**Tim:** 0:07

Welcome, everyone to the Civil Aviation Safety Authority podcast series. This series explores a whole variety of air safety-related topics, with hints and tips helpful for our everyday flying. I'm Tim Penney and joining me is Lea Vesic as your host.

**Lea:** 0:25

You will hear interesting stories from our industry, including pilots and aviation experts, aviators such as yourself involved in different areas of aviation who are willing to share their stories and experiences so we can all learn from each other.

**Tim:** 0:38

And whether we fly three times a week or three times a year, it doesn't really matter. There's always something we can learn to ensure optimal safety. For more information on a wide range of safety issues, visit our website www.casa.gov.au/pilots.

**Lea:** 0:55

Pilot decision-making during hazards and emergencies is the key to survival and these decisions are related to pre-flight preparation. Every day, pilots implement the rules, responsibilities and safety checks for flying. But emergencies still happen, and it's our additional responsibility to learn from them. In this episode, you'll discover how preparation helps us fly at our best, prepare for the worst and maximize our chance at the best outcome in emergency situations.

**Alex:** 1:35

I was fortunate to grow up in Switzerland with some ex-pat parents. And my godfather worked for Swiss Air. And so we would spend a lot of time at Zurich airport. And my earliest memory is the linoleum floors with those little rivets that you might know that I'm talking about where the trolleys run over them and make the little rubbery noise.

**Lea:** 1:58

This is Alexander Robinson. He's the Director of Aviation and Defense at Seeing Machines. He's a passionate aviator and has found himself in some hairy situations as a result of inadequate planning.

**Alex:** 2:10

And I'd remember that sound, I'd remember the smell. And I'd remember the clickety-clack of the old school flight boards and against the backdrop of all that was the smell of jet fuel. And that memory just permeates where I just have this earliest recollection of being around the aircraft and seeing my godfather, who looked after catering for Swiss Air and having a couple of opportunities to go in the aircraft, to be close to them, to even sit in the cockpit.

And I think that's what started my love of aviation. Moving to Australia when I was 12, one of my school friends, his dad actually owned General Flying Services, which many listeners would probably remember. And being friends with him was a great opportunity to hang around the Flying School, occasionally go for a fly. Ross Carentan let me fly with him under supervision a couple of times.

And then I would go and work for him during the school holidays, helping clean aircraft, helping gap spark plugs and things like that. So, I was around aviation as a school kid. And then that matured or fostered into a want to be a pilot. And I thought pretty hard about what sort of pilot I wanted to be when I was at school, I looked at Embry Riddle as an example to try to learn to fly and go into a commercial pilot career.

**Lea:** 3:31

Which is an American institution…

**Alex:** 3:33

That's right, yeah, in Florida. And I've got my mom to thank for that, she really encouraged me to look at the civilian side. Because from her perspective, the alternative was the military. And my perspective was highly influenced by Top Gun, I'm sure. But that military flying was the pinnacle of a career in aviation, it was the ultimate challenge.

And so I set myself a goal pretty early at school probably in year 10 or 11. And so, that manifested into joining the Air Force in 2003, spent three years at Adva. Then, went to pilot training, flying CT/4s in Tamworth, followed by PC-9s in Perth. The problem was I didn't want it enough. I wanted to be an Air Force pilot because I thought an Air Force pilot was the ultimate challenge and a cool job.

I didn't want to be an Air Force pilot for the right reasons. So, I didn't study as hard as I could have. I failed some flights and ultimately I didn't succeed in achieving my wings. That was really hard for me at the time even though I didn't want it enough. That didn't mean that I still hadn't tried really hard to get it.

And what that sort of resulted in was I was really, really sad when I didn't get my wings. I took a lot of time out from aviation. I actually spent 10 years between my last flight in the PC-9 and my next flight in a Warrior and I went and did something completely different. I worked for Caterpillar, I stayed away from aviation.

