School's **out**

With daylight fading a student pilot fights in vain to find his way home.

By Jim Contos

I HAD JUST returned from a dual training flight with Dave, the chief flying instructor. The flight had gone well and he suggested I do some solo practice on steep and limit turns and stalls before last light.

I was seventeen years old and I had accumulated a grand total of 20 flying hours.

At 4.45pm, with checks completed, I willingly launched from our home-base airport – a bush strip in the central wheat belt region of Western Australia – and climbed to 4,000ft.

The air was beautifully smooth and my eager little Cherokee locked easily into the 60° steep turn groove – left and right.

This was fun. I marvelled at the way the stubby little wing pirouetted on the patchwork quilt of freshly ploughed paddocks below.

Rolling out of a turn, I became aware that the light was fading and it was time to return home. I scanned the surrounding terrain and identified Northan, which was about five miles to the west. Five miles to the north of the town, I could see the strip. I pointed the nose at the strip, gave an all-stations call, eased the control column forward and started a long shallow descent to 2,060ft to join the circuit.

I was several minutes along my inbound track when it struck me. "The town" I had spotted was in fact a salt lake.

I threw the aircraft into a steep turn and scoured the countryside for something familiar but couldn't make the match I was desperate for.

In my zeal, I had not kept a sufficient look-out and had drifted out of the familiar training area.

In spite of my brain feeling numb, I quickly settled on three main points.

One, I had no idea of where I was. Two, a corollary of the first, I did not have a strip to land on, and, three, light was fading fast.

I had no experience outside of a series of neatly defined and predictable air exercises. I was 2000 feet above the ground and felt I might die.

In the murky distance, I made out the

dark grey form of wheat silos. Beauty! Overfly the town, identify it, and follow the pipeline home. There's enough light to do a landing.

I was soon over the small town and its beacon silo. I rolled into a steep turn to try to identify it. The wing interrogated the townscape as I frantically tried to pick out the detail that would put me back in the comfort zone.

Yes! I soon identified the town as Meckering. Throttling up a little, I converged on the pipeline that I would follow home.

"Well done!" I thought to myself feeling pretty pleased, "No worries; drama over."

In IFP (I follow pipelines) mode for some minutes, the gloomy image that began to develop in the windscreen did not match the image I was expecting. This was the wheat silo of the next town *east* of Meckering; not home!

A quick glance at that fixture above the panel, hardly used in my short 20 hours – the compass – revealed I had tracked the wrong way and had miserably failed my first navigation exercise.

A steep turn onto a westerly heading soon had me over Meckering again but my little excursion east had used valuable minutes of daylight. All I wanted to do was get back on the ground while I could see what I was doing – I would have to land in a paddock.

Precautionary search and landing was a term I had only chanced to glance at on the briefing board in the briefing shed. Executing a landing outside the skills my training had so far provided seemed akin to landing a lunar excursion module on the moon, without any training.

At about this time, the radio crackled to life. It was my instructor, Dave. He had launched a search of the training area in the club's 172. The local ag pilot, another Dave, had also rolled out his Pawnee and joined the search.

Atmospherics at that time of day, however, made intelligible VHF communication impossible. In frustration, I made a Dave-I'm-lost-and-will-try-to-land-in-a-paddock call and turned off the radio. (The two Daves subsequently landed back at the strip with the aid of vehicle headlights.)

It was now dark enough for me to think of switching on the nav lights. The unfamiliar flood of red over the instrument panel unsettled me. "My blood on the panel," I thought.

I spotted a little elongated triangle of green – the only green on the landscape – and recognised it instantly as my landing ground. I pulled the throttle and nosed toward it.

No thought of a circuit here, just get down quickly. I began what was, in effect, an *ad hoc* final. No checks, nothing; just get down!

It's a funny thing. As I was gliding over the tall gum at the end of the field, intent on putting it down at any cost, the drill, the rules – inculcated from the start – surfaced.

This is not right. Set up a circuit. Do it properly. That initial landing run became a low-level check of the area: check for traversing powerlines; clear the sheep off the landing area; identify a marked up-slope; fly over the farmhouse at the end, and; climb out for a downwind leg at 1000 feet.

It all fell into place as I completed my checks and set up a short-field approach over the gum. I was calm, measured and in control.

> **"I had no experience outside of a series of neatly defined and predictable air exercises. I was 2000 feet above the ground and felt I might die."**

Rounding out, the up-slope had me on the ground, with a bounce, much sooner than expected. Still, a good landing I thought. However, if the ground had not been so soft from the winter rains, I suspect I would have stood a good chance of bending something expensive.

The next day, the two Daves spent a long time looking for my touchdown point and inspecting the undercart and inboard wing surfaces.

After getting the nosewheel bogged several times while taxiing up the slope, Dave successfully flew the aircraft off and climbed at 65 knots from the right hand seat.

At a safe height he wrung a series of limit turns out of the little Cherokee, gave a little grin, and with his customary coolness said, "You have control, take us home."

This was to be my only out-landing on a lush green field. But I was the better for it!

The landing, a miraculous one the club newsletter reported, came about from a chain of fundamental errors borne of inexperience. But rather than unnerve me, it strengthened me and proved to be a very valuable part of my training.

ANALYSIS > THE SYSTEM WORKS

Staff writers

LIKE MOST air safety events this one involved human factors. Almost every modern accident investigation reveals a chain of events which confirm the validity of the "Reason Model of Accident Causation" – a model now used by many organisations in a wide range of industries, as the basis of their risk assessment and risk management (safety) systems.

