

# SINGLE PILOT CRM

by Rick Wheldon

**A**lmost 30 years ago, the FAA and airlines adopted the concept of Cockpit Resource Management. It was recognized at the time that human performance was the weakest link in the aviation safety chain, and CRM was designed to bolster human performance. Over the years, the concept was changed to Crew Resource Management to better emphasize the teamwork aspects of CRM. However, none of these concepts addressed the single pilot crew

Single pilot operations are inherently more dangerous than multi-pilot operations. Bob Breiling, the general aviation accident statistician, once told me that he calculated that, for any given model airplane, the likelihood of having an accident increased by 50% when operated by only one pilot. Yet, in the MU-2 community, we rightly value the freedom and flexibility of operating by ourselves. Therefore, the issue becomes “how can we best put the odds in our favor to minimize our chances of having an accident?” Borrowing from successful CRM techniques and modifying them for the single pilot environment is one strategy. NASA, in 1995, found that four out of five pilot errors that lead to accidents happened before the airplane ever left the ground! They also noted that the same mistakes were being repeated over and over again. How could that be?

I suspect that invulnerability, one of the five hazardous attitudes, fosters these repetitive mistakes. Human nature is such that we never envision ourselves being in an accident when we climb into our car. Yet, if we’re honest, we know that we sped through that last yellow light, or maybe it turned red. Nothing happened, so the next time we’ll probably do the same thing. The same thing happens airborne.

CRM is a tool to manage risk and reduce errors. It fosters good situational awareness, judgment, flexibility, attitudes and knowledge. It encompasses aspects of inquiry, advocacy, conflict resolution, decision making, and self-critique. Good CRM will reduce cockpit workload, and good pilots make flying appear effortless.

Let’s start with situational awareness. It’s a pretty broad topic, and can best be described as “seeing the big picture.” What is the condition of the airplane, the weather, you, the pilot, and your mission? What about the airspace around you? Are you aware of what just happened, what is happening now, and what is likely to happen next? Good situational awareness begins with a good preflight plan, and the preflight includes not only route, fuel and weather, but knowledge about your aircraft systems, performance, and anticipated tasks. A good preflight also involves research about weather, ATC, maintenance and passengers. Have

you established a list of Standard Operating Procedures for your operation? With SOPs, much of your flight planning is performed on the ground with plenty of time to consider the various options. Probably the best tools for preflight planning that I am aware of are the risk assessment tools provided by the AOPA Air Safety Foundation or various training agencies. These tools require an honest assessment of the pilot’s fitness, the aircraft’s suitability for the proposed flight, the weather and environment expected to be encountered, and the type of proposed operation.

Situational awareness can be enhanced in flight with a “mental scan pattern.” Attention might shift systematically from the aircraft, to the flight path, then to the passengers, then back to the aircraft. The “mental scan pattern” will vary according to the phase of flight. For example, during initial climb out, traffic avoidance and flight path considerations would predominate, while during cruise, passenger comfort would be a somewhat higher priority. During this scan, occasionally focus on what might go wrong – after all, that potential always exists. Of course, anticipating a failure leads to the consideration of how it might be handled. Throughout the entire flight, “back doors” should be available – alternate options if the original plan is not proceeding according to plan.

With this mindset, if something unpleasant happens, you'll be as prepared as possible.

How can you recognize that you've lost situational awareness? Some clues include stress, ambiguity, confusion or unresolved discrepancies, fixation or preoccupation, departures from SOPs, failure to meet planned targets, or just a plain instinct from your gut that all is not well.

Continually during a flight, distractions remain a possibility, and distractions can be minimized using a sterile cockpit concept when below 10,000 feet. However, even with a sterile cockpit, distractions can still occur. For example, nobody intentionally lands gear up. Instead, they most often forget to lower their gear because they are distracted by an emergency, or the checklist is interrupted by an unfortunately timed ATC instruction, or they were searching for another aircraft in the traffic pattern. Good pilots establish "reminders" for certain critical tasks. One technique is to hold the checklist on your lap until it is complete, and then set it aside. The presence of a checklist on your lap serves as a reminder that it has not yet been completed. Another reminder might be that, as you close to within 10 miles of the airport or the final approach fix, you slow to approach speed and perform the approach checklist. You might set the altitude alerter to field elevation as a reminder that you are cleared to land. Even with the checklist complete, short final should always be a last chance reminder to recheck the gear. My point is that there are any number of good habits that can serve as reminders to recover

after a distraction.

Self-briefings are an invaluable tool for inflight planning. A briefing is a systematic mental rehearsal prior to a flight event, and should be conducted before all takeoffs and approaches. Before taking the runway, you should review at a minimum your initial heading and level off altitude, as well as your plan in the event of an emergency. I have a friend who never fails to announce that "we're going to lose an engine" as he takes the runway. He's obviously thinking about what he is going to do in that event. At a minimum, the abort procedure and the engine failure after liftoff should be mentally rehearsed. An approach briefing should include the safe altitudes, landing distances and runway length, approach altitudes and courses, frequencies, lighting, where you'll clear the runway after landing, and, finally the missed approach.

Judgment is another element of CRM, and it is difficult to teach. One technique to improve judgment is to establish "bottom lines." Examples of bottom lines might be "I am comfortable flying an approach to minimums, but I will never bust them" or "I will not knowingly depart from the procedures in the AFM, checklists, or FARs." I have heard hangar talk where "(fill in the name) was able to complete an approach when everybody else was diverting." Some pilots see that as a sign of skill – I see it as a sign of foolishness. Good judgment also implies a realistic assessment of one's capabilities. Not everyone should be flying minimums approaches, and if you've just come from an argument at home, a tough flight is the last thing you should be attempt-

ing. Good judgment requires that the pilot will follow established guidelines and regulations. But, what about the case where a situation occurs that is not adequately covered by those guidelines. Al Haynes, piloting a United DC-10 near Sioux City, Iowa, lost all hydraulics. His only control over his aircraft was with engine thrust. His handling of the emergency presents the perfect example of a successful outcome not covered by procedures. Here, a "short term strategy" must be employed. The skilled pilot must first identify the situation that presents a risk, then, use all available resources to develop a plan to deal with it. In developing the plan, the pilot should probe for weaknesses, identify shortcomings, and carefully consider each possible action, and possibly, if time permits, conduct a summary rehearsal. Once implementing the plan, he needs to monitor for unanticipated consequences. The big point here is that there is seldom a requirement for hasty action. I once flew with an old captain who briefed that if anything happened, our first action was to sit on our hands. Our second action was to wind our watches. Once we had done that, and after we all agreed on the next step, only then would we move any levers or switches. Obviously, this was a bit of an exaggeration on his part, but his point was that there is very little that needs to be done hastily.

There are plenty of resources available to a single pilot to get him through a flight. Management of those resources greatly improves the odds of a successful outcome. CRM skills can be learned, and have a profound effect on reducing errors in the cockpit. **AAOG**