But about eight years into Caterpillar, I missed aviation. And I tried to find a way to come back to it. And I'm really glad I did it that way because I came back on my terms, I started flying again, the way I wanted to fly. I enjoyed it. And so that manifested in, in co-founding Early, an aviation startup, which got me back into aviation. I started flying again, thanks to the encouragement of my partner. And now I work for Seeing Machines in an aviation capacity. And I get to speak to pilots and aviation professionals from all domains. And I fly.

**Lea:** 5:36

Very fascinating story. And it just goes to show that there's so many different avenues in aviation that you can take. Well, today you're here to share a story that hopefully some of our listeners can take away some of your insights and learn from them. Can you start off by telling us what was the pre-flight plan for this particular flight?

**Alex:** 5:58

So, the flight that I actually thought I'd reflect on was one of my Air Force flights. So, it was a PC-9 out of Perth or out of Pearce. The flight was called the Advanced Handling Test, which was about halfway through the course. And it was as you start to go from transitioning onto the PC-9 and learning how to fly the PC-9, to learning how to operate it as a platform. So, some of the advanced maneuvers, some more difficult mission profiles, and the curriculum is pretty clearly defined for the Advanced Handling Test, you've got a senior examiner in the backseat and me as the pilot in the front seat being assessed.

6:39

So, with the curriculum known, one of the key things was to do a practice forced landing, which every pilot has done in getting their PPL, RPL, CPL, et cetera. PC-9 was no different even though it's got an ejection seat. We still don't want to throw away a jet if we don't have to. So, I knew that there was going to be a PFL, practice forced landing in the flight. And everyone, all my classmates debriefed each other on what you can expect, which examiners are typical, typically giving it, when, so you're kind of trying to game the system a bit even though it's still a core competency.

7:19

So I took off out of Pearce, was flying to a regional aerodrome called JinJin, which was about a 15-minute flight away, probably 25-30 miles. And I was expecting a PFL on the way, now on a previous flight, an instructor had shown me a dirt airstrip halfway between Pearce and JinJin, so, about 15 miles away that was suitable for a forced landing if need be.

7:43

And he'd shown me it once, and I knew that it was probably somewhere on my right as I was flying towards JinJin. And then all of a sudden, I felt the throttle go to idle, the instructor had pulled it back and said, "Practice", which meant, okay, we're doing a forced landing now. I was at about 3,000 feet. And actually, I was about 4,000 feet and I was looking for this aerodrome, I thought, "Okay, I've got my plan", which is that there is an aerodrome directly below me to my right, that I knew based on where I was, should be there.

8:13

JinJin was about 10 miles away. So, I start doing an orbit at 4,000, expecting to see this aerodrome, and it's nowhere, I couldn't find it. Even though I'm looking at my map, I'm looking at where I was, and I knew it should be there. So, I do one orbit, I do two orbits, by now I'm probably about 2,500 and I go, "Okay, I'm now at a high key height for a practice forced landing, I can't find this aerodrome I need to go to JinJin."

8:40

There are some criteria that we had to meet to pass the Advanced Handling Test and to successfully conduct a forced landing, which is to hit high key at 2,500 and to hit low key at 1,500. And if you don't do either of those, you are likely to fail. So, I didn't hit the high key at 2,500 but continued to proceed because I could see the threshold, I could see that I was likely to make it and I'd like it to continue and I probably verbalized this, but not very clearly. Passing about 1100 I reached the threshold or abeam the threshold, so I was 400 feet below low key, again, that should have been criteria to simulate an ejection and abort the forced landing. But I liked it to continue.

9:25

Air traffic controller buzzing in my ear, saying, "What are your intentions, is you gear down, etc..." And I had configured for landing and I've done all my checks. But the key parts were I was below, high key and I was below low key as I turned on to base and then final. Now, I made the landing. and so, continued the flight and then landed back at Pearce and was told I failed that flight because of that very early error in not hitting high key and low key.

10:10

And I was quite annoyed about that because I felt that I had done the right things in saving the jet and treating it as a real-world emergency. But I hadn't met a couple of procedural requirements. The lesson in that was two-parts. One was, I didn't verbalize this to the instructor. And I've always found verbalizing when I'm under mental load quite difficult because you're focused on flying the aircraft.

