認知功能下降

有些較高齡飛行員極力想對這項隱伏威脅做出正確回應

歐文 譯

儘管大約70%失事事件係人為因素所致，但在談及確保商業航空安全時，航空業者會偏重於飛機的適航性而非飛行員的認知健康。

虛擬航醫創始人兼總裁Quay Snyder博士表示:「普遍存在於較高齡飛行員中的認知功能下降問題對飛安是一種威脅，與疲勞及物質濫用類似。」如同疲勞及物質濫用的影響一樣，認知功能不足是隱伏的，對表現會有相當的負面影響，而且飛行組員在執行例行活動時最難辨認。症狀未被注意的一個原因是，透過練習及例行活動，大腦會調整適應輕度至中度的認知損傷。換言之，正常活動可以掩飾缺陷的嚴重程度。

然而，如果飛行組員的例行工作遭遇緊急或充滿壓力情況干擾，像是飛行中緊急情況、或飛行途中許可情況發生變化，則認知損傷的程度就會變的更明顯。不幸的是，即使那些狀況有時候會被兩位飛行員淡化為無關緊要的異常罷了。

自1956年以來，600多位年紀從22歲到超過100歲的成年人參與了由心理學家和老年病學家K. Warner Schaie博士所主持的西雅圖縱向研究(Seattle Longitudinal Study, 簡稱SLS)。該項研究依據參與者的年紀老化觀察研究他們在各方面與律定標準所產生之變化差異，來追縱他們認知表現。該研究聚焦於6項關鍵因素之認知表現(以下定義係臨床術語解釋):

- 歸納推理 - 解決問題
- 空間定位 - 對周圍環境的理解
- 速度知覺 - 了解速度
- 數字能力 - 數學解題速度及準確度
- 口語能力 - 會話能力
- 言語記憶 - 聽覺記憶輸入

對飛行座艙任務的安全表現而言，這些因素的每一項均被認為是關鍵的認知元素。表1顯示了研究群組的平均

表現。個別變化率不同，正反都有。

Schaie博士的發現顯示，平均而言，認知技巧可維持至60歲左右。口語技巧能力遠高於空間定位與速度知覺。換言之，雖然其他方面錯誤率增加，但仍很可能持續不自覺。

認知下降是一項真的威脅，還是僅為學術上的擔憂?4月出席由世界飛安基金會在聖地牙哥所舉辦的2014商業航空安全高峰會議中，提報這項主題時，我運用電子計票軟體以獲得參與者針對相關問題所映之意見、態度及觀點。回應問題人數從剛開始的72到最後的115。

當你檢視這些結果時，請記得這些回應者皆以飛安為重且代表願意大量投資以促進其飛安努力之組織。因此，統計數據無法代表整個產業。他們的回應對風險管理的關切程度具有高於平均值之偏好。因此，個人相信你可以認為一個更具代表性之團體的回應會更偏向風險容忍。

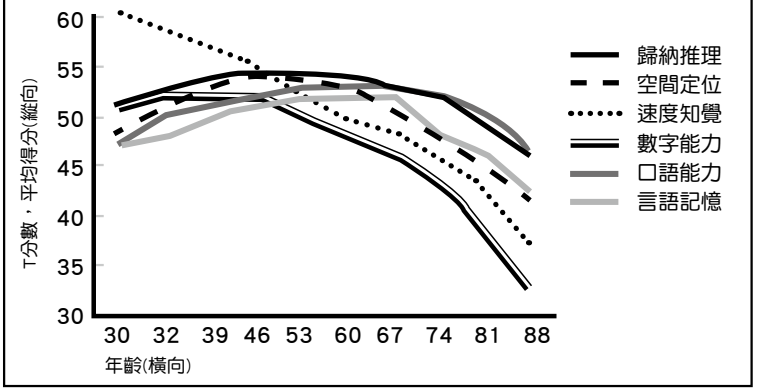
我問的第一個問題是:「就你個人經驗中，較高齡飛行員因認知功能下降而產生風險有多嚴重?」換言之，我解釋，誰相信他們真正見證過認知功能下降而產生低於標準的表現? 82%的回應者指出風險為中度至高度(參見表2)。

