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MANAGING YOURSELF

Features

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Single-Pilot Crew Resource Management

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We are not alone. Don't worry, this isn't leading to yet another theory about the 1947 UFO incident at Roswell. But it does have something to do with flying objects. Even when flying over Roswell, New Mexico, all by yourself, you, the pilot in command, are not alone. To quote the wise aviator David L. Baker: "Flying is so many parts skill, so many parts planning, so many parts maintenance, and so many parts luck. The trick is to reduce the luck by increasing the others." Let's take a look at what those others can do for us, even when we think we're on our own in the cockpit.

Crew resource management (CRM), originally known as cockpit resource management, is a concept that has evolved as a response to the human factors issues involved in flying, specifi- cally in flying airliners. A National Transportation Safety Board (NTSB) study of airline accidents conducted in the 1970s found that many crashes could have been prevented if the crewmembers had done a better job of using all of the resources available to them, including each other.

The study culminated in a paper by John K. Lauber of the NASA-Ames Research Center titled *Cockpit Resource Management in Airline Flight Operations*. Lauber's paper was distributed to virtually all airlines as a source of information for use in their recurrent training ground schools. Lauber outlined seven principles of cockpit resource management. They are: 1) Appropriate delegation of tasks and assignment of responsibility; 2) Establishment of logical order of priorities; 3) Continuous monitoring and cross-checking of essential instruments and systems; 4) Careful assessment of problems and avoidance of preoccupation with minor ones; 5) Utilization of all available data to conduct an operation; 6) Clear communication among crewmembers of all plans and intentions; and 7) Assurance of sound leadership by the pilot in command.

These principles can easily be applied to single-pilot operations. If you are flying as a single pilot, then the rest of your crew is on the ground, standing by to assist in any way they can. All you have to do is communicate with and utilize these resources.

The FAA practical test standards (PTS) for the private pilot exam require that checkride applicants have an understanding of CRM based on Advisory Circular 120-51, *Crew Resource Management Training*. According to the private pilot PTS, CRM "refers to the effective use of *all* available resources; human resources, hardware, and information." Human resources "...includes all other groups routinely working with the cockpit crew (or pilot) who are involved in decisions that are required to operate a flight safely. These groups include, but are not limited to: dispatchers, cabin crewmembers, maintenance personnel, and air traffic controllers." The PTS explains, "CRM is not a single task, it is a set of skill competencies that must be evident in all tasks in the PTS as applied to either single-pilot or crew operation." Essentially, private pilot applicants are expected to exhibit good single-pilot CRM skills throughout the practical test. Sometimes good CRM is just a matter of good common sense!

You can start using single-pilot CRM well before your flight becomes airborne. Sometimes we take for granted the myriad resources available to us, especially with so much information available instantaneously. Only 20 years ago, pilots called weather briefers and then had to mentally construct a picture of the weather from the briefer's description. Today, pilots can begin the briefing process by watching The Weather Channel, get a wide range of graphic weather depictions off the Internet from sources such as AOPA (www.aopa.org/members/wx), print out a Direct User Access Terminal System (DUATS) briefing (www.duats.com), and still get help with clarification and interpretation from a weather briefer. Put together, all of these weather sources help you to track developing weather and reinforce your understanding of what is happening in the air. Using them is part of CRM.

If you are renting an aircraft through your flight school or flying club, you might want to stop in and visit with the resident A (airframe and powerplant) mechanic charged with keeping your airplane airworthy. Ask about any recent squawks on the airplane and about any required inspections that may be due. The mechanic may turn out to be one of your ground-based resources should a mechanical problem arise that is difficult for you to troubleshoot or solve. This valuable person might be available to you through the FBO's unicom frequency even after you are in the air.

As you start your preflight inspection of the aircraft, several paper CRM items will come into play, including the airplane flight manual (AFM) or pilot's operating handbook (POH), navigation charts, checklist, and any other valuable printed matter such as the *Airport/Facility Directory*.

The most important of these is the checklist. Follow it carefully, to the letter, and in order. Many in-flight emergencies occur because the checklist was not adhered to in the first place. However, as a single-pilot operator, your use of the checklist must share cockpit time with proper scanning both inside and outside the airplane. Remember, fly the

Top 10 reasons to volunteer at an AOPA fly-in

airplane first.

Your airplane checklist will direct you to check all cockpit instruments. And each instrument, in turn, serves as a tool for your CRM. The transponder, for example, can assist you in an emergency by letting those on the ground know what's going on. (Squawk code 7700 for any emergency, 7600 for a communications failure.)

In addition to the tools that are integrated into the airplane itself, you can choose to add valuable items such as a handheld VHF radio transceiver to your CRM arsenal. In an emergency situation, you can work with the air traffic controller who is currently assisting you, or you can dial up 121.5 MHz and declare an emergency. Expect the controller to ask you about the nature of your problem and your intentions. The voice you hear on the radio is ready to assist you in any way possible as part of your CRM team.