10:37

But the Air Force typically requires you to communicate back to the instructor because they can't read your thoughts and they can't necessarily see what you're doing. So, I didn't verbalize that. But even though that was 12 years ago now, and you know, I've put the Air Force not working out for me behind me, I still really liked that lesson, because it shows me that there is a difference between real world and planning.

10:59

And, you know, I had a plan, which was to find that dirt strip, I didn't find it, I had to adapt my plan. I didn't meet some of the procedures, but I saved the aircraft. And I think that what that taught me is I should have had a better plan for if I didn't spot that airfield. And so now what I try to bring from that is when I go flying in a Cessna, when I go flying with a friend, not the first order of planning, but what are the second and third order possibilities that could happen and how can I go through a mental exercise of planning for them, because I think if you plan for them, if you think about them, if you chair-fly them, then you're far more likely to be successful when you go into that situation.

**Lea:** 11:41

So a lot of what you're saying there is around that decision-making element coupling with having that situational awareness to reevaluate in a dynamic environment. So, how do you think that that experience has changed the way that you make decisions, particularly in flight and when you're looking at deviating from a flight plan?

**Alex:** 12:00

What that experience has taught me is that I need to be thinking before something happens about where I need to make a decision. And what I mean by that is, before I get to an aerodrome, or before I'm on final approach, at an aerodrome, I need to be thinking well before about when do I need to have a firm rule in my head about aborting this plan of action that I have.

So, you know, an example recently was I went flying with my dad at the end of last year. And we flew into Lakes Entrance and Lakes Entrance is a dirt strip. And I'd been thinking about this dirt strip for a while. So, I called up beforehand, to make sure that the airstrip was in good condition, the operator gave me a 50-50. They said it's a bit wet, but it's had aircraft landing. So, already, that was a warning sign for me, that I needed to be mindful, as I'm flying overhead Lakes Entrance to have a look at the airstrip closely.

As I entered the circuit to be very mindful about if I need to exit, what my plan will be, throughout that, so not just on descent into downwind and base and final, but right through to late final, right through to if I do land, what should I do if we start getting bogged down? We did land, it was a successful approach. But the lesson from that was that I had started thinking about that even before I took off. And then I was continually adapting that plan as we were flying, and I was trying to brief dad on what I was thinking so that he wasn't going to be alarmed.

**Lea:** 13:40

So, there's a lot of chair-flying that you could do before you actually get in an aircraft and really visualize the flight and run through what your options are. And it sounds like that's something you did quite often in the Air Force through your training. And now you've taken that through to your general aviation and private flying as well.

**Alex:** 13:59

Yeah, chair-flying is a really good case study or a thing to discuss, concept to discuss, chair flying is a good concept to discuss. Because I found chair flying really difficult, I found it quite boring. And before I even, you know, denigrate chair flying, I know that there were benefits to it. I know why it's mentally and from a preparation perspective, so valuable.

But I find it really challenging to chair fly because I feel like if you're doing it in real time, it's tremendously inefficient. Having said that, I've tried to now find ways that I can make chair flying work for me. And that's not necessarily sitting in a chair, going through the checklists and motions, but trying to find those key moments where a plan might need to change or there's some new information or something that won't work or it's a critical phase of flight. And I'll try to really just focus on those areas and think through them and verbalize them and write them down so that works for me. It's a way that I've found works better than chair flying from pre-start to shut down.

**Tim:** 15:04

CASA hosts a range of resources and events to support the pilot community. Register to attend our free AvSafety seminars, to hear about safety issues, talk to us and meet other people in industry. Visit www.casa.gov.au/AvSafety to register. And while you're there, subscribe to the mailing list to stay up to date on changes and information relating to aviation safety resources for all pilots.

**Lea:** 15:32

There is no doubt that pre-flight planning and preparation reduces the pressure and decision-making loads when hazards or emergencies unfold. Let's unpack preparation and the steps to safe flying with an industry expert.