以這種關切程度，個人認為這個議題應早已獲得航

空安全專業人員的重視處理。事實上，規定確實企圖涵蓋這個問題的所有層面。舉例而言，美國FAA及歐盟都為航空公司飛行員設下強制退休的年紀。這些規定的目的係在為機組人員老化相關風險設下限制。

然而，這也是一項通盤性的作法，因為每個人狀況不同。我有很好的飛行員朋友不到60歲就因阿茲海默症而過逝。我也觀察到我的85歲父親，他是一位退休軍方及民航飛行員，爬進配備側邊操縱桿及玻璃座艙顯示器(第一次碰到)的陌生飛機內。在五分鐘內，他就能操控飛機，並輕鬆地在2至3度範圍內保持飛機的航向，且限制高度偏離在30呎內。隨意限制飛行機組員年齡規定不但可能無法達到早期防止認知功能減退的發生，而且也不允許那些雖然年紀大，但仍可完全勝任的機組人員繼續他們的職業生涯。

表1：較高齡飛行員認知功能下降



繪製線顯示出參與者在潛在能力方面的年齡變化之縱向估計（從7年的縱向數據）
來源：西雅圖縱向研究:個性與認知之關係(作者:Warner Schaie, Sherry L Willis及Grace IL. Caskie<www.ncbi.nlm.nih.gov/pmc/articlesPMC1474018/>.

美國FAA部分依賴聯邦航空法規第61.53條之規定，該規定提及「依第67條規定取得體檢證明者，若知悉或有理由知悉健康情況無法符合體檢證明要求時，不得擔任飛行組員。」

有些商業航空業者另外採行進一步解決較高齡飛行員議題之政策及作法。這種主動提案通常係因高階主管之關切所致。其他業者表示關切這個議題，但因一些防止就業歧視和違反醫療隱私的州和聯邦法律而不敢採取主動作為。出席商業航空安全高峰會議的與會者接受了有關其公司處理較高齡飛行員議題政策之調查。64%的人指出公司並無相關政策，而僅18%指出其公司政策似可適切的處理這項議題(參見表3)。

即使已有政策，但業者如果沒有可以讓政策有效執行的組織標準及行為規範，那將無法免於認知缺陷之風險。這引發了一些具有挑戰性的問題。

基於以下數項理由，自我報告不太可能成為政策執行之可靠方式。

- 認知損傷就像酒精或藥物損傷一受影響者對情況之瞭解通常較不如其週邊人員。當一家庭成員或朋友基於這項理由而準備敦促某人不要駕車時，通常早已超過失能之地步。
- 對許多飛行員而言，飛行是一項興趣也是職業。這是他們個人認同感的一部分。非常害怕失去這種連結關係 -大到足以讓人否認他們可能把自己和別人置於危險中。
- 許多飛行員在經濟上並未作好退休或轉換行業的準備。這種強大的財務壓力致使他們必須繼續飛行。

航空業者無法依賴自我報告，作為識別犯有嚴重認知功能減弱之機組員的主要方式。

如果自我報告不是解決辦法，那是否應該找一個更具侵入性的管制辦法?我問與會人員他們認為現行規定是否可有效處理有關認知功能下降的風險。94%的人持否定態度。合理的下一步應該是要求改變規定以期能更有效處理這項議題。在美國，那些規定最可能經由FAA的航醫(AME)網絡來執行。然而，根據與我交談過的不同飛行員之看法，這仍有缺點，因為要在網絡中要找到航醫檢查不是太完整的並不難。因此，飛行員的變通辦法便是選擇一位這樣的航醫，而讓這種方式很容易就無法發生效用。

沒有認知功能之監管保證，航空業者僅能以政策及表現考核來處理這項威脅。

要求飛行員當同行機組人員被懷疑有認知障礙時即通知管理部門，倒是一個可能的政策。這聽起來合理，畢竟有誰可以比鄰座的同仁更能實際觀察低於標準之表現呢?

