot with a problem can request assistance from ATC. Services provided by ATC can not only decrease pilot workload, but also help pilots make informed inflight decisions. Flight Service and Flight Watch can assist with inflight weather information.

Fellow pilots are another potential external resource. These include air carrier crews, flight instructors, corporate flight crews, or any other pilot in your vicinity. Aviators on or near your route of flight can often provide the most useful real-time information about weather and general flight conditions.

To get the greatest benefit from SRM, you also need a practical framework for application in day-to-day flying. As outlined in the *Risk Management Handbook*, one such approach involves regular evaluation of:

- Plan
- Plane
- Pilot
- Passengers
- Programming

The point of the 5P approach is not to memorize yet another aviation acronym. You might simply write these words on your kneeboard, or add a reference to 5Ps to your checklist for key decision points during the flight. These include preflight, pre-takeoff, cruise, pre-descent, and just prior to the final approach fix or, for VFR operations, just prior to entering the traffic pattern.

Items to consider in association with the 5Ps might include the following.

Plan: The plan includes the basic elements of cross-country planning: weather, route, fuel, current publications, etc. The plan also includes all the events that surround the flight and allow the pilot to accomplish the mission. The pilot should review and update the plan at regular intervals in the flight, bearing in mind that any of the factors in the original plan can change at any time.

Plane: The plane includes the airframe, systems, and equipment, including avionics. The pilot should be proficient in the use of all installed equipment, as well as familiar with the aircraft/equipment's performance characteristics and limitations. As the flight proceeds, the pilot should monitor the aircraft's systems and instruments in order to detect any abnormal indications at the earliest opportunity.

Pilot: The pilot needs to pass the traditional "IMSAFE" checklist. This part of the 5P process helps a pilot identify and mitigate physiological hazards at all stages of the flight.

Passengers: The passengers can be a great help to the pilot by performing tasks such as those listed earlier. However, passenger needs — e.g., physiological discomfort, anxiety about the flight, or desire to reach the destination — can create potentially dangerous distractions. If the passenger is a pilot, it is also important to establish who is doing what. The 5P approach reminds the pilot-in-command to consider and account for these factors.

Programming: The programming can refer to both panel-mount and hand-held equipment. Today's electronic instrument displays, moving map navigators, and autopilots can reduce pilot workload and increase pilot situational awareness. However, the task of programming or operating both installed and handheld equipment (e.g., tablets) can create a serious distraction from other flight duties. This part of the 5P approach reminds the pilot to mitigate this risk by having a thorough understanding of the equipment long before takeoff, and by planning in advance when and where the programming for approaches, route changes, and airport information gathering should be accomplished, as well as times it should not be attempted.

A structured approach to SRM helps pilots learn to gather information, analyze it, and make decisions on the conduct of the flight.

Whatever SRM approach you choose, use it consistently and remember that solid SRM skills can significantly enhance the safety of "crew of you" flights.

Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

Learn More

FAA's Risk Management Handbook (FAA-H-8083-2), chapter 6
www.faa.gov/regulations_policies/handbooks_manuals/aviation/risk_management_handbook/

Advisory Circular 120-51E, *Crew Resource Management Training*
http://go.usa.gov/ZECw

"Whither and Whether of Flying in Weather" (*FAA Safety Briefing* – July/August 2010)
www.faa.gov/news/safety_briefing/2010/media/julaug2010.pdf