**Terry:** 15:54

From our perspective, really, the flight is a whole number of things that you've got to get done. And I guess if you have a look at the VFRG, we've got chapter two, which is planning your flight, it's actually got 125 pages to get through for pre-flight planning. And that tells you the importance of actually thinking about your flight before you actually undertake it.

**Lea:** 16:17

This is Terry Horsam, who is an Aviation Safety Advisor at CASA, he's been a professional pilot for 35 years, has flown many regional airlines and has a keen interest in the human factors of flying. He's here to share with us some of the common mistakes made in pre-flight planning, and how you can best plan your next flight to ensure it's safe and smooth.

**Terry:** 16:38

Most people would look at the weather as being the most important one, and quite rightly so because a lot of accidents occur for pilots who have not planned because of weather. But there's a lot more to it than just that, you know, we need to sort of plan all the way through, we have to look at contingencies, etc. So, there's a whole gamut of things and that 125 pages is probably just the beginning of the things that you should be thinking about before you get into an aircraft and go for a flight.

**Lea:** 17:07

And what are some common mistakes pilots make when they are pre-flight planning?

**Terry:** 17:12

I think the common mistakes are just to concentrate on the one thing and again, if we come back to the weather, you know, they'll have a look out the window, as you've just quite rightly said, and they'll go well, it's a nice day. So, off we go. And, you know, they may think that there's no need to look at the weather in their destination, they might think that it's going to be fine all the way through. But I like to sort of refer back to the PAVE model for pre-flight checklist.

17:41

And that refers to things like the pilot, so it's really sort of pre-flighting yourself. So, a lot of pilots forget to actually check on themselves to make sure that they are fit to fly. And if we're recreational pilots, you know, a lot of the time we don't actually have to go flying, we might be doing it just for fun, or we might be taking friends for a flight.

17:59

But if you're not 100%, you know, you've got to check yourself out to make sure you're fit to fly, you might use the I'M SAFE Checklist, which is also a great one to sort of check on the illnesses and any medications that you might be taking. But additionally to that, of course, you need to make sure that you're competent on the aircraft you're about to fly, that you're current, that you are not going to exceed your personal limitations.

18:23

And by that I mean if you haven't done crosswinds for a while, have a look at the forecast. If the crosswind at your destination or your departure airfield is in excess of what you think you can handle, then that would be a good reason not to go flying. The second part of the PAVE checklist is in fact the aircraft. And on the aircraft, you're looking at things like airworthiness. And I guess over the last couple of years, things may have slipped on aeroplane maintenance.

18:50

And so you might be looking at a maintenance release. And you might have some outstanding items to be fixed by the engineers, they may have slipped for some reason. Or it could be that the maintenance release itself is out of date. This is all part of planning. So, you're looking at the aircraft side of it, the airworthiness side of it. On the airworthiness side, you're also looking at the fuel. We've already done a fuel plan. But sometimes people forget that, you know, you've got to have that physical fuel on board as well. And that's the sort of stuff that you know, you're planning, yes, it's great to plan, but you've also got to check that that's there.

19:24

The V is a little bit of a stretch, it's environment. And so you're looking at where you're going flying. And the fact that you're going to an airport, you might be familiar with that airport. But it could be that on this particular day you check the NOTAMs and you find that a cross-strip is closed or something like that. And finally, the E in the PAVE checklist is the external pressures. Is there anything that you can think of that is going to affect your flight today?

19:50

So, you know, is there something happening at home that you might sort of think well, this is going to affect the way I feel about my flying today. Any number of external pressures or stresses can affect the way we fly as well. So, I think that's part of your pre-flight. And a lot of people just sort of concentrate on the one thing, they think, "Oh, the weather's fine, let's jump in and go." But there's a whole gamut of things that you've got to cover off on.

**Lea:** 20:12

You've raised some really good points there, particularly with that PAVE model. Acronyms is something pilots are very used to using and memorizing and in flight planning, I think that's a really good one to have on hand. How important is it to document a flight plan even if you're flying to somewhere that you're familiar with or that you've flown to quite a number of times, is it worth still going through that process?

