

SITUATIONAL AWARENESS



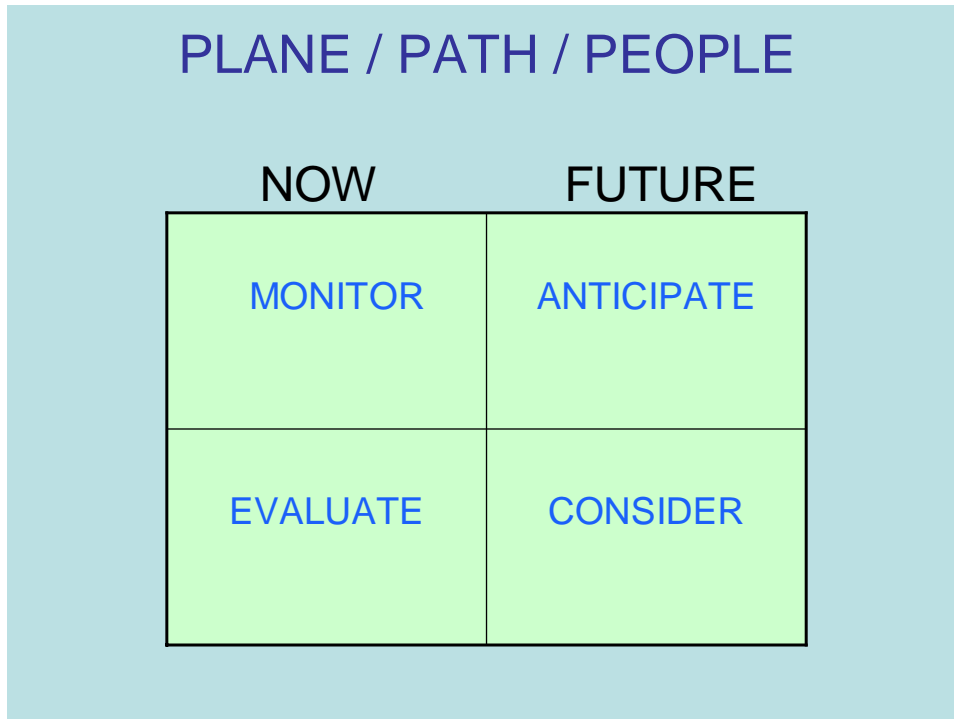
OR

HOW CLOUDY IS YOUR CRYSTAL BALL?

Situational Awareness is one of many subjects that are critical to building good Crew Resource Management (CRM) skills. There are others, but recent events show us just how deadly flying can be when we don't have a clear image of what is going on around us. I'm talking about the Comair crash in Lexington, KY this past weekend. I've flown on these very airplanes from that very airport. The lesson hits close to home for me.

Some warbird pilots might ask, "Why do I need to know about CRM? I usually fly alone." While that may be true, we often forget that our extended 'team' is made up of many people: the back-seater, an ATC controller, the weather forecaster, a wingman, even another aircraft on frequency.

Since situational awareness involves the present AND the future, three basic questions will come to mind: What? So what? Now what? Basically, in each situation, you'll ask yourself, 'What has or is happening? Why or is it important? What do I need to do about it? The chart below gives us a way to organize our monitoring of the airplane, its path, and the people involved, now and in the future. Each column requires particular skills.



MONITOR

It's a proven fact that people are better at doing things versus sitting back and monitoring what going on. However, glass cockpits force us to do just that! We spend much time on the ground pre-flighting and programming, and then hook it all up to the autopilot in flight and sit back to watch. Our hands-on skills also suffer if we don't practice.

We can use the analogy of a flashlight beam to make our point. When we focus the beam very narrowly, we only see a very small area. Eastern Airlines 401 crashed in the Everglades outside of Miami years ago because all three cockpit crew were focused on a burnt out landing gear indicator and no one was flying the airplane.

When we pull back and use a wide angle, we see a bigger picture. Perhaps, in the above situation, if someone had been directed to 'mind the store' that accident might never have happened. The point to emphasize is **DON'T GET SIDETRACKED!** Becoming distracted is often the first link in an accident chain.

EVALUATE

First of all, we must be able to comprehend what we see and hear in an airplane. Diligent study, professional habits, and excellent training help us to accomplish these tasks. Next, we must be able to assess each input as we become aware of it. We use our experiences from many previous flights to help us judge the validity, and importance of each event. Finally, we must understand the situation in which we have been placed. Again, we use experience, knowledge, and a logical approach to a given situation in order to start planning what to do next.

ANTICIPATION

You've heard instructors talk about staying ahead of the aircraft. That gets harder to do when you move from a 100 KIAS airplane to say a 400 KIAS airplane, four times as fast! To predict what is going to happen, you need to practice maneuvers and use really excellent cockpit organization and checklist flows. This is an important point: standard procedures and good checklist discipline help to keep you 'ahead of the power curve.' The things that can be done the same way every time should be, so you can focus on what's different today, i.e. weather, weight, runway, etc.

Lastly, it is VERY important that we understand the duties and responsibilities of each team member. If you have a qualified back-seater, is he flying, talking on the radio, or just backing you up with a second nav/com. Do you understand what an ATC controller is responsible for during IFR or VFR Flight Following? Dividing up duties and responsibilities and then knowing who is responsible for what is critically important especially in a high-workload environment such as take-off, approach, and landing.

