



# On the edge

How do you stop major life events affecting your performance on the flight deck?

**Dr Graham Edkins  
& Daniel Fowler**

IT'S 8:20AM and you have just signed on for a three-day pattern of flying, which involves a few short sectors up and down the East Coast. As a captain you have spent the previous three days off duty at home and should be well rested. After completing the first sector, you inadvertently retract the flaps from 5 to 1 when "gear up" is called.

The aircraft's speed is above minimum flap retraction speed and you ascertain that no flight path degradation has occurred. You monitor the flight path and carry out normal clean up procedures after the aircraft reaches 1,000ft.

This incident was self-reported by the crew involved. The subsequent inquiry commended both pilots for self-reporting this incident, in the interests of flight safety.

Investigation of the incident found that the aircraft taxied for departure, with some showers in the area. There was no inducement by ATC to expedite the departure and the crew

recall being in the lined up position and determining that the assigned heading would keep them clear of weather to the left. The first officer (pilot flying) conducted the take-off and upon hearing "positive climb" called for "gear up".

The captain recalls placing his hand on the flap lever, checking that the airspeed was in excess of  $V_2+15$  and moving the flaps to 1. Approaching 1,000ft the flight crew realised that the gear was still down and the remainder of clean up was completed.

The captain revealed that a number of life stress problems may have affected his performance on the day. He had recently suffered significant financial loss from a bad investment. In addition, he reported that in the 24 hours prior to sign on, he had received broken sleep because of his young son.

It is clear from this event that a combination of fatigue and the stress associated with financial concerns had an impact on flight crew performance and mental health inside the cockpit.

Often stress in the cockpit is only recognised

in terms of cognitive stresses, such as high mental work load, caused by piloting modern transport aircraft in congested airspace. This helps perpetuate the myth that we can compartmentalise our professional and private lives, trying to quarantine one from ever impacting the other.

**Carry-on baggage:** Any changes in personal circumstances such as divorce, marital separation, difficult family affairs or financial difficulties can be a source of life stress and can form part of any pilots emotional "carry on baggage". Flight crew are particularly susceptible to these stressors. For example, long periods away from home and job insecurity caused by regular medical and proficiency checks can contribute to a feeling of stress. In addition, there are constant commercial pressures, real or imagined, such as the need to stick to deadlines, be economically conscious, and always project the right "image" to passengers and other operational staff. This cocktail of issues, when not dealt with properly, can lead to job dissatisfaction, reduced work effectiveness, behavioural changes, health damage and in



some cases depression.

**Peer pressure:** To complicate matters further, admitting to suffering from stress is often viewed by peers and society at large as an admission of weakness or failure. Therefore early telltale symptoms such as depression or sleep disruption are often denied by the individual or even worse, the individual resorts to unhealthy mechanisms such as aggressiveness or drug or alcohol abuse as a means of coping with stress.

Such behaviour generally leads to further reduction in performance and severe career implications. Therefore, it is important that individual flight crew and company management are aware of this potential problem and the effects it can have on operational performance.

In light of this, it is not surprising that several studies over the past few years have examined whether there are particular stressors that are more likely than others to precipitate an aircraft accident.

Robert Alkov, an aviation psychologist, studied flight related mishaps in the US Navy during the early 1980s. Alkov investigated the psychological background of over 500 US Navy flight crew members involved in aircraft inci-

dents and accidents. The study showed that various situational factors, such as recently getting engaged, or being involved in disputes with loved ones, peers or authority, significantly predisposed aircrew to involvement in accidents where human error was a contributory factor.

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While his findings indicated that there are substantial differences in the ability of pilots to cope with stress, the study concluded that many of the errors committed by flight crew were symptoms of inadequate stress coping behaviour.

Alkov based his study on work conducted

by two psychiatrists, Thomas Holmes and Richard Rae, who found that many diseases in their patients were caused by changes in life events.

By testing thousands of people, Holmes and Rae were able to identify 43 events that seemed to be especially stressful and rank them according to their disruptive impact. A severity level (stress points) was then assigned to each event. The stressful life events scale has been modified to produce a stress quiz (see page 33). **Managing stress:** Each individual should develop stress coping mechanisms that work for them. These may be as simple as a regular exercise routine, a massage, or talking issues over with a friend or loved one. However, if you are unable to deal with daily stress in an informal way, or have experienced a life changing event such as a death or family break up which you feel you are not coping with, there are a number of other avenues currently available to pilots.

Many larger airlines offer free and confidential counselling services to staff with safety-critical responsibilities. If you feel uncomfortable requesting assistance from your airline, your union may also be able to offer assistance or refer you to someone who can.



