

InterPilot



The Journal of the International Federation of Air Line Pilots' Associations

Losing it...and finding it

Critical Incident Stress

January - February 2010

Losing it.....



By Capt. Gavin McKellar

My guess is that we have all “lost it” to some extent at some point in our lives. You may have felt you have lost it after being hijacked by your emotions. Suddenly you find yourself in a place you never intended to be. Understanding the potential and process could raise awareness and aid prevention? Acknowledging that this is a possibility for any of us presents the opportunity to assign it a probability and define how grave a risk “losing it” will be. In most of the world’s developed countries road accidents are a major cause of death, certainly this is the case in my country. I would argue that most of these accidents are the result of somebody “losing it”. Whether it’s driving into something (a bit like controlled flight into terrain – CFIT), rolling your car (let’s call this a loss of control – LOC) or skidding off the road (excursion) in some way somebody has lost it – of course it might be the person who lost it could have been the designer of the cars throttle or braking system. The point is whatever the reason for losing it, taking back control must remain at the top of our risk management agenda.

Losing it CFIT style

In aviation for many years the top threat was from CFIT. By and large CFIT accidents came as a result of the crews involved collectively losing it in the form of degraded situational awareness and continuing on a course of action despite a number of cues that something was not right until it was too late to do anything about it. In the majority of CFIT accidents the point of first impact is within 100ft of the summit of the terrain. Perhaps you can recall the loss of a Flying Tigers aircraft in Malaysia which continued on its fatal path despite the numerous “pull up” warnings? I’m sure that you will remember the Korean Air 747 that crashed on approach to Guam, the image of that aircraft’s wreckage scatted on the hill side five nautical miles from centreline is still imprinted on my mind. In South Africa we also had the 2002 loss of an HS748 due to CFIT which killed the dis-

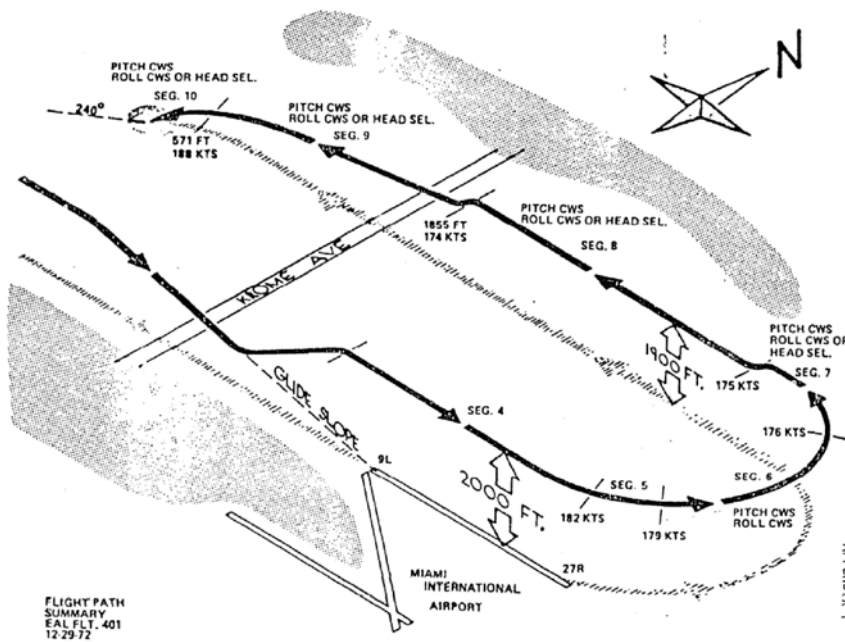
graced former captain of the national cricket team, Hansie Cronje.

Since the development of Enhanced Ground Proximity Warning System (EGPWS) and the advances in terrain mapping things have dramatically improved, since the installation of this fancy kit not one aircraft fitted with it has been involved in a CFIT accident.