CONSIDER

Remember, not every situation can be predicted. I'm reminded of the United Airlines 747 that had taken off from Honolulu some years ago, and had the forward cargo door rip off the aircraft. The two right-side engines were either failed or damaged, they had structural damage affecting controllability, and they were VERY heavy. Yet, they made a completely successful emergency landing back at HNL.

In the airlines, we spend quite a bit of time practicing these 'what if...' scenarios in full-motion, high-fidelity simulators. Everything from engine failure to multiple failures, windshear to CAT III weather, can be thoroughly and safely practiced. You can do much the same with an experienced instructor in your own warbird. When was the last time you practiced an SFO, no-flap landing, instrument approach, or unusual attitude recovery?

TRAPS

There are many traps that keep us from good situational awareness while flying. The first is focusing on the right information at the right time. This ties in with distractions that are all around us. Again, Eastern Airlines 401 is a perfect example. We also need to learn to listen to that inner voice. If something doesn't feel right, either we don't have all the information we need, or something really isn't right. Either way, we need to voice the concern and investigate the situation until it is discovered, or we have the information we need to be comfortable again.

Being either busy or bored can be a trap to situational awareness. We can miss what's going on in both cases. That's why good habits are a real life-saver. Professional diligence and discipline helps you to stay aware even when you're busy or bored. Remember though, bad habits can hurt you.

I'm reminded of an F-4 pilot that transitioned to the A-10. He had an engine failure on take-off and reached for the emergency brake handle. Unfortunately, the handle was on the opposite side of the cockpit from the F-4. What he got was the canopy emergency jettison handle. You guessed it: negative transfer is a potential problem when you transition to a new airplane.

Our own expectations can get in our way. When you verbalize 'down three green', are you really looking for the actual indication? This ties in with the fact that our systems are generally very reliable. They don't often fail. Couple this with the fact that some system failures are subtle and you have the makings of a trap.

Remember that activities that take a long time to accomplish are less likely to get done right for many reasons to include their complexity as well as the possibility of being distracted. Checklists and instrument approaches are examples that come to mind. And finally, it is critical that we understand how to program and use the equipment onboard. Automation sometimes hides the information we need the most.

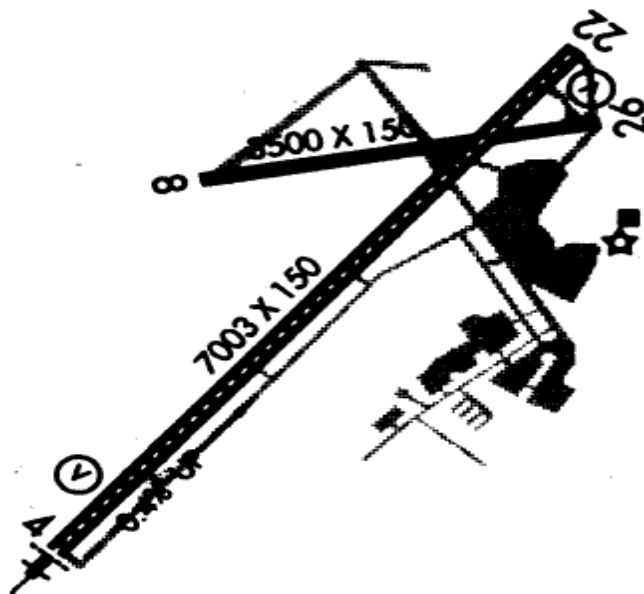
As you work at managing crew awareness during a situation, ask yourself these three questions: What does someone else know that I need to know? What do I know that someone else needs to know? What do none of us know that needs to be discovered?

ACCIDENTS

There are so many accidents that can be studied for their lessons in situational awareness. We've already talked about Eastern Airlines 401. How about the Delta Air Lines B-727 that took off from DFW without flaps? They barely got airborne before the plane stalled back onto the runway, broke apart, and burst into flames. The crew had a ground delay, had a flight attendant in the cockpit, and did not run their checklists. The results speak for themselves. Distractions and lack of checklist discipline led directly to a fatal accident.

The American Airlines Flight 965 crash in Cali, Columbia is an excellent example of mismanaged communication and navigation. It was night, there was no radar coverage because rebels had blown up the radar site, and the crew seriously misunderstood a route clearance they were given as a clearance direct. The landing runway was changed at the last minute and they were in a hurry to lose excess altitude. Finally, they programmed the Flight Management Computer (FMC) direct to the wrong NDB and flew into a mountain.

Finally, I want to talk about the recent Comair accident in Lexington, KY. The flight pushed back an hour before sunrise, the crew was probably quite tired after a short night of rest, and they taxied to a spot where two runway ends are VERY close together, Runways 22 and 26. The preliminary finding is that they took off on a 3500 ft runway, not the intended 7000 ft main runway and ran off the end.



This was a VERY avoidable accident. One look at the airport diagram would have shown the danger of the two runway ends being very close. Also, the runway numbers are painted on each runway surface. Lastly, in Map Mode on the Nav Display (ND), the runway position and angle to the aircraft's heading would have been immediately obvious as they took the intended runway for departure.

CONCLUSIONS

I'm sorry for the long article but it shows us there is so much to learn with regards to safely flying high-speed, complex aircraft. Within our own community this last 12 months, we've had two L-39s, an F-86 and a Hawker Hunter accident that all show us there are lessons to be learned about situational awareness.

If nothing else, I hope this article gets you thinking about, and discussing your own operations with your peers. Remember, no matter how experienced you are, you can always learn more, and you can always practice to be more proficient. As always, fly safe and check six...

Richard 'Mongoose' Hess

