Being Streetwise in Aviation

Based on an article from Safetyliner - United Airlines

What makes a pilot "street smart" about flying? By "street smart" we mean: awareness of the essential aspects of flying; ability to know where and when to find critical information; ability to detect and compensate for the mistakes of others; ability to avoid the subtle traps and pitfalls found in the flying environment; and ability to complete a 30-year career without any accidents or serious incidents. Thousands of pilots do this each year - complete a very successful 30-year career without a single incident or accident. Is this just luck, or are there specific identifiable reasons for these superb records?

To find the answer to this question, *Safetyliner* conducted some years ago a telephone survey with selected pilots in the industry. Each pilot had at least 25 years of experience. Our group included pilots from six countries and from airframe manufacturers, NASA test pilots, military pilots, UAL line pilots, Chief Pilots, Fleet Captains and instructors. In each case they posed the following questions, and then let the interviewee respond as he or she saw fit.

1) **What, in your opinion, makes a pilot "street smart" about flying?**
2) **To what do you attribute the fact that you have never had an accident?**
3) **Will you share with Safetyliner's readers your thoughts, techniques or strategies which have helped you achieve this excellent safety record?**
4) **Are there any systems or factors which you consider more important than others?**
5) **Do you consciously monitor any particular areas to increase your awareness of critical safety items?**
6) **If you were to advise a new, minimal experience Captain about how to avoid the pitfalls of flying, what would you tell him or her?**

Safetyliner was surprised that the answers covered a very wide spectrum of topics; therefore, they grouped the responses into three categories :

- Attitude or Mind Set - a predisposition to do things in a certain way.
- Teamwork, Crew Coordination, and Crew Interaction.
- Awareness - individual techniques and strategies, specific items to monitor.

The responses are not ranked or put into any particular order and are presented as close to the original comment as possible. Many of the responses were very similar, in which case Safetyliner selected the most comprehensive comment.

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ATTITUDE - MIND SET

- There's almost nothing that needs to be done in a hurry in an aircraft.
- Plan ahead for normal events and be prepared for unexpected contingencies.
- Pay attention to your sixth sense. If something feels wrong, it probably is.
- Develop an assertive attitude and openly communicate concerns to other crewmembers.
- Keep your options open - never become committed to a single course of action with a high degree of risk.
- The way to be safe is never to be comfortable.
- If you are getting rushed or overloaded, slow down even if it means delaying pushback, delaying takeoff or even holding.
- Flying must be the focus of your interest; you must want to do a good job. Stick to Standard Operating Procedures unless they are obviously inadequate.
- Return to basics if you become confused.
- Maintain a healthy level of suspicion.
- Even though pilots sometimes like to give the opposite impression, a true professional is responsible, diligent and studious.
- Eliminate distractions and maintain an alert, vigilant mental state.
- Avoid complacency; the minute you think something won't hurt you - it will!
- Never go on a flight with a head full of problems; leave them on the ground or stay on the ground yourself.
- Be especially vigilant when everything is going well. For example, the difficult approaches like CRW, SAN, MDW, HKG, or poor students (if you instruct) won't hurt you since you are already alert and aware of the risk. You must resist the tendency to become complacent when everything looks normal.
- Be open minded to constructive criticism.
- Always fly in the same standard way regardless of whether it is a normal line flight, an enroute check, or a proficiency check.
- The common thread among all survivors is common sense.
- The things that get pilots in trouble are incorrect premises and fixation.
- Don't become complacent; sit on the edge of your seat; never take anything for granted; never become relaxed; question everything; stay alert.
- Never assume anything, but verify and cross-check all critical information.
- A pilot must be able to adapt; no two situations are the same.

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TEAMWORK - CREW COORDINATION - CREW INTERACTION

- Share information with your crew. To the extent that you share information with them, they will share information with you and tell you if you have made a mistake.
- Don't try to do everything yourself.
- Use SOP's so everyone knows what to expect.
- Surprises are nice on birthdays and Christmas, but have no place in aviation. Let everyone know what you are thinking, planning, and doing.
- Always question; don't assume.
- The first thing the Captain should do is to mold the crew into a team.
- Briefings are very important; talk through what you are going to do; everyone should participate.
- Use your crew; frequently I have found another crewmember has just the information I need.
- Evaluate the people you fly with - to understand and compensate for their strengths and weaknesses.
- Maintain redundancy in the cockpit. The pilot not flying must cross-check the actions of the pilot flying and bring discrepancies to his attention.
- Communication among the crew, and especially with ATC, is critical in today's saturated ATC system.