Of course, there are still CFIT accidents they happen every year, it’s just now they happen to the 5% of the world’s airliner fleet not fitted with EGPWS. To me the implication is obvious without EGPWS the CFIT risk is just as bad as it ever was. This in turn raises a question, have those with regulatory oversight “lost it”? What about the CEOs of airlines, who have not fitted EGPWS, have they not “lost it” too? I think it is clear that they have lost sight of the risk presented by CFIT and, as a result, not taken the appropriate steps to reduce the risk. It is an obvious imperative that EGPWS is fitted in all air transport aircraft. Additionally, we can further reduce the risk by adopt-



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The loss of Eastern 401 came about when an inadvertent autopilot mode change caused the aircraft to descend unnoticed by the crew focussed on the accuracy of a nose wheel indicator light - Source NTSB

ing the minute to impact philosophy. This idea says that you should never have a rate of descent (ROD) greater than that which would have you in contact with terrain in less than a minute. In other words, at 3,000ft AGL the ROD should be less than 3,000 ft/min, at 2,000ft AGL ROD is back to 2,000ft/min and so on. Of course by 1,000 ft AGL we should be in a stable approach.

Losing it LOC style

Since the introduction of EGPWS and the dramatic fall in CFIT accident rates Loss of Control (LOC) has taken over as the number one category of accident – notice I said accident category rather than accident cause? An accident can have a variety of causes or more accurately factors and it is never wise to focus on just one element. The factors leading to a LOC accident can be weather related as in the case of the ATR72 crash at Roselawn. In its first report into the loss of United 585 while reaching no firm conclusion the NTSB thought that “an encounter with an unusually severe atmospheric disturbance” would be a likely cause. Later, following another fatal loss and further incidents, a flaw in the design of the rudder actuator was revealed as the actual problem. The same phenomenon was flagged up by the investigation into the loss of an Adam Air 737-400 in Indonesia. However unlike other events this departure from controlled flight happened during the cruise phase rather than on approach or immediately after an air-flow disturbance. Further investigations revealed crew disorientation leading to the design limits being exceeded the most likely cause. It seems that in this case the crew focussed on a failure in the aircraft’s

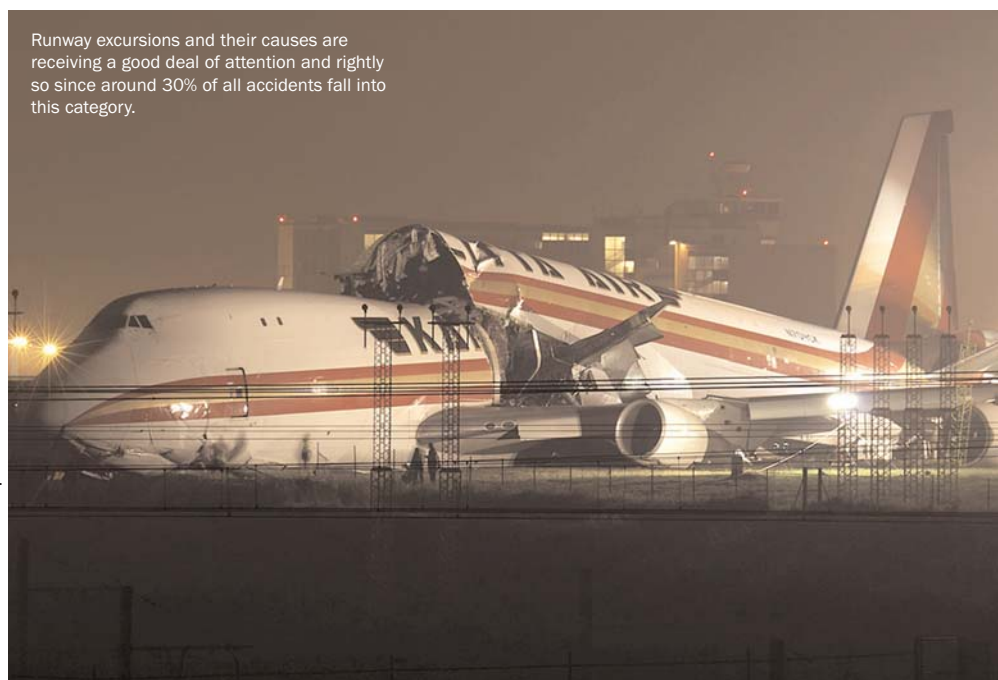
Inertial Reference System (IRS) and did not notice the departure from controlled flight until it was too late to recover the aircraft. This has echoes of other accidents one involving an L-1011 and another a DC-8. In both accidents the crews became fixated on diagnosing a fault to the extent that far more serious problems developed. In the first case a change in autopilot mode which allowed the aircraft to begin a gentle descent went undetected. A descent which continued until impact with the swamps of the Florida Everglades. While, in the latter, the aircraft ran out of fuel while the crew attempted to troubleshoot the fault in the right main landing gear.

