On 4 November 2010, an A380 Airbus departed Singapore for Sydney. As the aircraft climbed over Indonesia there were two loud “booms”. The Number 2 engine had suffered a rare explosion; the first of its kind in over 40 years and 200 million hours of operating Rolls Royce jet engines.

Shrapnel from the disintegrating engine cut more than 600 wires and left more than 100 impacts in the wing, about 200 impacts on the fuselage and 14 holes in the fuel tanks. Electrical and control systems were severely damaged. Two other engines, in addition to the destroyed one, were operating below capacity. Fuel was streaming from the wing.

De Crespigny and his crew faced an aircraft that was barely controllable. The computerised flight system continually bombarded them with checklists and alarms. They managed to stabilise and then land the severely damaged aircraft with no injury or loss of life. While de Crespigny says any Qantas crew would have been just as successful, no one has since been able to duplicate their landing on a simulator. Captain de Crespigny in his book and various interviews highlights a number of lessons for leaders under pressure.

**Lesson 1. The nuances of Crew Resource Management (CRM)**

Crew resource management is an air force concept. De Crespigny has extensive military experience piloting large aircraft. As result, he always makes a point of very clear lines of authority and delegation among the flight crew. De Crespigny was undergoing an annual assessment of his skills so there were two additional pilots on QF32: a check captain, Harry Wubben, and a senior check captain, David Evans, supervising Wubben. With first officer, Matt Hicks, and second officer, Mark Johnson, there were five pilots in total.

De Crespigny pays tribute to his colleagues and says the successful landing was a team effort. But he makes the point that a team needs a leader. ‘The flight deck is not a committee’, he says.

*The pilot in command has ultimate responsibility for the aircraft. Their seat is where the proverbial buck stops. But at the same time control is often best exercised through delegation.*
In the book *QF32* de Crespigny writes of his standing order to the pilots in the second-row seats, ‘If we are all up front looking down, you look up. If we are all looking up, you look down.’

The ever-shifting balance between authority, delegation and consultation meant de Crespigny made many decisions himself, and consulted the entire crew when there was time.

**Lesson 2. The cliché is true: aviate, navigate, communicate.**

The crew of QF32 was faced with an unprecedented number of checklists from the A380’s electronic centralised aircraft monitor (ECAM). De Crespigny estimates there were more than a hundred and twenty.

‘We were getting checklist after checklist telling us what was wrong. It took us an hour to know what all the threats were—then we had to mitigate them.’

Despite this, the crew adhered to one of aviation’s most hallowed (and wise) clichés: ‘aviate, navigate, communicate’. It means the first priority is to keep control of the plane (Aviate), then know where you are (Navigate), then you can make radio calls and cabin announcements (Communicate).

‘Every 10 minutes we reassessed the fuel and whether we should continue doing checklists, or ignore the checklists and just (somehow) get the aircraft down on the ground. We all discussed it’, says de Crespigny.

‘With threat and error management you have to fix the problem—or mitigate for its loss. It’s a see-saw: if the aircraft wing had been on fire I would have put it straight on the ground or into the water. But we didn’t have a wing fire so we had more time – but how much more time? There’s also a threat of landing an aircraft in an unknown state … I think if we had thrown the aircraft down straight away people might have died.’

‘No checklist was actioned immediately,’ de Crespigny says. ‘We discussed everything. We were trying to assess the threat and either fix it, or work out how we would mitigate it.’

De Crespigny admits to reaching task saturation in the midst of this chaos until (as he puts it), "..I had my epiphany. My mind switched. I inverted the logic. I remembered what Gene Kranz, NASA’s Flight Director, said during the Apollo 13 mission: ‘Hold it! I don’t care about what went wrong. I need to know what is still working…’ We went back to basics and it became easy..." The crew began ignoring checklists in favour of confirming what was still working.
A habit from de Crespigny’s military career asserted itself as they prepared to land. He insisted on a control check. ‘It’s bred into the air force psyche. We did a dress rehearsal of the landing at 4000 feet. If we had been losing control we would have sped up and brought the flaps up one step. As we landed we got speed and stall warnings, they were certainly unexpected—but deep down I knew the aircraft would fly because we’d practiced the landing.’

A control check is not usual in civilian flying. The military do it to check that a combat damaged plane will fly as expected. The checks assured the crew that the plane would be stable down to the runway.

Runway 20C at Singapore is 4,000 meters long. The crew had calculated that in its damaged condition the A380 would need 3,900 meters to stop if the Pilot executed a perfect touchdown. Capt. de Crespigny did just that and got the aircraft stopped just 150 meters short of the runway’s end.

De Crespigny is an enthusiast for all Airbus aircraft, but he says automation can make it more difficult for pilots to honour the command to always aviate.

‘Flying is getting much harder because there is so much more automation and many more systems. There are four million parts in an A380. Manufacturers may say automation makes flying easy, but I maintain that if pilots are to recover an aircraft from an unimaginable position they still need to have detailed knowledge of that aeroplane.’

**Lesson 3. It’s not over after you touch down**

Weeks after the event de Crespigny found himself weeping, for the first time since his mother died decades earlier. He wept while recounting the event to ATSB investigators. There was another bout of tears and a six-hour car trip where he hardly spoke to his wife, Coral. Instead he went over and over the flight in his mind. De Crespigny was confronting post-traumatic stress.

‘Pilots who have these incidents ... we’ve never been told what to expect, nobody around us knows how to handle us and we’re totally blind as to how our emotions are affecting our lives and our work,’ he says.

‘Even for pilots who think they’re OK, the stress they thought they were handling can re-emerge.’

‘I insisted that it go in the book. I, and all male pilots are alpha males; we think we’re indestructible. When something happens we think “let’s toughen up and get through it”.’

De Crespigny instinctively knew it was more than a question of toughening up.
I was scheduled to take delivery of a brand new A380 three weeks after QF32. I called up my manager and said, “I am not in a condition to assess whether I am safe to fly. You have to take me off this trip.” It turns out I wasn’t in a fit state at all. I was so preoccupied with the aftermath of QF32.’

He visited aviation psychologist Ron Zuessman who, with a bluntness appropriate to his speciality, said: ‘I know pilots: what’s your problem?’

Zuessman explained how de Crespigny’s tears were a delayed expression of the stress he felt during the emergency. ‘He said, “revisit it, keep doing it – it will go away – if you don’t revisit it then it will stay there in your mind for ever, and every time it re-emerges, it will be just as painful as it was the first time.” ‘I went away, thought about it and realised the crying was just natural’.

Zuessman then started working on what de Crespigny calls ‘the loop’—his endless mental replaying of the flight.

‘Do a deal with Coral that you’ll stay in the loop for enough to write down all the details of the flight for the investigators. After three weeks I’ll teach you a process to get out of the loop and start forgetting.’

The method was simple, but took advantage of recent research on brain function: ‘Just as I’m about to serve in a game of tennis I think QF32’, or when I’m mowing the grass I suddenly think QF32, de Crespigny says. ‘Anything that needs intense concentration, I think of QF32. It’s a way of making new synapse connections and breaking the older, post-traumatic stress synapse connections in my brain.’

‘In the weeks before I returned to flying I was looking up whenever an aircraft went over: I was ready for normal flying duties. I’m back flying now. I’m sane, content and not afraid of anything because I took time to handle the PTS. Most importantly I’m not afraid of the aircraft. My message in putting this long description of post-traumatic stress in the book was to let others know that these issues are real and that they can be fixed.’