GA FEEDBACK

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CHECKLISTS CAN MAKE THE DIFFERENCE

One of the potential dangers for GA pilots is the tendency not to use checklists when flying in an aircraft with which they have become very familiar. This can render them vulnerable to mental errors, particularly when under pressure or distracted.

A similar potential trap for the unwary exists in the case of pilots who use mental checklists, when flying different aircraft types with important technical differences.

Examples of both types of risk are detailed below:

(1) A PERFECT TOUCHDOWN - ALMOST!

On a CAVOK day, I was returning to land at base on the westerly runway. The sun was shining directly down the runway. It had been snowing 24 hours earlier and up to 4 inches was lying about. However, a path had been cleared wide enough to make a safe landing.

My first approach was too high and I initiated a "Go-around". The second approach was good and I flared into what appeared to be a perfect touchdown. Imagine my surprise when the nose wheel and starboard main collapsed resulting in a propeller strike and some minor dents in the starboard leading edge.

My immediate reaction was to check that I had lowered the undercarriage - I had not. It was my normal practice always to extend the wheels manually, even though the auto device was activated. On this occasion my error in not checking for three greens had led to the total reliance on the back-up system, which had locked on one wheel but not the other two.

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(2) EASY TO GO ... HARDER TO STOP!

After landing at a local grass airfield, a member of the group decided not to attempt a take off and to leave the aircraft overnight, as the ground on the lower parts of the runway was soft.

Early the following day, other members of the group drove to the airfield. Although the ground was still soft the aircraft was "wing walked" to the upper end of the runway. With only the pilot on board the aircraft took off using the soft ground technique.

When the aircraft landed at the group's home base, it veered off the hard runway to the right and into a ploughed area, bending the starboard U/C. When the pilot exited the aircraft the ground crew noted only one skid mark on the runway and the right-hand parking brake latched on!! *(This type has individual parking catches for each main-wheel brake)*

The soft grass, high power to weight ratio and big rudder had permitted a safe take off, but the dry hard runway did not forgive the pilot error.

Sound Pre-Take-Off and Downwind checks are a must.

All aircraft can bite!

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(3) CONDITIONED RESPONSE

I recently undertook twin training for the first time. During my single engine flying, I have always included in my downwind checks, the mnemonic BUMFPICH, to account for retractable undercarriage (U) and variable pitch props (P), as I also fly a glider with retractable U/C, and occasionally a single with a variable pitch prop. This has meant that during my downwind checks on non-complex types, the U for undercarriage has always prompted the response 'down and locked' in a fixed U/C type, and the P for prop has always prompted the response 'not required' in a fixed pitch type.

During my first landing in the retractable twin, my downwind mnemonic elicited the U 'U/C down and locked' correct verbal response, but without the necessary action of physically moving the U/C lever. The verbal response to the U for U/C had become a very well conditioned response, requiring no conscious attention. Such conditioned responses lay in wait for all of us, ready to catch us out when we least expect it: that is, when we are occupied with a more pressing task. It is not surprising that many wheels up landings are made each year. The U in my downwind mnemonic will now

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elicit the response 'U/C fixed or retractable? If retractable, lower the U/C and check for three greens'.

Conditioned responses require no attention and can be executed automatically in response to the required stimulus. In my case both the stimulus and the response were both verbal!

Fortunately my instructor noticed my error before any damage was done, highlighting a most valuable lesson.

The simple and cheap solution is to carry a written checklist and always use it.

Also, professional pilots are conditioned to carry out a finals check that the aircraft is configured safely for landing. Many 'old and less bold' pilots have been saved by the following three-item finals check:

- Undercarriage, Flaps, Propellers/Mixture.

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PROPELLERS CAN ALWAYS BE DANGEROUS

A light twin aircraft had just arrived back at base, having had new avionics fitted to comply with 8.33 KHz spacing requirements. Several pilots were keen to see the new NAV/COM/GPS unit prior to a training flight.

Once shut down and parked on the apron, three pilots entered the aircraft by the main passenger door. The first pilot sat in the P1 (left) seat and switched on the master switch. A second pilot began to manoeuvre into the P2 (right) seat. As he did so his head brushed against the right hand engine start button (mounted on an overhead panel). The right hand propeller turned over several times in consequence without any aural or visual warnings to anyone on the apron.

I watched this, as the third pilot standing behind the other two pilots, who are both ATPL/CPL's.

Non-standard procedures, such as that described, provide ample opportunity for the inadvertent operation of important controls. The safe option for both you and others is not to power-up an aircraft until all operating seats are occupied and the area around the aircraft is confirmed to be clear.

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A CLOSE CALL

Here is an example of how events can conspire to form a 'gotcha'! Having just finished a dual trip with about one third tank contents remaining, I parked the aircraft by the fuel pumps. Refuelling at this airfield is efficient and the refueller was present, attending to another club aircraft with mine next in the queue.