There have been more recent, and as yet unexplained, control loss events. Why did a nearly new Kenya Airways 737 end up destroyed in a mangrove swamp shortly after takeoff? More recently, the LOC events in the Middle East and Central Asia and the United States are causes for concern. Not to mention the pending investigations into the

losses suffered by Air France, Ethiopian and Turkish in the last year.

Losing it runway excursion style

Runway excursions and their causes are receiving a good deal of attention and rightly so since around 30% of all accidents fall into this category and although happily they do not have the injury or body count of CFIT or LOC accidents they do occur with unacceptable frequency. In recent years there have been a number of high profile excursions at Little Rock, Toronto and Chicago to name but three examples. In each of these cases adverse weather and fatigue played an important role in the way the sequence of events developed. Much can be done to mitigate the effect of an excursion and we have seen this very graphically illustrated in recent weeks. Where there was an adequate runway end safety area (RESA) or an arrester bed the outcome was far better with few, if any,



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injuries to passengers and crews and little damage to the aircraft. It's not just for fun that we at IFALPA support the fitment of EMAS systems and require a proper RESA at the end of runways we use. Who can forget the Airbus overrun at Warsaw in which the Captain lost his life due to the mound of sand in the overrun area?

It still happens.

We see how the risk can be mitigated but how can we reduce the risk? I argue that most excursions are the result of losing it in just the same way as a CFIT or LOC accident. If we land long and fast on a slippery runway and continue in the normal way hoping that we will stop on the available pavement doesn't that indicate that we are not really aware of the situation? But what do the lessons of completed investigations teach us? Reports by investigating authorities of LOC and CFIT accidents often have a loss of Cockpit Resource Management (CRM) or a loss of situational awareness in the list of accident causes, that's pretty obvious really – if they had known where they were they wouldn't have flown into the mountain -right? To me this is a baseline problem; I don't think that statements about loss of CRM or situational awareness belong in the causal summary.

I think they would be better placed in the findings, in the list of safety factors involved. After all, what we really want to know is why there was a loss of situational awareness or poor CRM. Since this is the only way we can formulate strategies to rectify the problem and reduce the risk.

We must take into our equation the effect of disorientation, stress and fatigue. Of course by their nature they are more difficult to address and harder to prevent so we must have robust systems that are error tolerant. Good monitoring can help trap errors, checklists can identify items missed and redundancy can help mitigate the effects of errors. The maintenance of a division of labour on the flight deck the so called "I'll fly, you run the diagnostics" separation and it is also clear that the pilot

"flying" must remain focused on that activity no matter how high the level of sophistication of the automatics employed. We must make sure that the aircraft is doing what we want it to. That what we expect it to be doing is what it is actually doing and this activity must take precedence over everything else. The pilot flying must "aviate" while the pilot not flying is tasked with the "navigate and communicate" as well as troubleshoot. Let's get back to basics and apply situational control to every landing. Let's get the aircraft stable by 1,000ft AGL and touchdown in the zone. Let's focus on using the correct techniques for the aircraft with prompt use of braking, spoilers and reversers and if the approach doesn't look good or you are floating in the flare – go around. We need to match policies with practice even though your Flight Operations Manual (FOM) says that if you are not going to touchdown in the zone you must go around we don't practice the manoeuvre in the simulator. Maybe we should.