**Terry:** 20:39

Absolutely. A lot of pilots forget the fact that a flight plan is necessary. If you're going beyond 50 nautical miles, you really want to have something in place to ensure that you're doing your fuel calculations correctly, that you've covered the alternate requirements, a lot of people forget about alternate requirements, could be that you're only going on a short flight that you've been on numerous times before.

And it might be 100 miles, for instance. And you get to the point where, when we're aviation safety advisors, we go out and ask people if they know what the requirements are for alternates as a VFR flight, most of them don't realize that, if you've got a forecast that's below an alternate minimum of 1500 feet ceiling and eight kilometres flight visibility, you've actually got to cover off on a destination alternate, you've got to have somewhere else to go.

So, even though you might be doing a flight that you've done numerous times before, it's necessary to have a look at that sort of stuff. Now, when it comes to lodging a flight plan, not everybody would go through the full extent of lodging a flight plan. But as a bare minimum, you might consider using a flight note. And if you go on the AMSA, the Australian Maritime Safety Authority website, they recommend using flight notes. And a flight note is essentially just letting somebody who you trust know that you're going flying, that you expect to be back at a certain time. And if you're not back, then make sure that they understand that they need to ring the AMSA number.

Now, might sound a bit strange having Maritime Safety Authority, but they're the people that will pick up on your ELT, your beacon, and they're the ones that will go looking for you. So, even just things like just a shortage of sort of flight, let somebody know that you're going flying. So, if anything does go awry, or even if you just land precautionary somewhere, they can contact you. And that way, it saves a lot of people a lot of angst, particularly if they have to go looking for you. So, this is particularly important in places like designated remote areas, where a lot of people forget that there are designated remote areas in Australia, and I think half of Tasmania is designated remote area. And you need to really think about your flying in those particular areas.

**Lea:** 22:53

Yeah, and that's a great point, particularly when we're talking about having backups on board as well, I think we're seeing a growing number of pilots, relying largely if not solely on EFBs for flight planning, whether it's pre-flight planning or en route. And as we know devices, like with all technology can fail on us, and particularly when we're in remote areas of Australia. So, what are some of the risks in doing so, in relying on one type of electronic flight plan? And what legal requirements should pilots be aware of if they're doing so?

**Terry:** 23:28

Okay, so the EFB is a great addition to our flying, it's something that's sort of come across in the last, you know, five or so years, where we find that the majority of people will probably use electronic flight bags in the aircraft. Now, as a substitute for your normal maps, etc, they're fine, but you have to have a backup, there are differences if you're a commercial operator. So, if for instance, you jump into an aircraft and go for a scenic flight around the Great Ocean Road, or something like that, you might find that your pilot will be using an iPad.

But those commercial operators will have all the policies and procedures for use of that iPad in their operations manuals. So, there's different rules for them as opposed to a private pilot. So, the rules for a private pilot are yes, use them, make sure you've got a backup. But also remember that it's rubbish in, rubbish out when it comes to those things. So, you know, there's a lot of responsibility on you, understanding what you're putting into that electronic flight bag, because they are dumb and dutiful.

They'll do exactly what you've asked them to do. But essentially, as I say, rubbish in, rubbish out, so they're the sorts of things that I'd definitely be aware of for pilots, and we're all for them. They're a great addition to your situational awareness. They've got some great features, but be aware that if they do stop, you know, they if you leave them on the combing of the aircraft, they'll soon stop working once the temperature picks up, you've got to have a backup, you've got to be able to at least know where you are.

And I think there'll be a few pilots out there that have possibly been on flight reviews recently where they've had an overreliance on that flight bag. And the instructor said, "Okay, it's not working, where are we?" So, you've still got to know where you are, you've still got to know the basics. So, don't throw the basics out because you've got this really great bit of kit. As I say they're really good, we love them. But they also come with the caveat that you've always got to have the backup, and you've got to know what you're doing, where you are with them.

