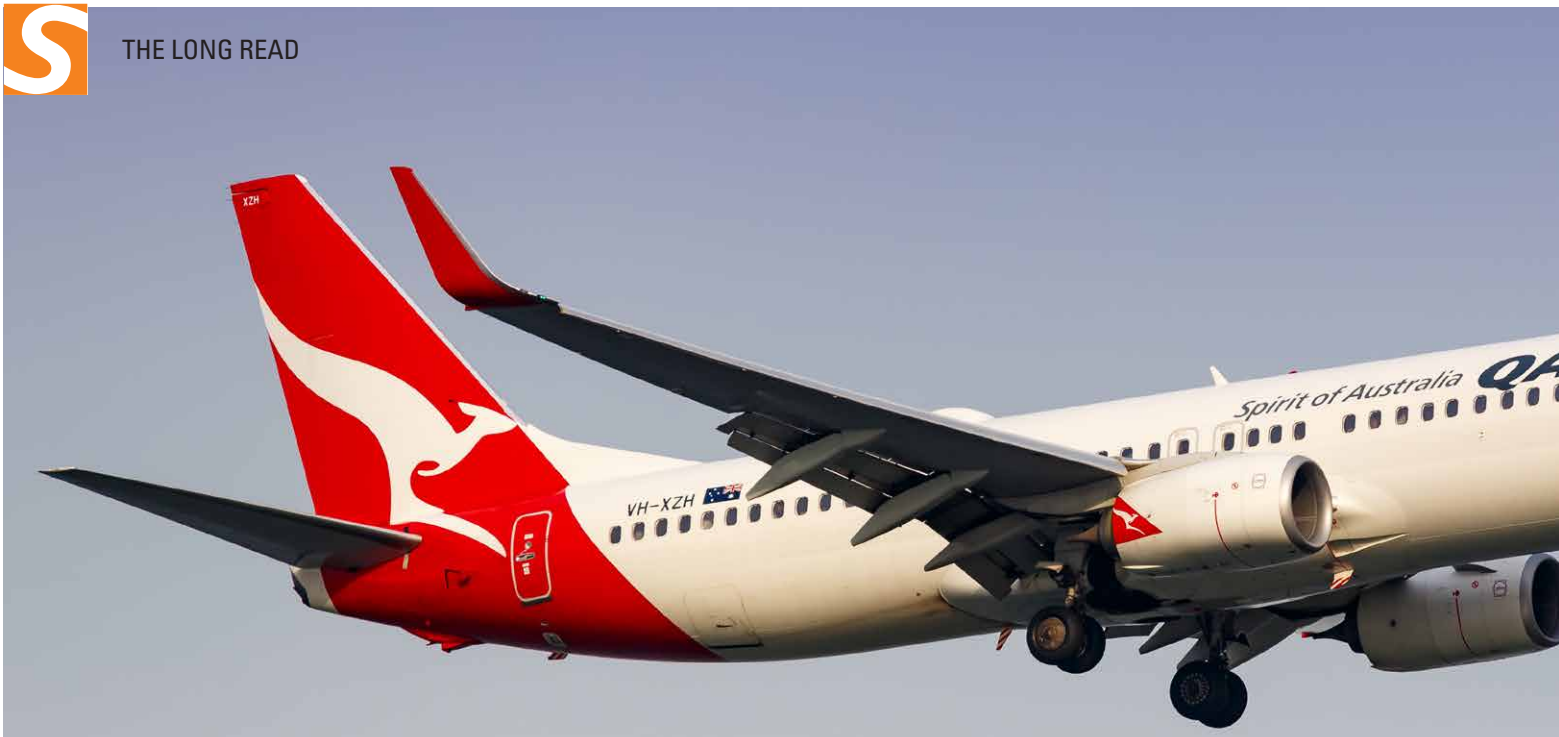


QF32 AND POST-TRAUMATIC STRESS

Most of us will experience post-traumatic stress at some point in our lives, associated with critical incidents at work or events in our personal lives. For some, this progresses to a more severe disorder. In this article, **Steven Shorrock** reports on an interview with **Captain Richard Champion de Crespigny**, on his experiences post-QF32.

"Pan, Pan, Pan, Qantas 32, engine failure, number two engine, maintaining 7,400 feet, maintaining current heading. Stand by for instructions."