Legally does it

In all the examples I have given, another valuable lesson to learn is to stay "legal", stay within the regulations, SOPs and training you have received. I've racked my brains and I cannot think of a single instance where being "legal" has been unsafe. Remember, the more we rationalize, the greater the potential to accept risk and by extension, the risk increases. Pilots tend to be mission oriented people and the temptation to press on an alluring one. We see what we want to see, hear what will confirm the decision and act as our own "sirens on the rocks of risk". Being compliant and legal means managing the risk and being safe.



Gavin McKellar is a Captain with South African Airways flying 737-800s. He is also the chairman of IFALPA's Accident Analysis & Prevention Committee. He has previously flown the Airbus A300 and Boeing 747 with SAA. He was Manager of the SAA Flight Data Analysis Programme and Domestic Fleet Safety Officer and is presently the Gatekeeper for the SAA FDA Programme.

The Critical Incident Response Programme (CIRP)

Scenarios where there was a real threat of death or injury but were resolved successfully or even the perception of such a threat can lead to critical incident stress developing.

By F/O Louise Cullinan

The first question that needs to be asked is “what is a critical incident?” In CIRP, we define a critical incident as a stressful event that may evoke stress reactions by those either directly or indirectly involved. It may be an incident or accident, an occurrence such as an unruly passenger on the flight deck, or investigating an aircraft accident. A critical incident may overwhelm the normal coping mechanism and leave the individual feeling out of control or helpless. Like any stressful event aviation accidents prompt strong reactions for those involved, that almost goes without saying. Again unsurprisingly, pilots, cabin crews, accident investigators and their families have an elevated risk of developing critical incident stress reactions and this is best described as a psychological or physiological reaction to a critical incident; it often appears as a characteristic set of symptoms (some typical reactions are detailed in figure 1). Sometimes these normal reactions to an event can develop into the more serious post traumatic stress disorder (PTSD).

While there are obvious examples of the kind of critical incident that may induce stress reactions like being involved in an accident where serious injuries or deaths have occurred or an incident where there has been significant aircraft damage, we must also consider the effect of less obvious “survivor syndrome” scenarios where, for example, there was a real threat of death or injury (for example a bomb threat or near mid air collision) or even the perception of such a threat. It might be an incident where, because of its nature, there is major coverage by the media. An obvious example of these two factors coming into play was the ditching of US1549 in New York’s Hudson River. Clearly, this high stress situation did not conclude with the successful evacuation of the aircraft. In the weeks and months following the event the crew (and their families) had to deal with their hero status and the glare of media attention as well as the more typical stress that such an incident would bring.

In addition to being directly involved with an incident or accident, taking part in an investigation into an accident brings its own risks. Naturally, pilot investigation representatives are placed in situations of elevated stress as they seek to discover the reasons behind an accident in often gruelling and distress-

ing circumstances, perhaps heightened by a greater empathy the situation that the crew involved found themselves in. Other factors that may elevate critical incident stress risk include an engine failure or fire, an unruly passenger, a windshear event on approach or an unexpected deviation into an unusual attitude.

The stealthy stressors

Besides these more obvious stress inducing scenarios, a number of less obvious events common to the lives of pilots have been demonstrated as factors that can elevate stress including a simulator check failure, a crew member injured on the way to, from or during a layover as well as less obvious factors like a disturbance such as a fire in the layover hotel. Sadly, we live in times where there are additional risks to crews, a prime and tragic example being when terrorists attacked the Oberoi Trident and the Taj Palace hotels in Mumbai in 2008. As you may know, these hotels are used by a number of airlines as