Another resource may be your fellow aviators sharing your airspace. These include airline crews, cargo crews, flight instructors, corporate flight crews, or any other pilot in your vicinity. One of the best sources of real-time information about weather or general flight conditions is from aviators who are right there with you. Air traffic control or flight watch may be able to provide you with pireps (pilot reports) that can give you information on current weather conditions from the pilots who are experiencing them. Unicom operators at airports along your route also can be helpful in relaying local conditions, and airports with AWOS (Automated Weather Observing System) will give you a continuous computer-generated update on weather conditions at the field.

A fine example of airborne CRM took place a few years ago in the Milwaukee area. A single-engine, single-pilot flight developed electrical problems at night while above the clouds, flying at 4,000 feet on an IFR flight plan to a nearby destination. Alert air traffic controllers discerned the difficulty when they lost radio communication and discreet radar transponder returns. All that remained was a primary "blip" on the radar screen. An airborne freight pilot in the vicinity (also landing in Milwaukee) agreed to try to help out and perhaps guide the luckless pilot to the field. The radar controller steered the freighter toward the electrically lifeless single-engine aircraft, who suddenly saw a multitude of "welcoming lights to follow." The freight pilot initiated a descent, and the single-engine pilot followed through the clouds, just maintaining visual contact with the "rescue ship." Both emerged from the low cloud deck and landed safely. A possible accident was avoided thanks to an outstanding demonstration of CRM, and communication, by an air traffic controller and the two pilots.

Communication is the key word when it comes to increasing flight safety through single-pilot CRM. Air traffic controllers generally are your first source for communication; however, flight service station personnel also are a helpful resource, ready to relay weather information, help with flight plans, or even provide a DF (direction finder) steer if you get lost. (See the *Aeronautical Information Manual* for more information on DF steer services provided by FSS.)

If you do get lost, it's time to get back to basics. Your training is one of the many elements of CRM. Use it. Remember the four Cs - climb, communicate, confess, and comply. The safe aviator knows when to acknowledge that things aren't going well and takes action to resolve the problem before things get worse. So, swallow your pride. Confess that you have a problem, and communicate that you need assistance. Climbing to a higher altitude will allow you a much better view of things on the ground, making it easier for you to identify potential landmarks. Locate a major highway or railroad tracks. Most of these lead into a medium to large town that may have an airport on the perimeter. Try to correlate what you see with what is depicted on your VFR navigation chart. When you descend, you may be able to see the name of the city or town painted prominently on a water tower. The advent of GPS navigation using the in-orbit constellation of navigation satellites will someday make getting lost a virtual impossibility, but until each pilot has with him or her a handheld GPS receiver, the old-fashioned tried-and-true methods of position identification are worth reviewing. Besides, any navigational tool can fail, so it's a good idea to always have more than one way to figure out your position.

If your VOR is working, tune in a VOR station near your last known position. Center the CDI (course deviation indicator) needle and fly to the station. Your ADF (automatic direction finder) can be used in the same way. Dial in a known NDB (nondirectional beacon) frequency in the area and follow the needle to the station. These procedures seem elementary; however, in an actual disorientation situation, emotions may run high, making it that much harder to solve the problem. That's true of any in-flight emergency or problem you may encounter. It's imperative to keep your emotions under control so that you can use all of the CRM tools that you have.

Air traffic control and flight service station personnel have a wide array of resources at their disposal to help them assist pilots in need. Why not visit the facilities in your area to learn more about their operations? These aviation professionals are generally friendly, cordial, informative, and enthusiastic about their careers. Many are pilots themselves.

A helpful phrase to start the process of using CRM to solve a problem would be simply "search and communicate." Search for solutions to problems using all available data and communicate with all of the personnel on the ground waiting to help you solve the problem and complete your flight safely. And don't forget to fly the airplane.

Seven Steps For CRM

Following is an easy seven-step guide that can help you maximize your single-pilot CRM skills if you ever find yourself with an in-flight problem:

1. **FLY** the airplane first. Keeping the airplane safely aloft is always your first responsibility.

2. **ISOLATE** the problem by eliminating possible causes and focusing on probable causes.

3. Find and use the appropriate **CHECKLIST**. This will help you isolate the problem and may tell you how to resolve it.

4. Determine **FUEL** and **TIME** available. It is very important to realize that fuel equals time. How much fuel you have left determines how long you have to solve the problem.

5. Consider **ALTERNATIVES.** Take a few minutes to consider alternatives and then gauge their validity against the original plan of action. A better alternative may or may not reveal itself to you in your search.

6. **LAND** or **CONTINUE**. Determine whether you must land immediately or if it is safe to continue to a suitable airport within the parameters of your fuel and time constraints. Depending on conditions, you may have to consider an off-airport landing.

7. Use all **RESOURCES** available. Communicate with all personnel on the ground who can assist you. Use all of

your available resources to enable those on the ground to utilize all of their resources to help you safely
complete your flight, especially in an emergency situation.

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