While such transmissions will usually be followed by a temporary increase in stress for both pilots and air traffic controllers, they are trained to deal with such emergencies. But the engine failure of QF32 on 4th of November 2010 was on a scale that very few front-line professionals ever have to deal with. In fact, 21 out of 22 aircraft systems on the Qantas A380 were compromised, and the crew had 120 ECAM checklists to deal with (compared to four or five checklists in a typical simulator session). The crew brought the aircraft to a safe landing at Singapore.

But the stress of critical incidents doesn't end with a safe outcome. The end of a critical incident may be the beginning of another kind of stress, which can last for weeks, months, years or even decades: post-traumatic stress (PTS) and post-traumatic stress disorder (PTSD).

For the rest of the article, I'll refer to 'PTS(D)' to cover both PTS and PTSD. Post-traumatic stress (PTS) is a normal and generally adaptive response to experiencing a traumatic or stressful event, such as an accident or assault. PTS is a very common and normal condition that most people will experience multiple times during their lifetime. If symptoms persist for months or years, they may fit the diagnosis of post-traumatic stress disorder (PTSD), a clinically-diagnosed condition listed in the Diagnostic and Statistical Manual of Mental Disorders (fifth revision, May 2013). According to the National Institute of Mental Health, PTSD will affect 6.8% of U.S. adults in their lifetime. The difference between PTS and PTSD depends on a set of diagnostic criteria and a diagnosis, but PTSD often remains undiagnosed.

Having spoken to Richard for a few hours, I discovered we had a few things in common. We both grew up in family businesses. Both of our mothers died while we were in our late teens. And we had both experienced, and studied in some depth, PTS(D) (my account can be read at http://bit.ly/PTSDandme). So, I was naturally interested in Richard's experience, post-QF32, having read his accounts of it in his books *QF32* and *FLY!*

In *FLY!*, Richard noted that he knew nothing about PTS(D) when he stepped off his A380 at Singapore, but *"what happened that day affected me badly for many months"*, he wrote.

After dealing with the immediate briefings and checking on the wellbeing of passengers and crew, he attempted to return home as a passenger with the other pilots to Sydney. That B747 flight was forced to return to Singapore after another engine failure. He finally arrived home after another day of delay. The following morning, he woke feeling wretched, and was soon in the bathroom, physically unwell.

I asked Richard when he first become aware of the signs of PTS. *"It was five days afterwards when I attended an interview at the Australian Transport Safety Bureau. They said, 'Tell us what happened when you left the hotel and for the rest of the flight.'"* The ATSB had allocated about 20 minutes to hear Richard explain what happened. It took four hours.

Richard got to the point in the story 12 minutes after the engine failure when he decided to climb to 10,000 feet and remain inside 30 miles to mitigate for an all-engine out approach to Singapore – what he calls an 'Armstrong Spiral'. He decided on this action after being overloaded by all the failures that affected QF32. Complexity overwhelmed his senses and thinking. He was unable to maintain his mental model of the aircraft, its many failures and the knock-on effects that created additional failures.

That was a point of maximum stress. *"I was trying to describe the failures to the ATSB,"* said Richard, *"but recalling my memories put me back into the cockpit reexperiencing this avalanche of stresses. My emotions became overloaded and at that point I broke down and cried."* Five days after the crisis, the act of recalling the original situation triggered the PTS. *"That was the first time I realised I was in trouble".* He wrote in *FLY!*, *"It was the first time I had lost my composure since my mother had died 37 years earlier, when I was 17 years old."*

For the next two weeks, every time Richard recalled that point in the flight where he had to prepare for an 'Armstrong spiral', he would start to cry. He then realised that he needed professional help.

Symptoms

Richard experienced typical symptoms of PTS, including flashbacks – perhaps the most well-known symptoms of PTS(D) in popular culture. Traumatic events are re-experienced from memory, as if you are back in the scene, triggering the emotions and often physical sensations that were present at the time. Flashbacks can involve several senses, or just one.

Of all the symptoms of PTS(D), hypervigilance, heightened startle reactions and associated 'fight-flight-freeze' states can be the most physically and mentally exhausting and debilitating.