AWARENESS - TECHNIQUES - STRATEGIES

- It is important to have mentally prepared strategies to deal with critical operational situations. For example, if you lost an engine in a B-767 at 30 degrees West, where would you go? What if you were in a B-747?
- Flying safely is effectively managing change. The items which I monitor vary with whatever is changing. For example, before beginning to taxi, I think about the risks and problems associated with taxiing. Items like - receipt and dispatch procedures, maximum breakaway thrust, taxi route, wingtip clearances, avoiding runway incursions, etc. Before takeoff, I review the performance data, RTO procedures, engine-out procedures, the departure route and terrain proximity. Any time something changes - and it can be a small item like a 4,000 ft altitude change or cross-feeding fuel - there are new risks which must be monitored and managed. My briefings also focus on whatever is changing so there will be total crew awareness.
- Pilots should give equal priority to landing or going around. Never assume that any approach will end in a landing.
- Know what data is driving the flight director bars and always monitor and believe the raw data.

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- Awareness is the sum total of a lot of little things which vary with the phase of flight. For example, prior to taxiing, I review the taxi route in relation to the active runways; prior to taxiing onto the takeoff runway, I clear the approach path (one time in 38 years of flying there was an aircraft on a 1/4 mile final); prior to beginning descent, I review my fuel options; prior to landing I calculate where the glide slope intersects the runway and the length of remaining runway. These things are not taught in training - you must figure them out yourself.

- Detailed knowledge of the Flight Management System (FMS) is essential in all glass-cockpit aircraft.

- Develop a rule of thumb for validating V2 and VREF on every takeoff and landing.

- During overwater operations, fuel, or lack of it, can quickly limit your options and should therefore be considered a critical system.

- Trouble can begin when the wheels touch the runway; yet everybody seems to relax then.

- Pay special attention to memorizing all of the FMS applications. It is important during critical phases of flight to be able to quickly get the information you need without thinking about how to do it.

- Controlled Flight Into Terrain (CFIT), runway excursions, runway incursions, and high speed RTO's are the greatest safety risks in aviation today.

- Before each flight, I typically spend about one hour at home reviewing the route and airport information. If it is my first flight into an international airport, the time required will be 2-4 hours.

- During international operations, pay particular attention to the meticulous details of navigational procedures.

- Maintain a terrain awareness and a general knowledge of the topography over which you are flying.

- Commit SOP'S, limitations and emergency procedures to memory, to free up mental capacity to deal with unforeseen events - the more you know, the more time you will have.

- After each flight or proficiency check, I debrief myself and record items I want to change in a notebook. The act of writing it down causes me to memorize the change.

- Know where you want to be, where you are, and where you are going.

- The Captain must always be able to recognize the onset of inattention in himself or his crew.

- You don't know what you don't know. The secret of a long, safe flying career is to reduce the "don't know" category as much as possible.

- Don't touch a switch without looking and knowing what, when, and why you want to move it.

- Be totally aware of what is around you, particularly during takeoff and landings.

- The very best pilots I have checked out have consistently demonstrated the ability to see the big picture and not become fixated on anything. Even during approaches in minimum weather conditions, they don't become "locked" on the gauges until inside the outer marker.

- It seems to me there are three levels of awareness: The first is the awareness which comes from completing a typical transition course - systems knowledge, SOP'S, normal, irregular, emergency procedures, and initial operating experience. Next is the awareness which comes from information from others - asking questions, inquiry, crew coordination, CLR, etc. Finally comes the awareness which comes from continually reading the books and manuals; figuring out the traps of flying; and developing personal strategies, techniques and habit patterns to deal with them. This third area is the most difficult and requires considerable personal commitment and discipline.

- You don't have time to make all of the mistakes, so you have to learn from others. I review all accidents and ask myself what would I have done? How could I have avoided the accident?

- If anything is out of the ordinary or if the aircraft is not performing the way you think it should, check it out.

- Develop effective listening skills including the ability to filter out lower priority information and return to it later.

- Listen to others and find out how they do things - then re-evaluate your own habit patterns.

- Always have both a plan and a contingency plan. For example, I review destination and alternate airport weather an hour before landing and then calculate the required fuel from the primary holding fix to the runway and then to the alternate airport.

- If there is any doubt about an ATC clearance, I ask for confirmation from ATC.

CONCLUSIONS

We hope the above comments collectively present some insight into how a selected group of pilots have completed over 1,000 years of accident-free flying. We are not suggesting that everyone accomplish each of these techniques. The comments should be regarded as items which some pilots find useful.

It is very interesting to note that none of the responses involved the "stick and rudder" aspects of flying. From a safety perspective, this is right on target since it is hard to think of an accident in which the pilot couldn't fly the aircraft. While the engine-out on takeoff, engine-out approach to Category 11 minimums, engine-out missed approach and non-precision approach maneuvers may be the causes of most repeated items in proficiency checks, they are not the causes of most accidents. When accidents are classified as "pilot error," it is almost never because of a 11 stick-and-rudder" deficiency, but rather because of some event that perhaps could have been overcome with one or more of the techniques noted above.