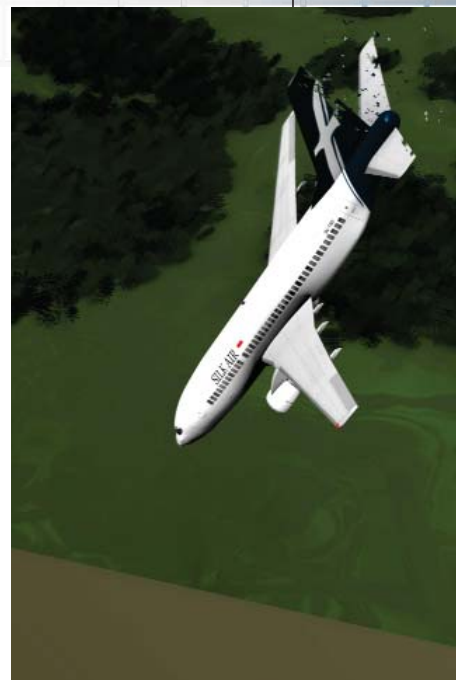


# IT TAKES A VILLAGE TO RAISE A CHILD

There have been at least five incidents of plane crashes related to pilot suicide in the past few decades.

Michael R. Grüninger and Capt. Carl C. Norgren review homicide-suicide events involving aircraft and the risk factors associated with these events



**104** fatalities, 19 December 1977: The crew disabled both flight recorders and set the control inputs in a manual nose-down flight path. Near Palembang (Indonesia), the SilkAir Boeing 737 began a rapid descent, broke up and crashed into the Musi River delta.

1 fatality, 11 October 1999: An Air Botswana captain who was grounded for medical reasons took off in one of the airline's ATR42s. He demanded to talk to airline officials and the president of Botswana. He told the air traffic control that he was planning to crash the airplane. Later he struck two ATR-42s parked on the apron.

217 fatalities, 31 October 1999: Over the Atlantic Ocean the relief first officer of an Egypt Air Boeing 767 apparently shut off the autopilot and the engines and pushed the flight controls forward. The captain returned to the cockpit, but was unable to recover the airplane.

33 fatalities, 29 November 2013: Over Namibia's Bwabwata National Park, the captain, while alone in the cockpit, re-programmed the altitude preselector to a lower altitude and manually reselected the airspeed in LAM's Embraer 190. The flight crashed near maximum operating speed. Sounds of pounding on the cockpit door were heard on the cockpit voice recorder.

150 fatalities, 24 May 2015: Germanwing's Airbus 320 crashed in the French Alps. The first officer had locked the captain out of the cockpit and used the autopilot to put the airplane into a descent towards an altitude of 100ft. Then, he modified the autopilot setting to increase the speed.

These accidents open a view into the abyss of pilot despair and tragedy and its disastrous consequences in aviation.

## Good Reasons for Going Mad?

The topic of suicide by pilots is difficult for the industry to discuss. For many technical, operational and general health topics, we are familiar with the correct words and their meanings. Mental illness and human despair are not topics, we are used to discussing. Our industry culture, including our safety culture, has not yet developed a mainstream vocabulary to discuss this issue. Maybe the subtitle "Good Reasons for Going Mad" is politically incorrect and offensive. But is deciding to commit suicide really madness? Or is it rather a decision taken by a rational person after thoughtful consideration of all factors of their personal and professional life?

In aviation, the real threat is the combination of suicide with homicide. Killing other people while committing suicide is murder and, thus, a criminal act.

## ABYSS

*These accidents open a view into pilot despair, tragedy and its disastrous consequences in aviation.*

# SAFETY SENSE



Despite all efforts over the past years, the 'L' is still not discussed for including suicide. And yet it is a vital element of flight safety.

Immediately after the Germanwings crash, the dual occupancy cockpit policy was introduced in the EU. Pilots were no longer allowed to remain alone on the flight deck as an immediate mitigating measure against suicide attempts by individual pilots. Reinforced flight deck doors mandated globally after the '9/11' terror attacks in the US allowed a suicidal pilot to easily deny persons access to the flight deck from the aircraft cabin.

The aviation industry started discussing ways to prevent pilots with suicidal tendencies to go unnoticed.

### The S and H in the SHELL Model

Although suicide-homicides by pilots are an extremely rare event, they do occur. Intervening on the liveware is not a guaranteed solution, since humans evolve over time and change mood and mind.

Consideration may, thus, be given to the 'S' and the 'H' of the SHELL model. The 'S' stands for software and the 'H' for hardware.

To completely eliminate the possibility for pilots to commit suicide-homicide while in the cockpit, several ideas have been brought forward.

Aircraft manufacturers could program the flight control computer in such a way as to make it impossible for fly-by-wire aircraft to enter into a Controlled Flight into Terrain (CFIT) event.