## WEB SITES

### Web Counselling

[www.webcounselling.com.au](http://www.webcounselling.com.au)

Online counselling sessions with registered psychologists. An alternative for people who may be uncomfortable with the intimacy of face-to-face counselling.

### Mind Tools – How to Master Stress

[www.psychwww.com/mtsite/smpage.html](http://www.psychwww.com/mtsite/smpage.html)

A comprehensive site on understanding and managing stress.

### How to survive unbearable stress

[www.teachhealth.com](http://www.teachhealth.com)

A light hearted and easy to read treatment of the mechanisms behind stress; and ways of dealing with over-stress.

## Six steps to successfully manage stress

### 1. Identify sources of stress.

You could be stressed by major events (see our stress test opposite) or other factors. Keep a diary to record what events or activities strain your energy and time, trigger anger or anxiety, or result in physical symptoms, such as headache or insomnia. After a couple of weeks, you should be able to identify clues to the sources of your stress.

### 2. Discuss problems with a friend, counsellor or psychologist.

This helps give a sense of perspective and can help maintain optimism. Middle-aged men under severe stress who lack emotional support are five times more likely to die within a seven-year period than those who have the same amount of stress but have support. A doctor should be consulted if there are accompanying physical or psychological conditions, such as cardiac symptoms, pain, anxiety or depression.

### 3. Formulate strategies to cope.

If the source of stress is under your control, try to minimise the effects. If the stressor is outside of your control, seek help to consider how you might best deal with its negative effects; the key is to develop realistic plans and act on them. Sometimes it's not possible to eliminate the source of stress, such as the death of a spouse. Remember, reducing stress and keeping relaxed not only helps maintain health but gives the mind more opportunities for clearer thinking.

### 4. Maintain a balance.

Shift the balance from stress producing to stress reducing activities. Recent studies have indicated that daily pleasant events have positive effects on the immune system. In fact, adding pleasurable events has more benefit than simply reducing stressful or negative ones.

### 5. Exercise, eat well and sleep

General health and stress resistance can be enhanced by eating well. Exercise also enhances the body's ability to withstand stress. A good night's sleep can help rebuild the body's resources and gain perspective on problems. If stress is causing insomnia, seek professional help.

### 6. Take regular opportunities to relax.

One major obstacle to reducing stress is the "fight or flight" response itself; the very idea of relaxation feels threatening, because it is seen as letting down one's guard. This can result in a build-up of stress. Make time for those things you enjoy, or try some proven stress reducing techniques:

**Deep Breathing:** During stress, breathing becomes shallow and rapid. Taking a deep breath is an effective technique for winding down. Inhale through the nose slowly and deeply to the count of ten, making sure that the stomach and abdomen expand but the chest does not raise up. Exhale through the nose – slowly and completely – also to the count of ten. Repeat five to ten times.

**Muscle Relaxation:** After lying down in a comfortable position without crossing the limbs, concentrate on each part of the body, beginning with the top of the head and progressing downward to focus on all the muscles in the body. Breath slowly and deeply. Tense each muscle as tightly as possible for a count of five to ten and then release completely. Practice makes the exercise much more effective and produces relaxation much more rapidly.

**Meditation:** The goal of all meditative procedures is to quiet the mind – essentially to relax thought. With practice you can reduce heart rate, blood pressure, adrenaline levels, and skin temperature while meditating. A number of organisations teach meditation.

**Massage Therapy:** Massage therapy appears to slow down the heart and relax the body. A number of massage therapies are available for relaxing muscles, including shiatsu, reflexology and Swedish massage. Learning to control stress contributes to better health and a greater ability to succeed on your own terms. Professional psychologists and counsellors can point you to some very successful stress management programs.

Adapted with permission from Nidus Information Services Inc: "Well-connected Report: Stress", by Harvey B. Simon, MD, Editor-in-Chief, September 1999. ([www.well-connected.com](http://www.well-connected.com))

Call for help: Qantas pilots can access counselling either through the organisation's HR department or the pilot's union, the Australian and International Pilot's Association (AIPA). The welfare section at AIPA offers services for long- and short-haul pilots and their families.

The organisation is staffed by volunteer flight crew who are available to listen to, and discuss problems as required. If necessary, the union can also help members obtain professional help from a psychologist.

Ansett pilots can access free and confidential counselling through the organisation's chief medical officer. The union, the Ansett Pilots' Association, can also put members in touch with other pilots who are available to listen to and discuss problems. If requested, the union can also act as a confidential intermediary between the member and the company.

If your company does not offer counselling services or you are not a member of a union you can contact the Australian Psychological Society's referral service on 1800 333 497. The service is staffed by trained psychologists who can refer you to specialists in your region.