Accidents, incidents or even terrorist attacks while on layovers are all potential sources of stress related illness

| Physical | Thinking/Cognitive | Emotional | Behavioral |
|-------------------|----------------------------------|------------------|----------------------------|
| Chest tightness | Blaming | Abandoned | Alcohol consumption |
| Chills | Confusion | Agitation | Antisocial actions |
| Cold | Difficulty calculating | Anxiety | Changes in activity |
| Diarrhoea | Difficulty concentrating | Apprehension | Changes in sex life |
| Dizziness | Difficulty in problem solving | Denial | Emotional outbursts |
| Fast breathing | Difficulty making decisions | Depression | Erratic movements |
| Fatigue | Difficulty naming common objects | Fear | Harsh with family |
| Grinding teeth | Difficulty reading | Feeling isolated | Hyperalert to environment |
| Headaches | Disorientation (place/time) | Feeling lost | Inability to rest/relax |
| Hormone changes | Distressing dreams | Feeling numb | Increase/Loss of appetite |
| Nausea | Hypervigilance | Grief | Job changes |
| Profuse sweats | Increased/decreased alertness | Guilt | Nonspecific body pains |
| Rapid heartbeat | Intrusive memories | Intense anger | Pacing |
| Sleep problems | Memory problems (short or long) | Irritability | Paranoia |
| Thirst | Offensive/Defensive self reviews | Limited contact | Relationship problems |
| Tremors (hands) | Overwhelmed by normal routines | Sadness | Speech pattern changes |
| Twitching | Poor attention span (decreased) | Uncertainty | Startle reflex intensified |
| Upset stomach | Seeing event over and over again | Wanting to hide | Suspiciousness |
| Visual difficulty | Slower thought process | Worry | Withdrawal into oneself |

Figure 1: Typical reactions to critical incident stress

layover hotels. While this was a horrific event, it also revealed the capabilities of the global CIRP network with teams from KLM and Lufthansa's CIRP programmes working with those from the Mayday Foundation and ALPA-Int.

What is a stress reaction?

In the context of critical incident stress management, stress reactions are psychological and physiological changes that occur in a person who has been exposed to a stressful event. Often we may not recognise our stress reactions and may even believe that because of our training and experience we are immune to them. Almost all people exposed to a critical incident will suffer some form of critical incident stress. Each person's stress reactions will be different (see Fig 1). However, CIRP has found that crewmembers experiencing stress reactions from an accident or incident most often complain about sleep problems, anger at the company, or the loss of "flying as fun." The ALPA Aeromedical Office has also found that of the pilots with post-traumatic stress disorder or long-term severe stress, approximately 70 percent of those who received proper assistance continued their aviation careers. Of those pilots not receiving any critical incident stress support, 60 to 70 percent left their aviation careers within two years of the critical incident or accident. Stress reactions may appear within days or they may take months or years to surface. If stress reactions do not diminish in frequency and intensity within a few weeks of the event it may be a sign that PTSD is developing. PTSD is a psychiatric diagnosis described as the development of characteristic symptoms following a psychologically distressing event that exposes a person to an intensity and/or duration of emotions outside the range of usual human experience. Major characteristics may include:

1. The traumatic event is persistently re-experienced, often as flashbacks or intrusive memories,
2. There is persistent avoidance of things associated with the trauma and numbing of general responsiveness, such as the inability to enjoy aspects of life previously important, e.g.

sex, hobbies, children, etc., and

3. There are persistent symptoms of increased arousal such as hypervigilance (always being on the alert for something to happen), sleep problems, irritability and outbursts of anger, difficulty concentrating, and exaggerated startle response.

PTSD has long-term debilitating effects but it can be treated. The diagnosis is not made if the disturbance lasts less than one month. A less severe form of PTSD is Acute Stress Disorder. These stress disorders seriously threaten your health, career, and family. Early intervention has proven effective in preventing or mitigating the development of long-term stress disorders.

What is the Critical Incident Response Programme?