**Lea:** 25:41

Technology certainly is helping pilots to fly better, and more accurately, but you're right, it's rubbish in, rubbish out. And I think that's a key takeaway, at least in terms of understanding not only the aircraft and the systems on the aircraft, but the systems that pilots use as well, like EFBs, it's critical in using them appropriately. It's one resource and there's obviously many that pilots use. CASA also produces flight planning resources, can you talk a bit about them and why pilots should get on to the CASA Online Store and download some of those resources?

**Terry:** 26:19

Absolutely. I've already referred to the VFRG. And that should be, that is like the pilots' Bible. That's a really highly well-produced resource for pilots to have a look at. And as I mentioned, there's 125 pages just on flight planning, but it's also got all the other regulations as well there. Now you can buy a hard copy of that. And that's my preference, having sort of been around for a while, I like to have a book that I can open and leave open at a certain page.

But that resource is also available in PDF form online. So, the VFRG is absolutely one of the basics. The other thing that CASA does really well is we have a flight planning kit. And that kit includes a number of I guess you'd call them decoding cards for things like weather forecasts from the BoM, it's got some flight plan pads in there, it's got a small ruler, again, sort of taking you back to the basics.

There's a number of things there that CASA puts out. And it's available from the online store as you mentioned, you can order any number of things from the store, and you just pay the $15 delivery fee. But it's really well-worth having a look at the kit, we always recommend it to people who are just embarking on their navigation training. But we also would say, look, even if you've been flying for a while, get your hands on one of these kits and just see what's there. There's some really good information in there.

**Lea:** 27:41

Now we've heard key insights from Terry, let's circle back to Alex and hear what lessons he's learned during his time as an aviator.

**Alex:** 27:49

I was lucky to have learned to fly in a very structured, progressive and highly competent environment being in the Air Force. It's certainly not to say that civilian flying schools or the way that non-military pilots learn to fly, don't have that same structure or quality of training. But for me, the lessons I learned during military pilot training are still relevant today, particularly around preparation, briefing and debriefing.

So, I still try to adhere to those elements by being as well-prepared as possible by briefing myself before flying. And by spending a significant amount of time debriefing in a way that works for me, I no longer have the benefit of that structured environment and that lesson structure that worked so well for me. So, I need to try to take elements that I remember from the Air Force, and bring them over to my personal preparation.

**Lea:** 28:47

Now, let's hear some final thoughts from Terry.

**Terry:** 28:51

One of the big things that people tend to forget is last light, and we've got a requirement that you've planned to land 10 minutes before last light, that's the ruling. But, you know, if you've got a flight of an hour, it's not too difficult to lose 10 minutes en route, maybe, you know, diverting around some cloud or whatever it might be. So, 10 minutes is not a great buffer. So, my tip would be for people, particularly with last light, make sure you do consider it, consider the terrain that you're flying into. If there's high terrain to the west of your airfield, you will find that last light will occur earlier than what you might have calculated.

And a lot of people do get caught out with that. It's part of your flight planning, but give yourself a reasonable buffer with last light. Don't just accept the fact that I'm going to get there 10 minutes before and everything's going to be fine. Give yourself that buffer. So, the weather might be great. I can guarantee that it always gets dark when it gets dark, it has done in my lifetime anyway. So, don't think the daylight is going to extend because it won't and as I say don't just concentrate on the weather side of it and just accept the fact that it's a nice day.

You know, that's how we get complacent, to think about all the other aspects of flight planning, pre-flight planning, it's essential. And I think there's a truism out there in aviation that truisms normally come about because something's happened. And we all know that Proper Preparation Prevents Poor Performance. And that's something that I think is something that we should all remember.

**Lea:** 30:25

If you want to learn more about how you can stay up to date on the topics we've discussed today, check out the information and resources by going to the link in the description. Thank you to our guests for sharing their wisdom, stories and insight. We look forward to having you join us for our next episode. My name is Lea and this is the AvSafety podcast.