Fit to fly? While the resources discussed here do not pretend to provide all of the support you may require in times of need, they do provide a starting point for referrals to other services and all of the organisations mentioned above maintain links with relevant community organisations.

The important issue here is that stress should be dealt with in healthy ways, before it is allowed to adversely affect your personal or professional life. What's important is not the source of stress, but how you as an individual choose to respond to it. We all have the option to consciously choose to deal with our stress in pro-active and constructive ways.

While it is often very important to talk to peers, if you notice sudden changes in their personality or behaviour, be aware that in helping that person to deal with unresolved problems, the ultimate responsibility for personal health rests with the individual.

It is also important to remember that this responsibility applies not just to physical well-being, but also mental well-being. At times of personal upheaval always stop before entering the cockpit and ask yourself: "Am I really fit to fly?"

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# Stress quiz

How stressed are you? This stress test lists a number of life events, which can affect your stress levels. Go down the list and add up the scores for those events you have experienced in the last twelve months.

LIFE EVENTS	POINTS	SCORE
1. Death of spouse	100	
2. Divorce	60	
3. Menopause	60	
4. Separation from living partner	60	
5. Jail term or probation	60	
6. Death of close family member other than spouse	60	
7. Serious personal injury or illness	45	
8. Marriage or establishing life partnership	45	
9. Fired at work	45	
10. Marital or relationship reconciliation	40	
11. Retirement	40	
12. Change in health of immediate family member	40	
13. Work more than 40 hours per week	35	
14. Pregnancy or causing pregnancy	35	
15. Sex difficulties	35	
16. Gain of new family member	35	
17. Business or work role change	35	
18. Change in financial state	35	
19. Death of close friend (not family member)	30	
20. Change in number of arguments with spouse or partner	30	
21. Mortgage or loan for major purpose	25	
22. Foreclosure of mortgage or loan	25	
23. Sleep less than 8 hours per night	25	
24. Change in responsibilities at work	25	
25. Trouble with in-laws, or with children	25	
26. Outstanding personal achievement	25	
27. Spouse begins or stops work	20	
28. Begin or end school	20	
29. Change in living conditions (visitors, renovating, etc)	20	
30. Change in personal habits (diet, exercise, smoking, etc)	20	
31. Chronic Allergies	20	
32. Trouble with Boss	20	
33. Change in work hours or conditions	15	
34. Moving to new residence	15	
35. Presently in pre-menstrual period	15	
36. Change in schools	15	
37. Change in religious activities	15	
38. Change in social activities (more or less than before)	15	
39. Minor financial loan	10	
40. Change in frequency of family get-togethers	10	
41. Have been or are about to go on holiday	10	
42. Presently in Christmas Seasons	10	
43. Minor violation of the law	5	

## What your score means

Although different people cope with stress differently, for the average person, a score of 250 points or greater may indicate high levels of stress. If your score is 300 points or more the likelihood of illness is increased.

Keep in mind that people cope with life events very differently. For example, while divorce is near the top of the scale (60), the event may be seen as positive if the split is amicable and does not involve children. The message for flight crew is clear. If stress brought on by life events is not well managed, and is added to the stress of operating aircraft, your performance might be affected.

*Adapted from the "Social Readjustment Rating Scale" by Thomas Holmes and Richard Rae. This scale was first published in the "Journal of Psychosomatic Research", Vol. II, p. 214.*

# Cockpit overload



## How to reduce your chances of becoming stressed in flight.

**Dr David Newman**

**A** SOLO student pilot is on a cross-country flight from Scone to Bankstown. The enroute weather begins to deteriorate, and the pilot contemplates an alternative route. At the same time, the normally reliable engine starts to run a little rough. This is quickly compounded by increasing uncertainty over the aircraft's exact location. Sweaty and with a racing heart, the pilot begins to feel increasingly unable to cope with a situation going from bad to worse. These symptoms are all manifestations of stress, caused by the demands of this serious, high workload situation.

How the pilot manages his, or her, stress will likely determine whether the flight ends up the subject of a mildly interesting story told to his instructor after the flight, or rivetting reading in the pages of the ATSB's annual summary of aircraft accidents. Stress, workload and performance are all very closely related. The problem with stress is that it reduces our performance in situations of high cockpit workload – the time when we need our

performance to be as good as it can be. And stress feeds stress – we feel more stressed as workload increases, and that reduces our performance. Because our performance has dropped we accomplish less tasks which creates an apparent increase in workload, which in turn leads to increased levels of stress.