Richard remarked that *"These stressful memories stay dormant, ready to be re-enacted when a certain sensory pattern of events arrives at the brain. It could be a sound, a smell, a taste. These memories remain strong, replay often and put the sufferer back into the crisis."*

While flashbacks are temporary, a more general background rumination is also familiar to those who have experienced PTS(D). Richard's mind was stuck in a four-hour loop, starting with engine explosions, through two hours in the air, then two hours on the ground. The loops were incessant and exhausting, while awake and in his dreams. A related problem is counterfactual thinking – mental simulation of 'what ifs'. *"During the day when I was suffering PTS, my conscious mind was full and distracted. I had no free mental space. I couldn't stop thinking about the event. I was thinking about 'what-ifs'. There was no room for anything else."* This can bring feelings of 'survivor guilt' and shame, even if others would see no justification for these feelings. Such rumination is common among people with PTS(D). While it seems counter-intuitive, it is actually a form of 'avoidance' since it avoids actively processing the traumatic event itself.

Another symptom is hyperarousal or hypervigilance, where the mind and body are on red alert to perceived threats. Of all the symptoms of PTS(D), hypervigilance, heightened startle reactions and associated 'fight-flight-freeze' states can be the most physically and mentally exhausting and debilitating. Everyday things and situations can become potential threats, and reactions tend to be neither proportionate nor predictable. Because of this, focusing can be a problem. *"If I read a sentence, I'd immediately forget it. I was looking at the words, but I wasn't reading or absorbing them. My mind was totally preoccupied and distracted."*

Sleep was also a problem. Sleep is shorter, lighter and more disturbed with PTS(D), and disturbed sleep exacerbates the condition. Sleep disturbances such as insomnia, fragmented rapid eye movement sleep, and nightmares predict later development of PTSD symptoms, and go on to maintain and exacerbate PTSD. Research findings show that sleep affects emotional regulation and so-called memory extinction, a process of new learning that inhibits older memories. *"One side of my brain seemed to be awake. And even when I was dreaming, I would have lucid dreams about the event and all the 'what-ifs', so I would wake up even more stressed and exhausted. The bad dreams reinforced my bad memories. They didn't weaken with the processes of*

sleep." Memories of QF32 were persisting and being reinforced. Newer, more pleasant memories were not getting laid down. To many, nightmares can be one of the most acutely distressing symptoms of PTS(D). As they reoccur, and you come to expect them, sleep can become further affected, with severe consequences for mental and physical health – a vicious circle.

PTS(D) and the Brain

When talking to Richard, his enthusiasm for the inner workings of things is impossible to miss, whether referring to an A380 or the brain. *"Well, I'm fairly mechanical, so I always have to start at the core."* He is naturally analytical and understanding the brain and mind was, for him, an essential part of recovery. The first chapter in *FLY!* is about neuroscience. When talking to him, he often refers to the brain's core – the limbic system, which serves several functions necessary for preservation, as an individual, group, and species. *"The amygdala, the thalamus, and the hippocampus form the old subconscious lizard brain. It's fast and responds to threats. And we have the cortex, which is a slow but very powerful part of the sentient mind, providing thought, awareness, consciousness, reasoning, prediction, so on."*

Traumatic experiences are so common that you or someone close to you is likely to experience them at some point in your lives, and many of you will experience PTS, which for some will progress to PTSD.

Richard found it useful to understand why, with PTS, people think, feel and react the way they do. *"If you can just be aware that the amygdala – the emotional centre – is responding to threats very quickly. It's situated below the cortex but it's disconnected from the higher conscious functions of logical analysis, reasoning and language. This helps to explain our gut feelings and fears that we cannot explain in words. With the fear response of fight, flight or freeze, the amygdala causes levels of cortisol and adrenaline to spike. That increases our heart and breathing rates, tightens our muscles, and turns off part of our immune system."* For people with PTS(D), it means that they may be angry, touchy, emotional, nervous or even unresponsive.

For Richard, understanding brain function helped him explain his experience, normalise his feelings and remove shame.

He also noted that with PTS(D), the amygdala and cortex can become cross-coupled in a situation of positive feedback that leads to overload and panic, from which recovery is difficult. Passengers with a chronic fear of flying know this state well. This is the feeling that causes some to stand up and try to open the aircraft door. This also helps to explain people's fights for toilet paper during the coronavirus crisis.

Symptoms of PTS(D) will depend on the person, but it is not just a mental condition. It is profoundly physical. Research indicates a variety of biological changes. The amygdala helps control emotion, memories, and behaviour, and the right hemisphere, which controls fear and aversion to unpleasant stimuli, can change in volume. The hippocampus, which helps to consolidate the transfer of information from short-term memory to long-term memory, can become significantly smaller.

