

Expect the Unexpected: Evidence-Based Training

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Today's aviation environment is complex but **incredibly reliable**. Our aircraft are packed full of automation, systems and redundancies designed to keep us safe up there. Fancy things like EGPWS, Flight Envelope Protection and TCAS are there to protect us.

But herein lies the issue: because things are so reliable, the circumstances of the next accident waiting to happen are ever more challenging to predict.

All that technology is still **limited by us humans**. One thing we do know is that human factors have played a role in between 70 and 80% of airline accidents and serious incidents over the past thirty years. In many cases these accidents have certain things in common – poor group decision making, ineffective communication, inadequate leadership and poor flight deck management.

So it is clear we have an important role to play in making *ourselves* more reliable too.

Enter 'Evidence Based Training' or simply EBT for those in the know. And it's a **revolution** for pilot training.

What is it in a nutshell?

In really simple terms it is about looking at data or 'evidence' to find relevant threats and errors and then changing the way we train pilots so they have the competencies they need to deal with them.

Cool, so what does that actually mean? Let's delve into things a little more.

Out with the old

Traditional airline training was based simply on events that occurred on early generation jet aircraft from yester-year. There was a belief that simply exposing crew to those same '**worst-case**' scenarios over

and over again would be enough.

The **cyclic** was born. A long list of bad things that can happen which you'd periodically face in the sim. They tended to be manoeuvre based – you know the ones. V1 cuts, rejected take offs, go-arounds. As long as you flew them within limits you were officially 'competent.'

It was simply a tick-in-the-box approach to pilot training. But you couldn't help but get a nagging feeling the industry was missing the point: **you have no way to predict what will actually happen to you** when you go to work the next day.

Modern aviation has a way of throwing things at us that we **haven't seen before**. Computer failures, mode confusion, strange stuff. Just look at the tragic case of Air France 447. Training in modern fly-by-wire aircraft has never been the same but it sadly came to late for that particular crew.



Both competent crews but can you think of unique scenarios the crew on the right may have to face compared to the crew on the left?

In with the new

Over time the amount of data or evidence out there improved dramatically. **There were a bunch more sources** – flight data, LOSA programs and air safety reports to name a few.

In 2007, a new industry-wide safety initiative emerged. It was led by IATA and began to use this evidence to identify relevant threat and errors that crews face for their particular operation and adjust training to better equip crew to deal with them. **EBT was born**. ICAO was sold on the idea too and hopped onboard in 2013.

The emphasis is on **crew effectiveness** as a whole by developing a bunch of competencies – tools that pilots can use in any scenario, normal or abnormal. The training uses **unscripted situations** to develop crew management strategies, techniques and human factors that are just as important to safe flight as technical skills.

Here is an example of the sorts of competencies that EBT training sessions look to develop (it really is the whole package):

- Application of Procedures
- Communication

- Aircraft Flight Path Management, including manual flying
- Leadership and Teamwork
- Problem Solving and Decision Making
- Situational Awareness
- Workload Management
- Knowledge

Isn't that just Crew Resource Management?

Not really. Although CRM continues to be a solid step forward for the industry, when put into startling or surprising situations studies have shown we lack the capacity to immediately control our behaviour. What we need is practical training over time with **consistency and reinforcement** which is where EBT becomes so valuable.

It combines both technical and non-technical skills and focuses on the crew as a team, achieving successful outcomes when faced with the unexpected. **It moves the emphasis away from checking and more toward training.**



After a single engine failure the crew of QF32 were faced with 43 different failure messages in the first sixty seconds.

So how does this all work in the sim?

Good news, EBT doesn't mean you'll be in the sim more often. They'll still pop up on a biannual basis. What will change is how the sessions are run.

EBT sessions are typically broken into two or three parts:

An Evaluation – this is where your baseline performance is measured. You'll be given scenarios you may face in your own operation. This is so your trainer can get a good look at you in action and begin to identify your own personal areas of weakness that they can work on in subsequent sessions.

Proficiency Training– this is mostly manoeuvre based stuff you're used to. Your trainer will focus on your technique. You'll be put under pressure but the idea is to further develop your abilities in challenging circumstances. Your standard currency items will also be ticked off.

Scenario Based Training – this is the heart of EBT and where most of the work is done. The focus is on event management and the scenarios are off the script. You pretty much won't know what is coming but you'll have to apply your knowledge, skills and attitudes to a successful outcome. It is a journey of self-discovery in solving problems rather than simply following SOPs.

Over time these competencies will be reinforced – giving you the confidence in your own abilities to tackle whatever is thrown at you.

After all isn't that how the **real world** works out there?



Expect the unexpected in the sim. It is not as bad you think...

Other things to read

EBT is fast becoming an industry standard and many operators have have their new **training programs** up and running. For those that haven't, here are two things you need to get started:

- The IATA Evidence-Based Training Implementation Guide.
- And for the brave, ICAO Doc 9995 Manual of Evidence-Based Training.

EBT looks at **pilot competencies** – a set of ‘tools’ for a pilot to quickly draw out of their metaphorical tool belt in order to help them solve whatever situation flies their way. The **Decision Making & Problem Solving** ‘competency’ is a big, multi-faceted one, and it turns out that making a decision is often easy, but making a good one is less so. Read our article on this [here](#).

Currency and Startle Factor - How to Beat It

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Good news – the vaccine is here!

Slowly but surely passengers will begin returning to the skies. **Which means pilots will too.** Just like a huge ship, our industry has inertia. You cannot simply take your foot off the brake and straight back onto the gas.