I was away for a half-hour, briefing my next student and getting a much needed coffee. On walking out to the aircraft I was fully confident that the aircraft would have been refuelled, nevertheless, I asked the student if he had checked visually. He said he hadn't, so, mindful of the need to reinforce good practice, I told him to do so. It's worth pointing out that the CFI had described this student to me as "well above average", he was also very close to the end of his PPL training.

The student climbed up onto the wing step and removed the fuel caps. He commented that they were not brimful. My response was that they usually filled to a couple of inches below the top to save fuel from slopping out of the vent. He looked again, then, satisfied, stepped down, climbed aboard and off we went. The fuel gauges in this particular aircraft were placarded as unreliable and read half-full throughout our one-hour flight.

After landing I parked on the ramp and walked away without a thought. Sometime later I was chatting to a club member, who commented that he had flown that particular aircraft after me and was surprised a) that I hadn't parked 'on the pumps' and b) that I must have been running on fumes as he uplifted almost full capacity. The aircraft had not been refuelled prior to my flight!

I have thought about this several times since. In view of the known problems with the fuel gauges it's easy to say I should have checked myself, but there were a lot of factors that made it all too easy to fall into this trap.

Many serious accidents have resulted from the simple omission of ensuring that there is sufficient fuel on board to complete the intended flight with appropriate reserves.

In this specific case, the inherent risk in relying on the student's judgement is obvious.

More generally, where there is any doubt about the fuel load, or as a matter of simple good practice, the tanks should be dipped. The procedure will take but a few minutes, but might save your life.

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JUST A MOMENT'S INATTENTION

The flight was a training flight in a microlight as part of an Assistant Flying Instructor Course (AFIC). The lesson subject was "Engine failures in the circuit". The flight had been preceded by a pre-flight briefing given by the AFIC student, based on an example briefing delivered previously by the AFIC instructor, who was the Pilot-in-Command (PIC). The briefing included discussion on safety aspects of the flight, action in case of real engine failure, handover of control etc.

The flight followed the order given in the brief, dealing first with simulated engine failure on the latter part of the circuit, working gradually back to engine failure after take-off. The PIC re-demonstrated simulated engine failures, on the crosswind leg and after take-off at approximately 300 feet. In the latter case, the aircraft was landed straight ahead on the runway to show the

student AFI the latest point at which this could be achieved.

Following this re-demonstration, the student AFI took control. The intention was to repeat the exercise with the student AFI playing the role of instructor, and the AFIC course instructor role-playing a typical student.

The student AFI took off and unexpectedly simulated a power failure during climb-out at approximately 150 feet. The AFIC course instructor (the PIC), on realizing immediately that this was below the recognized minimum height for conducting this exercise on this aircraft, attempted to apply a "standard stall recovery" ie simultaneous stick forward and application of full power. The student AFI had already lowered the nose as part of the demonstration he was carrying out, but was holding the power lever closed. (The two power levers are joined by a torque tube across the floor of the aircraft) Before the PIC could say "I have control" the aircraft hit the ground. The undercarriage collapsed and the fuselage crumpled, trapping the feet of the PIC between the floor and the dashboard. The fibreglass petrol tank ruptured and within seconds the wreckage was in the middle of a large pool of petrol. The engine was still running at medium RPM and because of the deformation of the fuselage the propeller blades were grinding away at the runway tarmac, throwing off a stream of fragments. Sensing the fire danger from sparks off the propeller, both crew attempted to stop the engine. The magneto switches failed to produce a result, as the earth wires had been disconnected in the crash, so the fuel cock was selected "off". This had little practical value as the remaining fuel contents were on the runway. The student AFI managed to free the PIC's feet but the PIC found he could not climb out due to a back injury. He managed to roll out then roll clear of the wreckage, through the spilt petrol. The student AFI, who was not injured, summoned the emergency services.

The PIC suffered a compression fracture of the vertebrae and was unable to work for several weeks. The aircraft was written off.

What were the Human Factors in this accident?

This was to be the last flight of the AFI course. It was the last flight of the day and the last of a busy week. Following this flight, the PIC was to have been picked up from the aerodrome by his partner, when they were to start a short holiday.

Post-accident discussions between the AFIC instructor and the student AFI revealed that, following the PIC's demonstration and during the taxi back to the threshold, the student AFI had told the PIC that he wished to change the order of the demonstration he was to give. The PIC had no recollection of this. This accounts for why he was completely taken by surprise at the student AFI's action, and may have taken a few milliseconds more to react than if he had been expecting it.

This PIC is not noted for daydreaming, but could it be that the brain went on holiday an hour ahead of the body?

This excellent, detailed account was submitted by the PIC himself in order that others might learn from this unfortunate incident. Several important lessons are apparent:

- ***Ensure that the briefing is clearly understood and any limitations are emphasised.***
- ***All exercises should be practiced at a height sufficient to permit the instructor/PIC to assume control and recover safely.***
- ***Even the most experienced 'students' are also liable to make mistakes. Be prepared for this eventuality.***

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A LACK OF LOOKOUT

I was one of five pilots flying in loose formation at 1000ft agl with visibility of 10-12kms, heading due south in slow-flying machines for a grass airstrip in the Chiltern Hills. We were all on radio and had 'block' radio consent from a nearby airfield to enter the eastern end of its zone.