Brain signals are affected, as are hormone levels. Noradrenaline (or norepinephrine) helps to mobilise the brain and body for action, and levels tend to be raised with PTSD. Cortisol, meanwhile, helps the body to respond to stress, and baseline levels are often lower in people with PTSD compared to people without PTSD. Research shows that cortisol helps to reduce the levels of high adrenaline that are released during a 'fight or flight' response. Adrenaline (and noradrenaline, or norepinephrine) is also involved in memory formation. But the picture is complex, and there may be a greater cortisol response to trauma-related memories, especially in men. On a more relatable level of physical experience, PTS(D) feels like it is stored in the body – in the head, muscles, and skin.

Many with PTS(D) also experience physical illnesses, often associated with detrimental changes to the immune system. In Richard's case, he was sick for two months after QF32 with pneumonia. *"The sickest I've ever been"*, he said. Some research evidence indicates that PTSD is associated with several conditions, including viral infections, cancer, Alzheimer's and obesity.

Opening Up: Acknowledging PTS(D)

Traumatic experiences are so common that you or someone close to you is likely to experience them at some point in your lives, and many of you will experience PTS, which for some will progress to PTSD. It is so ubiquitous that we rarely acknowledge it or talk about it. PTS(D) symptoms can remain hidden for months or years after a triggering event. Many will never come to understand or accept their experiences. This can create severe complications. Richard said, *"PTS is a normal reaction to stress. But if we don't manage the PTS then it can become a more physiological condition, which is PTSD. And that's when you can suffer greatly."*

Richard noticed something interesting after giving presentations about PTS. Sometimes, women would ask him to sign a book for their husband. He was curious about why this was. *"I'd say, 'Sure, why doesn't he come and talk to me?' And they'd say, 'Well, he can't. He's outside crying!' That happens regularly."* Many who have experienced PTS(D) will recognise this. For some, discussing or accessing memories of the original traumatic events is too much to bear, while others can but struggle to discuss the symptoms of PTS(D) without crying. Richard noted that, *"Women tend to express what they're feeling and that's part of the grieving process. Men tend to hide their emotions, particularly military veterans."* There is a large body of research on this. But one finding is consistent: women cry significantly more than men. And research also suggests that crying has several benefits for wellbeing.

On writing and talking about PTS(D), Richard found that many of those he had written about were suffering in silence. *"About half the people I wrote about in QF32 contacted me afterwards and said, 'Thank you for writing about the PTS that you had, because I had a traumatic experience, and have suffered PTS and nightmares ever since. And that's the first I've ever heard of it."*

This may explain the interest in PTS and QF32. It will surprise many to learn that the second most-asked question Richard is asked about QF32, is about PTS. (The first was about why he didn't pass the route check on the day.)

It seems that many of us, and especially men, deny or hide our experiences or else try to fight them alone. For traumatic experiences, this denial prolongs a struggle that is already too much for any of us individually.

Richard wrote in *FLY!* that he thinks every one of the 26 QF32 crew members, and many passengers, suffered PTS to some degree.