Professor James Reason's philosophy is based on understanding, evaluating and managing the relationships between the events leading up to a safety occurrence; the individual (or team) actions that led to it; local factors such as weather, visibility, communications, and navigation aid availability; organisational factors relating to crew, operator and regulator; and the presence, management and effectiveness of system defences.

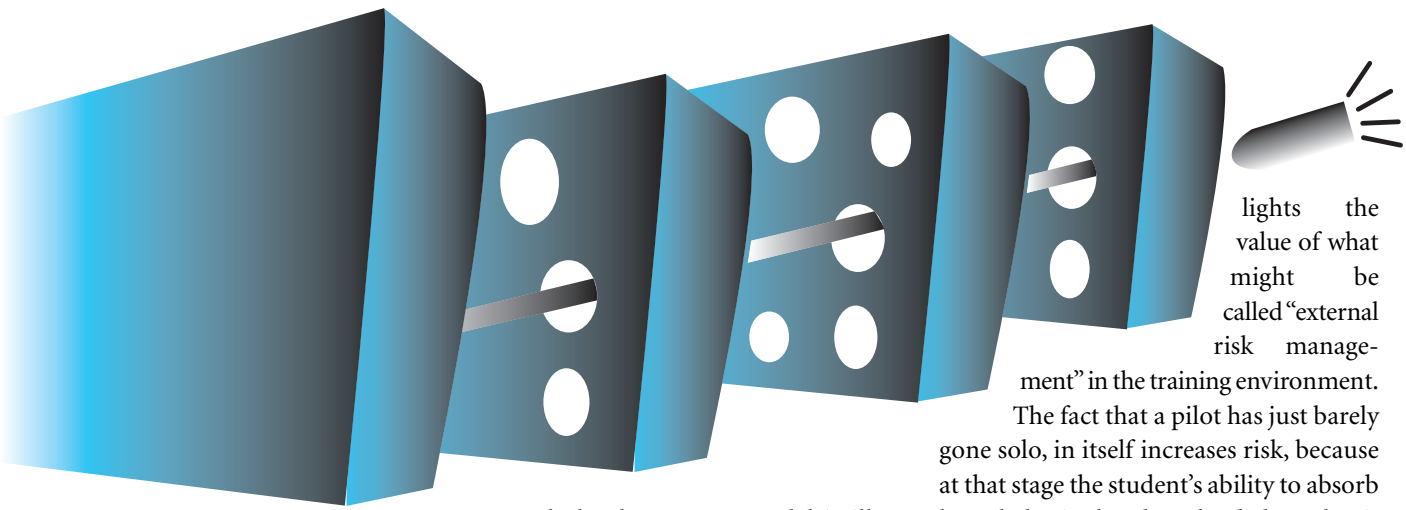
Reason uses four terms to distinguish between the various direct causes of accidents, and those which are embedded in the system of the organisation.

Active failures: Actions or incidents which cause the event. These might include errors, deliberate violations of safety regulations or accepted practices, equipment failures, or conditions in the natural environment.

Latent conditions: Deficiencies in the organisational environment which create an operational situation in which the probability of active failures being triggered is increased – such as an inadvertent failure to develop and monitor a system to avoid such an event.

Defensive failures: Deficiencies in the procedures of the organisation which mean that it does not adequately scan activities in order to identify and remedy errors and violations before they produce adverse safety consequences. These are frequently the result of organisational pathogens.

Organisational pathogens: Core systemic failures which allow latent failures to develop, defensive failures to break down, and active failures to occur unchecked.



Popularly, the Reason Model is illustrated by identically-sized discs revolving around the same axis. Each disc represents one of the elements of the safety system, and failures are represented by holes in the discs, each being an active or passive failure of the accident prevention system.

The theory postulates that somebody is firing bullets (potential accidents) at the discs, but that an accident will only occur if the bullet is fired at the very moment when (and if) the holes line up and all the defences are breached.

The outcome of this incident shows that the flying school had in fact looked ahead at what active or latent failures might occur in the training environment, where pilots with relatively little experience may face an emergency.

An active failure – an error - occurred when the relatively inexperienced pilot's enthusiasm led him to lose track of time; and another occurred when he made a navigation error.

But (as with most flying schools), being aware that the student's base knowledge and situational awareness is likely still to be developing, the instructors had put in place at least two relevant defences against assessed risk. They had taught their students how to get home if they were lost, using the wheat silos, as well as training them pre-solo to carry out forced and precautionary landings in a contingency.

The event the pilot has outlined highlights the value of what might be called "external risk management" in the training environment.

The fact that a pilot has just barely gone solo, in itself increases risk, because at that stage the student's ability to absorb knowledge is already so loaded-up that it is difficult to train for every contingency that might be encountered.

But the defences worked, and the safety outcome was the prevention of a potentially fatal accident.

It is educational for any pilot, instructor or flight school manager to read this pilot's account of events and examine it against the Reason Model.

Put yourself in the position of any CFI or flying school manager. What active failures might trigger such an event? What latent and unidentified failures may exist? What gaps in defences may result in a similar close encounter with disaster? Are there systemic organisational failures and deficiencies that may result in a failure to identify existing risks and to erect defences against them?

This event is a classic example of how effective defences can save the day.