In 2020, it went into a deep hibernation. Remember those pictures? Thousands of gleaming tails stuck depressingly in the desert? Well, pilots didn't fare much better. **Thousands of pilots were put into deep storage too.**

To give you an idea of scale, get a load of these stats- the first post-Covid worldwide survey found that **58% of the world's pilots are currently grounded.** 33% lost their jobs completely while a big bunch are on furlough with no clue when they'll fly next.

So as the industry begins to recover (and it will), a legion of seriously **“non-current” pilots** will find themselves back in the hot seat facing the same challenges they did back when things were booming and your skills were Chuck Yeager sharp.

Beginning to get the picture? I'll give you a hint...

It's not like riding a bike.

We're not machines and **our skills degrade over time** no matter how good you are.

Secondly, you might think a bunch of extra training will soon get you back to speed. The issue is **resources** – it is such a big task to get everyone current again you are likely to find yourself at the controls *legally* current, but not necessarily at your best.

So if something goes wrong, you're likely to be **further behind the 8-ball**. So let's talk about **startle factor**. Yep that old chestnut. We've all been there. Something has gone wrong and fast. One minute you're talking about that great place that does burgers near the crew hotel, the next you're seeing more red lights than Amsterdam. For a fleeting moment all that training and knowledge is gone. **You go blank but feel compelled to act**. Sadly it is in these brief moments that some crew have tragically become unstuck.

Here's the issue.

When you're not current you are more likely to fall victim to **startle factor**. And you can bet your bottom dollar that whatever is about to happen is not going to wait for you to get a few sectors under your belt first.

So if I get a call up next week, what can I do about it?

- **Understand what is happening in your brain when something goes *bang*.**

Startle factor is **normal**. It affects everyone because a 'fight or flight reflex' has been hard wired into our brains since the days we were running away from woolly mammoths and sabre tooth tigers. It is a physical and mental response to something unexpected.

When something gives us a fright, our brain activity changes. We think less and act instinctively while our bodies are pumped full of adrenaline and stress hormones. Effectively for a short time **our thought processes are hijacked**. We can get into a vicious cycle of bad decisions in a hurry. This post-startle brain fog has had tragic consequences in avoidable accidents.

- **Don't act. At least right away.**

Just for a moment, **resist the knee-jerk reaction**. Slow it down. By sitting on our hands even for a second or two you are giving your brain a chance to pass through its instinctive reaction and give you back control of your decision making. You have to understand what is actually happening before you can do anything to fix it.

- **Be Ready.**

Fight boredom and be alert. In each phase of flight think about what could go wrong and how you will react. For those less superstitious, **dare your plane to fail**. By keeping your brain in state of readiness you will overcome the startle factor more easily.

- **Get Back On the Script.**

Ah, yes. **Familiar territory** – nothing helps you get over a shock than what you already know. Use a robust decision making process and watch your ol' capacity bucket grow.

You have probably heard of some – SAFE, GRADE, FATE etc. There are lots of them but it is important to have one and **practice it consistently**.

T-DODAR is another tried and true method, and US Airways flight 1549 shows how it can be used in some of the most startling circumstances that could have been thrown at a crew.

Sully Sullenberger kicked a field goal that fateful day in 2009 when they took a flock of Geese straight through both noise-makers.

He paused, sat on his hands and tried to **understand the status of the airplane**. What had happened, and why. Whether he had power or not. He got himself back in the loop. He took control of the airplane, established it in a glide and turned the aircraft back towards the airport. He then told ATC. **Aviate, navigate, communicate.**

Once he had the capacity, he went to work. He knew he had **no time** and had to land. The **diagnosis** was obvious – a bunch of birds damaged both engines. Sully worked through his **options**: Return to La Guardia, go to another airport or ditch. He made his decision – “We’re gonna be in the Hudson.”

Once the **decision** was made, he **assigned** tasks. He would fly the plane, his First Officer would run checklists and try and get an engine back and his cabin crew would prep the cabin.

As they descended toward the river he turned to his colleague and with a simple question covered off his **review** – “Got any ideas?”. In other words, anything we haven’t tried yet? 155 people were saved by the crew’s ability to make decisions effectively. Apply a framework and you create so much extra brain space to concentrate on other things.

Oh, and about the sim.

Traditionally, airlines have followed **matrices**.

What’s that you say? Matrices, cyclics, whatchamacallits – predictable training programs that meant that every year or two that horrible multiple hydraulic failure would pop up yet again. That **canned exercise** that you were born ready for because you spent all last night studying it over a room service steak.

While I’d be the first to admit that when it comes to sim assessments, **I love to know what’s coming**, that’s not how the world works. The real reality is... who knows? There is an un-countable number of factors at play that will decide what an actual airplane is going to throw you at you. So the best defence is **being comfortable with what you don’t know**.

Spend a few minutes looking up ‘Evidence Based Training.’ Chances are you’ve already heard of it. It’s about assessing competencies no matter what’s thrown at you and it’s **a revolution for pilot training**. If you have the right tools in your bag you can fix almost anything – and that’s the whole point.

Simulator time is valuable, and if you get the chance use the extra time. **Get something new thrown at you** – because at the moment, we need all the help we can get!

Some other interesting stuff...

- IATA’s guide on Evidence Based Training

- 'Without Warning' A great article on the topic of 'Pucker Factor' from 'Down Under' (what are the odds!?).