PTS(D) and Just Culture

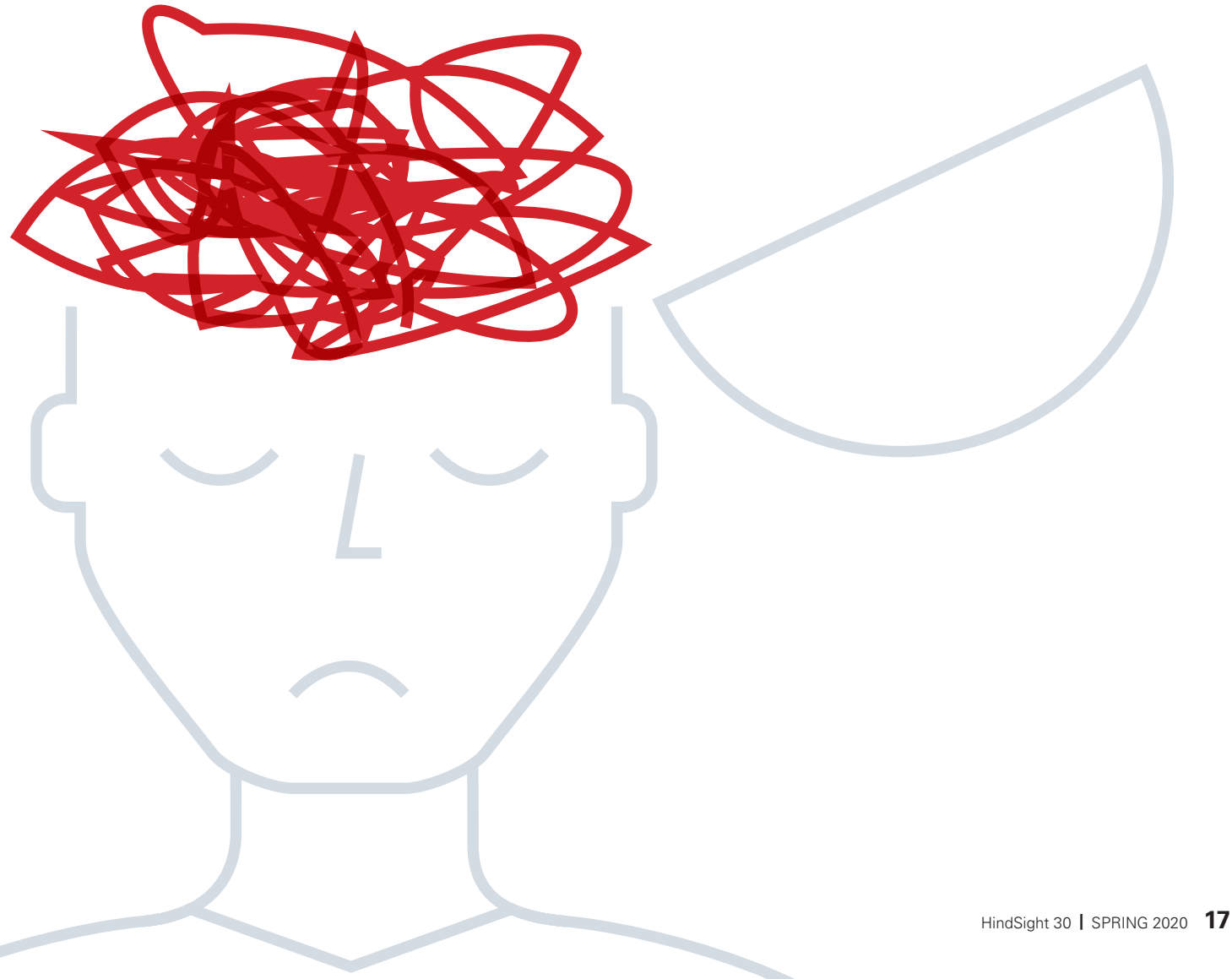
Our conversation moved on to another dimension: just culture as a critical part of PTS recovery. *"QF32 turned out well. It had a happy ending. But what if I'd made a mistake and it didn't turn out well? What if someone had died? Then I'd have intense guilt and shame. And if you don't have a just culture, and in an environment where people might be criminalised for their honest mistakes, the PTS gets a lot worse."* Accidents happen sometimes, he noted, particularly where decisions must be made quickly under uncertainty. *"We need to really be on the lookout for people who have, through an honest mistake, had an incident, because they will most likely be suffering severe post-traumatic stress."*

He emphasised how this attitude is necessary not only for senior management, but everyone, including colleagues. *"Everyone has strengths and limitations, but failure is part of the human condition. I embrace failures as opportunities to learn and adjust. And I don't mind that errors happen in the cockpit. What's important is that we detect and fix them so they don't escalate."*

Time Out

Once Richard realised that he was experiencing PTS, he knew that he had to recover before returning to work.