Or the aircraft flight control logic could be changed to require both of the pilots to execute inputs when near the ground, thus making it impossible for one pilot to single-handedly con-

Psychologists believe that some individuals consider the death of others to be necessary to facilitate their own suicide. But what leads an individual to such a desperate act?

The decision to commit suicide-homicide might be triggered by numerous external factors. The feeling that there is no other way out of an unbearable situation might depend on pressure caused by job-related factors such as poor management decisions, a lack of professional development opportunities, rigid career models based on seniority, disappointment caused by negative career events (e.g. failed promotions, undesirable base and fleet allocations). Latent conditions may lead to such desperate acts.

Alternatively, pressure can be caused by situations in the private life of the individual. Failed relationships, personal failures and disappointments, economic hardship and mental problems may trigger a sequence which leads to suicide.

Tragically, some people want to die even if their own death implies the death of many others.

Maybe a mature safety culture, so often invoked as the basis of safe operations, should include considerations and active measures to promote those factors in a company and working environment which reduce the occasions for pilots, or any other aviation personnel, to feel trapped in a situation only suicide promises to bring relief from.

### The SHELL Model

Aviation personnel come across the SHELL model during human factors training.

The SHELL model is a conceptual framework presented in ICAO Circular 216-AN31. The SHELL model was first developed in 1972. The first L stands for liveware. Liveware represents the human being. Liveware is at the center of the SHELL model. The fact that the SHELL model contains two 'L's shows how important the human aspect is in aviation safety. The two 'L's stand for the relationship between humans. Personal fitness and relational co-operation among professionals are key to flight safety too.

**150**  
The number of fatalities from the May 2015 Germanwings pilot suicide crash.



control the flight phase while approaching the ground.

The introduction of real-time flight monitoring from the ground with the technical possibility to override the pilots on the flight deck could also be considered.

It might well be that these ideas might not pass a thorough safety assessment. For now, the industry has focused its mitigating strategies on the 'L' factors: peer-to-peer programmes and the psychological screening of new pilots entering the industry. Both these measures are not without limitations.

#### Peer-to-Peer Observation and Reporting

Since the two 'L's, human to human, work together professionally on the flight deck, and often share social time during lay-overs and other professional get-togethers, it was suggested that industry should try to educate pilots on how to identify and report signs of mental illness. Also the families of pilots should be educated to identify and report signs of mental illness. But the challenge is tricky. Mental illness is hard to recognize by an untrained eye and still a taboo area.

As a third element in preventing mentally unfit pilots to cause disaster, the industry should create 'safe zones' for pilots to voluntarily report any issues. These safe zones should protect pilots from retribution by the employer and from the social stigma attached to mental health issues. Independent organizations providing such 'safe zones' exist in various countries. They guarantee anonymity, provide peer group support and various forms of professional advice.

#### Screening

In 2013 the WHO acknowledged the damage to society caused by suicides and launched a global initiative to reduce the number of suicides in the general population. The WHO estimates that 800,000 people annually commit suicide. If recent studies are correct in claiming that 10 to 15 percent of the general population experience depression sometime in their lives and that the risk of suicide among depressed patients is about 20 times greater than in the general population, then the aviation industry as well is facing a serious challenge.

Most professional pilots are screened for mental health problems during the initial hiring process. The recurrent aeromedical examination thereafter does normally not focus on mental health.

In parallel with the high growth rates in aviation, the pilot population has also grown rapidly. Often screening of new pilots might not be sufficiently thorough. The urgency to fill flight deck positions is too pressing.

If screening of new pilots is not performed in sufficient detail and depth, once a pilot has been hired and trained to proficiency, the incentive to retain pilots is huge in order to prevent the loss of the investment in that pilot by the company.

#### Mentally Unfit Is Not Crazy

Are you crazy? When we ask fellow humans this question, we often do not mean to imply the person is crazy in the clinical sense. It's an expletive, criticizing the wrong-doing we observed without implying that the person who made the mistake might actually be crazy.

But in aviation the awareness has grown that sometimes pilots are indeed crazy, or, to put it in less provocative words, mentally unfit for the job as a pilot.

Not only pilots are at risk, though. Also other aviation personnel may be mentally unfit. While pilots act at the controls of aircraft, an accident chain can be started also on the ground without direct access to flight controls.

#### Working Together – Solving Problems Together

In Africa there is a well-known saying: It takes a village to raise a child. The underlying concept acknowledges the importance of social interaction for the healthy growth of a human being. Maybe this concept should be transferred to aviation: It takes the aviation industry to preserve the well-being of aviation personnel and, thus, of their passengers. Personal problems are not for the individual to solve alone.



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#### Village

*It takes a village to preserve the well-being of aviation personnel – and their passengers.*