What causes aviation accidents?

Aviation accidents are caused by a number of factors, ranging from deficiencies in the machines, to incorrect decisions made by humans and environmental issues. Systems do fail from time to time, and as humans, we make mistakes and the environment can have an influence. Some of these
factors we can control, but some are out of our control. It is sad when an accident occurs, and lives are lost; yet the fact is that some accidents are avoidable, they ought not to happen. The question is, why do they happen if they are avoidable and what are the exact causes of these accidents; what are the events that lead to these accidents? In this article we will address the causes of accidents. These accidents mostly occur in the general aviation arena during private operations.

**Accidents in private operations.**

The statistics reveal that we have more accidents in the private operations category than in commercial aviation activity. The expectation is that we should have more accidents in training operations than in private operations, but this is not the case. This then poses a very important question to the flying schools and flight instructors: Do we release the pilots too early before they are ready to conduct solo flights? Why is it that during training under supervision, the pilot is less likely to be involved in accidents? The answer is clear; it is because they are under the guidance and the supervision of the instructor. What happens then after the student has qualified and flies solo? This is when difficulties come to the fore. Is it because the student was not ready to qualify as a private pilot or was the training flawed?

Another issue that comes to mind is that of recurrent training. Recurrent training can be explained as training conducted by an operator for flight crew on an annual or ongoing basis. Recurrent training refreshes an employee's memory on company operating policies and ensures that each person is adequately trained and currently proficient in company equipment and procedures. In addition, recurrent training should encourage all employees to continue using safe operating practices in the workplace. Recurrent training may consist of ground and refresher, aeroplane and simulator, emergency and safety equipment or flight deck crew resource management training. There is no requirement in Part 61 (Personnel licensing) or 91 (Rules of the air) of the SACAR for pilots to undergo recurrent training. This simply means that the general aviation or private pilot does not have to undergo recurrent training. Although this is the case, it is in the best interests of private pilots to keep themselves current.

Another problem inherent with flying for pleasure and not for commercial purposes is that these pilots don’t fly on a day-to-day basis. This means that their skills might become rusted. It is therefore a good idea for private pilots to keep themselves current.

The graph below indicates that in the past 5 years (2006 – 2010) 65 % of accidents occurred in private operations, followed by 18 % in training operations.
Let us then explore the actual causes of these accidents.

**Causes of Accidents**

The probable cause of the accident is established after the investigation into the accident has been completed. All evidence/facts are analyzed by the investigators and the team of experts to establish the probable cause of the accident. For the period under review, most accidents were attributed to errors or omissions by the flight crew/pilot. *Mechanical/Engine/Powerplant* is the second leading cause of accidents.

*The graph below indicates the broad causes of accidents.*
In this article we will explore the Flight Crew/Pilot causal factor. We will interrogate the first top 5 causals in detail. We will look into the aspect of poor technique/airmanship in this article; the rest will be addressed in articles to follow.

**Poor Technique/Airmanship**

Airmanship can be described as skill and knowledge applied to aerial navigation. Airmanship covers a broad range of desirable behaviours and abilities in an aviator. It is not simply the measure of skill or technique, but also the measure of a pilot’s awareness of the aircraft, the environment in which it operates, and of his own capabilities. It can further be defined as a sound acquaintance with the principles of flight, the ability to operate an airplane with competence and precision both on the ground and in the air, and the exercise of sound judgment that results in optimal operational safety and efficiency.

Let us look into some of the accidents that we have on our database that were as a result of poor airmanship. Weather and the aircraft mechanics were not factors in the cause of these accidents. Readers can log on to [www.caa.co.za](http://www.caa.co.za) to read the full accident reports. All these accidents were avoidable accidents, but only if the pilot had taken the correct actions.
Case 1

The aircraft porpoised during landing and in an attempt to recover, the student pilot landed the aircraft hard on its nose landing gear, resulting in a landing gear collapse.

Case 2

Following an unanticipated right yaw, the pilot followed an incorrect recovery technique that reduced the tail rotor effectiveness to such an extent that he was unable to recover from the yaw.