He recalled the actions of Major General John Cantwell, now a retired senior Australian Army officer. Cantwell opened up about suffering from PTS as a result of military service that included leadership roles in the Gulf War (1990-1991), in Bagdad (2006), and as the Commander of the Australian Forces, Middle East & Afghanistan in 2010. John wrote about his PTS(D) in his book *Exit Wounds*, published in 2012. *"You must*



get yourself out of leadership positions if you are suffering PTSD," said Richard. *"You must take yourself off-line. You're not in a fit state to make good decisions and lead others. It is critical that you take yourself out of positions of responsibility, especially concerning safety."*

Specifically, air traffic controllers, pilots and others in positions of leadership and responsibility should not go to work if they are suffering PTS(D), until it is treated. In Richard's case, it took four months. *"After QF32, one of the managers said, 'Richard, you've had a bad week. I want you take a week off.' And I said, 'You know what? I think I need a couple of months.'"*

Soon after returning to Sydney, Richard was meant to take delivery of a new A380 from Toulouse and fly it to Australia. This was a great privilege, and a reward for handling a 24-hour delay on an earlier flight. But he knew he wasn't ready. *"I rang the A380 fleet manager, and I said, 'Look, I'm not sure I'm able to evaluate my fitness to fly, so to be safe, you should take me off that delivery flight. You need to allocate it to someone else.' And he said, 'Thank you, Richard. Thank you for saying that.'"* Following this, Richard sought psychological counselling.

It seems that many of us, and especially men, deny or hide our experiences or else try to fight them alone. For traumatic experiences, this denial prolongs a struggle that is already too much for any of us individually. This is understood among those who work professionally with trauma. Dr Peter A. Levine, author of the book *Waking the Tiger: Healing Trauma*, wrote, *"Because the symptoms and emotions associated with trauma can be extreme, most of us (and those close to us) will recoil and attempt to repress these intense reactions. Unfortunately, this mutual denial can prevent us from healing. In our culture there is a lack of tolerance for the emotional vulnerability that traumatized people experience. Little time is allotted for the working through of emotional events. We are routinely pressured into adjusting too quickly in the aftermath of an overwhelming situation."*

Richard recalled a pilot colleague who turned up to a briefing one morning before a seven-day trip. Richard noticed that the man looked tense, his fists closed tight. Richard asked the pilot *"What's the matter?"* The pilot replied, *"Nothing"*. Richard persisted until the pilot revealed that his mother had a heart attack the night before, and was in hospital. *"I said, 'Why are you here?' He said, 'I've got to do the trip.' I said, 'No, you don't.' I rang up the chief pilot and we got him a taxi to see his mother in hospital. If you look for the signs, you can detect stress in other people. As a leader, you have a duty of care."*

Referring to pilots, air traffic controllers, and others in positions of responsibility, Richard talked about the need to be humble and vulnerable about one's mental state. *"In the same way that we feel no shame to tell others about broken bones and other physical injuries, we should not feel reticent to admit fractures in our mental health. We need to say, look, 'I'm not well and I need to seek help.' Faced with the stresses that we have today, the people that will cope are the people who will detect that something is wrong, tell others and seek help."*

As noted by Amy Edmondson in her book, *The Fearless Organization*, this is helped by an environment where it is psychologically safe to be vulnerable. *"And that that is the critical thing we need,"* said Richard. *"If we want to care for and bring the most out of the people, then we need a culture of psychological safety where people feel safe to step up, voice their problems and ask for help."*

But many with PTS(D) do not understand or communicate their experience. Richard said, *"You never know the state of people when they turn up to work. You never know what's happening in the background. So you can only look for the signs."* In some cases, people may mention that they're suffering PTS. In these cases, *"We should be empathetic and compassionate and believe them because it takes courage to talk about this. We should help them to seek professional help."*

Recovery and Growth

In *FLY!*, Richard wrote that *"PTSD wears you down physically, mentally and emotionally, damaging health, happiness and relationships."* No one who has experienced it would disagree. But the truth is that there can be recovery and even growth from trauma. People recover from PTS(D) in different ways. Efforts to recover may need to address the physical, mental, interpersonal and spiritual dimensions. People find benefits in exercise, psychotherapy, walking in nature, meditation, writing, poetry, and – crucially – sufficient, good quality sleep. For Richard, it initially involved a few sessions with a psychologist. *"You need trained professionals to build trust with the person and work out a way to recovery."* For Richard, this involved replacing unwanted memories with good memories, an approach known in the literature as 'memory reconsolidation'. However, there are various ways to work clinically with PTS(D), with psychologists, psychotherapists and psychiatrists. An early sign of Richard's recovery was when he became interested in aviation again. Three months after QF32, he started looking up again at aircraft in the sky.

But even after initial recovery, people's PTS(D) can still be triggered many years or even decades later by reminders of the events or the symptoms, or both.