Almost at the same time two of us spotted a Cessna - probably a 172 at first glance - coming from the west at the same height as us and at about 10kms. We warned the other three in our group. We all continued to keep a good look out in what can sometimes be a busy patch of sky. The Cessna continued straight and level - it was now obvious he was coming straight at us and we would close within 30 seconds. The leader of the five did a right, descending turn and the other four of us followed.

As the Cessna went past I could see the pilot - engrossed either in his instruments or in a map or other paperwork. I noted the aircraft registration.

Blow me, about two minutes later and when well in sight of our destination, the same Cessna came back towards us, at the same height - and promptly overflew the destination airfield about half a mile in front of us, disappearing to the west as if nothing had happened.

Later in the day, back on our home airfield, I was able to establish the ownership and base airfield of the Cessna, so I telephoned the airfield manager.

He went off, to return a minute later to announce that the Cessna pilot was a man with over 300 hours logged who had not flown much recently. He had hired the machine to get some hours in so he could renew his licence: "He says that he never saw any of you, either time."

I asked what the pilot had been doing and back came the reply: "Oh, he was lost and was trying to establish his location, to land at his intended destination (another

nearby airfield). He was trying to find his position on the half million map."

A true case of getting a fixation inside the cockpit rather than keeping a good lookout.

It could have been a killer - both for him and us.

It is important that incidents such as this are reported by filing an AIRPROX report.

Also, the practice of 'looking out and glancing in' is designed to prevent the type of fixation reported.

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YOU ARE NOT ALONE IN A CIRCUIT

As a student pilot undergoing training in Florida, I was practising circuits at an airport near Orlando. After taking-off and climbing, at about 500ft I lowered the nose to check for aircraft ahead, ready for a left crosswind turn and radio call. To my surprise and horror, a single engined aircraft was directly in front of me and no more than 100-150ft away, filling my left window. Initial thoughts were to continue left and avoid the aircraft, but realising his trajectory was right to left moving into my flight path, I elected to do a steep controlled turn to the right behind him. Noting the whites of his eyes and slight wing wobble I guessed by this time he must have seen me! I rejoined the visual circuit and landed and went for a coffee break and a cool down.

What did I learn?

- Never to take for granted that the circuit is yours.
- Always keep a sharp lookout at all stages in the pattern and make more lookout checks when flying high winged aircraft..
- Assume that not everyone is using his/her radio correctly.

As one instructor said to me, "You've obtained your license to learn, use it wisely".

One further important point - Confirm that the initial climb out flight path is clear before commencing the take off.

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ADF CODING - A VITAL CHECK

I was conducting an initial IRT with an applicant from a local Approved Flying School. The applicant had completed several holds due to traffic density, before being cleared for an NDB/DME procedure to the Southwesterly runway.

He descended outbound, correctly tracking in accordance with the procedure to 7 miles DME and was turning inbound at the Platform Turn altitude of 1700ft.

During the inbound turn I suspected that the ADF equipment was giving false indications although, of course, the aircraft equipment has no failure indication. The applicant had clearly not noticed and continued to follow the 'floating' ADF needle in an attempt to intercept the published inbound track. As far as he was concerned, he had flown well through the inbound bearing and so he continued his turn onto a southerly heading to 'push' the needle back.

Fortunately, there was no local traffic and our antics were being monitored by the Radar controller. Eventually the controller felt forced to intervene and turned the applicant onto a parallel track to sort out the situation. We had tracked at least five miles east of the intended approach. In this situation, both the controller and I were monitoring the approach, but there are serious safety implications in this incident for pilots flying NDB approaches, especially when acting as Single Pilot Crew and at airfields without radar monitoring. Had the failure occurred one minute later, AFTER the final approach fix, the pilot may well have continued his approach to minima well outside any safe approach lanes/surfaces.

An important aspect here is that aircraft equipment does NOT have failure indications when a reliable signal is lost or ADF equipment fails. The only indication is the identification Morse code signal. (In this case I checked the signal; there was no longer any coding). In a recent letter to schools Flight Examiners recommended that before descending on the final Approach Segment of an ILS/NDB a further check of coding should be made. In the case of an NDB approach (and in this case) this may not be enough. In the 'old days' pilots would continuously monitor coding throughout the approach by setting the ADF volume to a low background setting - perhaps this is the minimum that pilots should do on NDB approaches?

In this case there were other indications that could have helped, such as the VOR bearing (in this case, the VOR and the NDB are co-located) and maintaining a 3D mental plot.

The controller indicated that a momentary signal loss may have occurred but a warning system alerts controllers if ground equipment fails. Reliable ADF indications were not restored for at least three minutes but were strong and reliable thereafter.

So where was the fault? Who knows!

As the reporter notes, the importance of either monitoring the Ident coding throughout the NDB approach, as many experienced pilots still do, or alternatively to check the coding at regular intervals, cannot be overstated.

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