**Practice and training:** The stressed pilot, trying to juggle several time-critical things at once, starts to randomly shed tasks to allow his mind to focus on the tasks that seem more important. Increasing numbers of errors are made both in execution and judgement. This can extend to a point where the pilot may actually begin to see and hear less – messages received by the eyes and ears are simply not processed by the brain. The pilot becomes selectively blind and deaf. This phenomenon is known as increased attentional selectivity and it has led to several instances of pilots being completely oblivious to visual and aural warnings of impending disaster.

So how do we reduce our susceptibility to stress? One way to do this is through practice

and training. This improves our skill level, which frees up significant spare processing capacity. This in turn leads to lower overall workload, less chance of fundamental operator error and an increased ability to deal with emergency situations.

By improving our skill level we can convert certain tasks into motor programs. A motor program is a behavioural subroutine that requires minimal processing resources. Changing gears in a car is a good example. First-time drivers have to expend significant mental energy to depress the clutch, select the appropriate gear, change the gear, release the clutch and depress the accelerator. Experienced drivers perform the same task without making a single conscious thought.

In the absence of a motor program, a task may be demanding all of an individual's available processing resources. Consider as an example a pilot with a brand-new instrument rating flying in IMC. In this situation the pilot may be using all available processing resources to control the aircraft and maintain



the appropriate tracks, headings and altitudes. The pilot's performance may be pretty good, despite the high workload. What happens if the pilot now experiences some form of in-flight problem? What if the engine starts to run a little rough, or the electrics drop off line?

The pilot has no new resources to devote to this new problem. The aircraft problem must be sorted out, but in diverting some resources to this new problem the pilot may suffer a deterioration in instrument flying.

The development of motor programs is not free of potential problems. Studies have shown that in high workload situations an inappropriate motor program can be activated. This is especially true when the majority of mental resources are being directed to other activities.

As an example, consider the pilot with thousands of hours on a particular aircraft type who is converting to a new and different type. That pilot brings to the new cockpit all of the motor programs and skills developed through experience in the old cockpit. If an emergency occurs in the new aircraft, a motor program appropriate for the previous aircraft, but not appropriate for the new one,

may be activated, with serious consequences.

Another factor that can reduce the incidence of stress is pre-flight planning. And that means more than just checking the weather and NOTAMs and submitting a flight plan. Pre-flight preparation should include a consideration of possible problems that could occur on each flight and detailed strategies for handling those problems successfully. Do I have a contingency plan if the vacuum pump fails during an instrument approach? Which instruments will be affected? Am I capable of flying a partial panel approach? Do I have sufficient fuel to divert to an airport where a visual approach could be flown?

By thinking things through before they happen you free up spare processing capacity and greatly reduce the chances of finding out just how badly you perform at your stress threshold.

Just as high workload can have a negative impact on pilot performance low, workload can also lead to increased pilot error. While the modern automated flightdeck can reduce the possibility of a pilot becoming overloaded with excess tasks, it can also cause decreased arousal and reduced performance. There is an optimum level of workload that leads in turn to

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an optimum level of performance. What can you do to counter the potential problem of low workload on the automated flightdeck? The simple answer is to find something to do. The task need not be critical to the safe operation of the aircraft, just something that you can do to keep your workload in the optimum range.

For some pilots, automation can also lead to stress due to a feeling that they are less in

control of the aircraft. Pilots who are not as skilled or familiar with modern flight deck systems may experience a higher workload than others as they attempt to manage and operate automated systems.

This in itself can create increased levels of stress and lead to selective attention problems and errors. Those pilots can become so focused on the equipment that they no longer pay attention to the aircraft's flight path, for instance. The pilots may well be heads-down in the cockpit, saying, “I didn't know it could do that!” or “What's it doing now?” while the aircraft spirals down. This issue comes back to proper training and development of high skill levels in the use of equipment.

**Strategies:** While long-term strategies for stress management – training, education, practice and experience – are the most effective in reducing the likelihood of a pilot suffering the deadly effects of stress, there are some things you can do in the short term to address the issue.

A few slow, deep breaths will help initially, followed by an objective appraisal of your situation. Task prioritisation is also important. What is the biggest problem you are facing now? This is where the adage “aviate, navigate, communicate” comes in useful. Critical tasks must be performed first (like maintaining altitude) before less-critical tasks (like routine position reports).

Ask ATC for help – radar vectors may give you more opportunity to address more pressing aircraft problems. Try to keep calm and don't panic. In the end, you can only do so much – you need to ensure that you do the really important things first.

Stress, workload and performance are all very closely related. If one of these factors changes the other two are likely to change as well. There is no substitute for skill in the flight environment and practice is the key to improving skill levels. Stress and workload are part of flying. Being aware of them, and learning how to manage them, are important aspects of being a safe and skilled pilot.

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