Case 3

During the lift-off, the pilot failed to compensate for the weight and gravity shift and as a result the helicopter entered into a dynamic rollover. Since it was very close to the ground, he/she was unable
to recover from the situation. The pilot used a poor technique during lift-off, which resulted in the helicopter entering a dynamic rollover.

Case 4

On final approach, the pilot rounded out too high above the runway. The high round-out resulted in the aircraft’s airspeed decaying and the aircraft entering into a stall. The left wing dropped and the aircraft struck the ground. The aircraft's airspeed was allowed to decay, causing the aircraft to enter a stall.

What could be done to avoid such accidents which are as a result of poor technique/airmanship?

**Familiarity with aircraft:** it is essential that pilots familiarize themselves with the aircraft. Accident reports have revealed that some pilots are rated in more than one aircraft. In some instances, the pilot uses one aircraft type more than the other. It was found in some accident reports that the pilots are likely to make mistakes when they fly the aircraft which they don't often use. The SACAR requires that the pilot fly at least 3 hours in a year in order to remain current. But is that sufficient? It is true that there could be financial implications here, but on the other hand safety must not be compromised. We need to strike a balance here. Hence the issue of familiarization is a critical one.

**Flight planning:** Flight planning is critical. This will prepare the pilot both mentally and physically. The pilot will know what to expect on the flight path ahead. Situational awareness is also important. Familiarize yourself with your surroundings, know where you are and what alternatives do you have in case of emergency. Ask yourself the “what if’s” and prepare yourself on how you would respond to a possible emergency.
Fatalities in poor airmanship

The flight crew/pilot causal has a total of 138 fatalities for the period under review. Poor airmanship accounts for 11 of the fatalities. The number one killer is Controlled flight into Terrain, which will be dealt with in the next article. One lost life is one too many, especially if the accident can be avoided.

**Total causal for 5 years - Flight Crew/Pilot**

- 7.41 Poor technique/airmanship: 21
- 7.57 CFIT: 42
- 7.2 Failed to look out: 20
- 7.1 Error in judgment w.r.t landing/...: 18
- 7.26 Failed to maintain flying speed/Stall: 16
- 7.19 Failed to extend landing gear: 7
- 7.4 Disregard for Standard/Safe/Regulatory Operating...: 6
- 7.20 Lost directional/ lateral/ longitudinal control on...: 6
- 7.7 Inadequate or no Pre-Flight: 4
- 7.48 Loss of control: 3
- 7.14 Improper use of flight controls: 3
- Improper use of emergency system: 2
- 7.42 Distraction/Diverted attention: 2
- 7.39 Lack of/inadequate flight crew supervision: 2
- 7.38 Exceeded aircraft design limits/speed: 2
- 7.31 Downwind take-off/landing: 2
- 7.22 Lost in adverse weather: 2
- 7.12 Spatial Disorientation: 2

**Conclusion**

We can all make a difference when it comes to aviation safety. Let us start debating the issues and come up with interventions to make our skies safer. We all have a role to play. As an instructor, ask yourself if you have taught the students all they needed to learn and have equipped them with the necessary tools to ensure safety. Ask yourself, ‘what kind of a culture am I inculcating into the student? What kind of a mindset does the student have and what can I do to influence it positively?’ As a student pilot, ask yourself ‘am I really ready to go out there? What kind of a mindset do I have regarding safety?’ As a qualified pilot, ask yourself, ‘am I keeping myself current regarding aviation safety? What can I learn from fellow pilots?’ Check whether the aircraft is serviceable, how the weather is ahead, anticipate emergency satiations and mentally prepare yourself to respond to these. Very importantly, also let us use our aero clubs to learn from one another.
You are most welcome to invite the accident investigators into your club meetings to share some of the accidents and lessons learned from these statistics.

In the next article, we will look at the phenomenon called Controlled flight into Terrain (CFIT). It is the number one killer in the general aviation sphere.

Until next time!!!

We appreciate your feedback/comments; please direct them to Ms Bongi Mtlokwa at mtlokwab@caa.co.za, 011 545 1238 (Tel), 011 545 1466 (Fax).