Research on 'post-traumatic growth' shows that there can be growth from trauma, and people can come out of post-traumatic stress stronger, albeit different.

Richard overcame this by reading and writing to understand PTS(D) as thoroughly as possible. *"I'm a logical person. I didn't quite understand. I just wrote two pages about post-traumatic stress in QF32, but then I studied a lot more about PTS and PTSD for FLY! I found it cathartic to write and talk about it."* Since then, he has spoken about QF32 so many times that it does not trigger an emotional reaction. *"There is nothing in the QF32 story that drags me to tears."*

In *FLY!*, Richard talks about the analogy of PTS(D) and a broken vase. Once it's broken, it may not be possible to remake a vase, but you can make something new – a mosaic. *"Well, when you come out of PTS(D), when you start to heal and grow, you're not going to be the same person any more."* Research on 'post-traumatic growth' shows that there can be growth from trauma, and people can come out of post-traumatic stress stronger, albeit different.

Richard still flies the A380 (currently grounded by the coronavirus crisis), has written two books and delivers presentations to many governments and industries worldwide. He is involved in clinical safety with many organisations and is the Ambassador for Health, Safety and Quality at St Vincent's Hospital in Australia. *"There were many opportunities that presented after the QF32 crisis. I accepted the challenge to take up some of these opportunities. After a crisis, some of us are given a platform to take what they've learned and put it to great use to help others."*

Often forgotten in literature about PTS(D) are the partners and other loved ones who experience the person's symptoms or may be traumatised by the event itself, who may suffer from secondary trauma. Partners and families of people with PTS(D) also find the symptoms difficult to live with. These may include anger, irritability, moodiness, emotional and physical distance, and unpredictable crying. Richard said, *"It was at a party three months after the QF32 event when the first person approached Coral and said, 'You know, Richard's had a bad time after this flight. How do you feel?' Coral burst into tears. No one had ever asked her that question."* More recently, Richard was surprised to learn that, even after several years, certain memories of QF32 still upset his wife.

During the process of recovery, Richard kept his pilot's licence current in the simulator and went back flying once he was well enough. After four months off, fully recovered, he got back into a plane. *"I was fine because I'd taken all that time off to satisfy the investigators, company, media and to get my emotional health back. And I've never looked back because I resolved my PTS. I've flown out of Singapore in Nancy-Bird Walton [the A380] many times and while those southerly departures sometimes trigger memories of QF32, these memories are calm and factual, not fearful emotional memories, so I don't suffer a fear response."*

QF32 and You

You are highly unlikely to experience an event that is even remotely similar to QF32. But during your life, you or someone close to you will probably experience PTS. Your understanding and response to them will determine whether your recovery is swift or long. Understanding the symptoms and underlying causes, and finding or offering support – from friends, family, colleagues, and professionals – may be the crucial difference. And by taking positive steps, you are more likely to grow from the experience.

FLY! - Life Lessons from the Cockpit of QF32 was published by Penguin Random House in 2018 (Fly-TheBook.com).

QF32 was published by Pan Macmillan in 2012 (QF32.com).

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Richard Champion de Crespigny is an Airbus A380 Captain with Qantas Airlines with over 20,000 flying hours. He was born and educated in Melbourne, Australia. He decided on a flying career at 14-years old when his father organised a tour of the Royal Australian Air Force (RAAF) Academy at Point Cook in Victoria. Three years later, he joined the RAAF Academy in 1975 and began flying a year later. By 1979, he had successfully completed a BSc in Physics and Maths, and a Graduate Diploma in Military Aviation. He continued in the RAAF until 1986, when he joined Qantas, where he converted to Boeing 747s. In 2004, he converted to Airbus A330 and in 2008 converted to Airbus A380 as one of Qantas' most senior captains.

Following QF32, Captain Richard Champion de Crespigny was appointed as 'Member in the General Division of the Order of Australia' (AM) "for significant service to the aviation industry both nationally and internationally, particularly for flight safety, and to the community". He has won a number of awards including Flight Safety Foundation Professionalism Award in Flight Safety and the Guild of Air Pilots and Air Navigators Hugh Gordon–Burge Memorial Award for Outstanding Contribution to Air Safety (both in 2011). In 2014, he was awarded Doctor of the University (honoris causa) at Charles Sturt University. He has written two best-selling books: *QF32* and recently-published *FLY!* Life Lessons from the Cockpit of QF32.