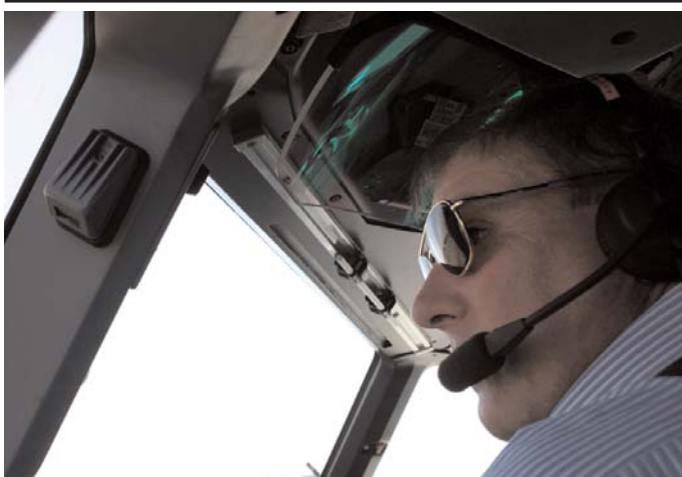
The Critical Incident Response Programme was implemented by ALPA-Int in 1994 as a flight safety initiative aimed at assisting crew members, accident investigators and their families following a serious incident or accident. The programme, which provides pre incident education and post incident/accident intervention services is aimed at aiding normal recovery before the effects of harmful stress reactions can begin to affect job performance, careers, families and health. It works through a system of peer support volunteers (PSV) who have been specifically trained and certificated under the International Critical Incident Stress Foundation, using peer support and CIRP protocols that assist crew members, accident investigators, or their families with a critical incident. This support consists of phone calls and person-to-person contact. The first step is referred to as a One on One and is designed to provide education on stress reactions. One on Ones usually take place as soon as possible after an event and may be done by telephone. The next step is a defusing and it is a three-step process that lasts about 20 minutes and may involve follow-up calls. In most cases the process will do much to relieve the symptoms however, this may not always be the case which is where a Critical Incident Stress Debriefing (CISD) process can

be instigated. The CISD is a seven-step managed venting of thoughts and reactions to a critical incident by those involved. This debriefing usually occurs within a week after an accident or incident; however, it can be done weeks, months, or even years later. The CISD is conducted by Peer Support Volunteers and always includes a mental health professional. Debriefings are confidential and do not involve management personnel. CISDs are not operational debriefings. They are conducted to provide support to the individuals involved and to mitigate the long-term effects of stress reactions. No records or notes are kept during debriefings. A typical CISD lasts from 1 ½ to 3 hours depending on the size of the group.

Remember, it's normal for individuals to suffer the effects of critical incident stress - it's a normal reaction to an abnormal situation. It is normal for individuals to be unable to recognise their own stress reactions. But you can mitigate the effects of stress reactions; stress management information is available in the ALPA-Int CIRP Guide which is available in the member's area of the IFALPA website. If you want to find out more about the CIRP or how you can develop a CIRP at your association, contact me through IFALPA's Human Performance Committee.



Louise has been the ALPA National CIRP Chairman for the last two years. She holds the CIRP portfolio for IFALPA and assists airlines around the world in developing their own CIRP program. Currently, Louise is a pilot for Mesa Airlines, flying the CRJ200 and CRJ900 out of Phoenix. Her interest in intervening in cases of grief, shock, and distress goes back to an early course in thanatology. She continued her experience by volunteering at the American Cancer Society in Michigan and at her university after the crash of Northwest flight 255 in Detroit. With over 20 years of grief experience, she continues to volunteer her time in her hometown of Steamboat Springs, Colorado, where she is called upon to assist the community in dealing with tragedy and loss.



Have an idea for an article or want InterPilot to cover your story? Contact Gideon Ewers, Tel. +44 1932 579041 or email gideonewers@ifalpa.org

Dates for your Diary

February

No meetings scheduled

March

15

20th Executive Committee Meeting

Marrakech

Contact: Heather Price heatherprice@ifalpa.org

15-17

20th Executive Board Meeting

Marrakech

Contact: Heather Price heatherprice@ifalpa.org

19-23

65th Conference

Marrakech

Contact: Heather Price
heatherprice@ifalpa.org



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21st Executive Committee & Board Meeting

Marrakech

Contact: Heather Price heatherprice@ifalpa.org

April

No meetings scheduled

May

3-5

Accident Analysis & Prevention Committee Meeting

Amsterdam

Contact: Arnaud du Bedat arnauddubedat@ifalpa.org

17-19

Security Committee Meeting

Sydney

Contact: Arnaud du Bedat arnauddubedat@ifalpa.org

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