然而，僅運用這種方式檢測有關認知功能下降之風險仍有其挑戰。

就定義而言，商業航空的單一飛行員作業通常沒有另一名合格飛行組員來觀察飛行員的表現。這讓乘客成為飛行員表現之主要觀察員，但早在飛行員表現下降到讓大部分乘客警覺時，乘客很可能已處於危險中。

由於單一飛行員作業僅佔所有航空業務的一小部分，

因而很容易遭到忽視。然而，隨著超輕型噴射機及高性能、加壓與單引擎渦輪螺旋槳飛機持續湧現，將導致這部分業務的成長，而風險也會隨之增加。

就雙飛行員作業而言，業者的政策可強制規定任何觀察員將其關切向經理人員報告。然而，假若顯現下降的人是該部門之資深經理人員，則這項政策的效果會如何?或若較高齡飛行員是飛行啟蒙師父並且請觀察者通融一下呢?

其他有關揭露政策之關切事項還有觀察員對法律、財務及社會曝光之恐懼。就另一層次而言，揭露者對參與一系列事件而可能導致飛行員意外結束飛行生涯並突然喪失收入會有潛在悔恨。

因此，結構性及社會障礙對這個獨立政策成效的影響很大。這就是為什麼正義文化的充分融合可形成有效緩解較高齡飛行組員認知功能下降之相關風險的基礎。

安全理論學家James Reason就文化對組織安全表現之衝擊方面的各種著作論述乃屬開創性，而且不斷發展。他的創立定義為：

在公正文化中，錯誤及不安全行為不會受到懲罰，如果這錯誤不是故意的。然而，那些行為魯莽不計後果或採取蓄意而不合理風險者仍會受到懲戒處分。

在會中調查時，我問及「公正文化對處理老齡飛行員風險之重要性如何?」結果反應熱烈，96%回應者表示公正文化對處理這個問題很重要(參見表4)。

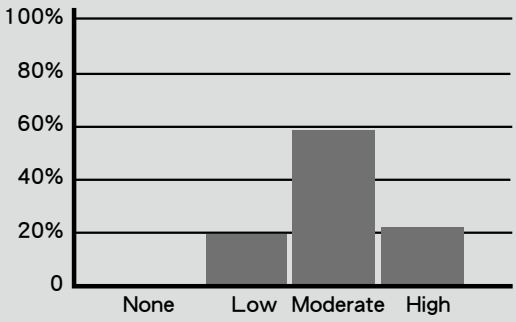
接著，我探詢了出席會議成員所代表之組織的公正文化現況及執行力度。

這兩個反應揭示，儘管這些與會者普遍瞭解公正文化價值對組織表現品質之影響，但在已實施公正文化信條之組織的回應者中，不到10%同意其組織確保這些信條是有效的。為了讓公正文化能夠發揚，必須全面貫徹應用。否則，就定義及現實而言，它是既不公正也不是真正有效。

對於為何及如何實現公正文化的良好敘述，請參閱世界飛安基金會的2005年3月份飛安摘要雜誌的文章「正義文化路線圖一強化安全環境。」這篇文章係由全球航空資訊網絡(GAIN)工作小組E所彙編，內容強調的重點之一為「當有人提報危險因子時，這些危險因子會透過以危險為基礎的方法進行分析，並採取適當行動。」這句話涵蓋了以績效考核為基礎，並可作為有效處理組員認知功能下降威脅的解決方案。

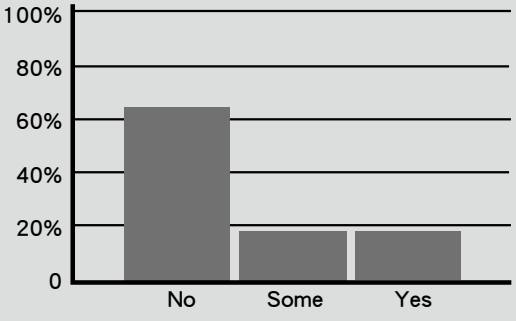
另一合理評估飛行員認知的方式是讓培訓公司將其納入複訓課程中。事實上，一位大型包機管理公司的總裁在

表2:較高齡飛行員風險有多嚴重?



註：2014年4月商業航空安全高峰會議與會者調查結果
來源：Peter v. Agur, Jr.

表3有無處理較高齡飛行員風險的政策?



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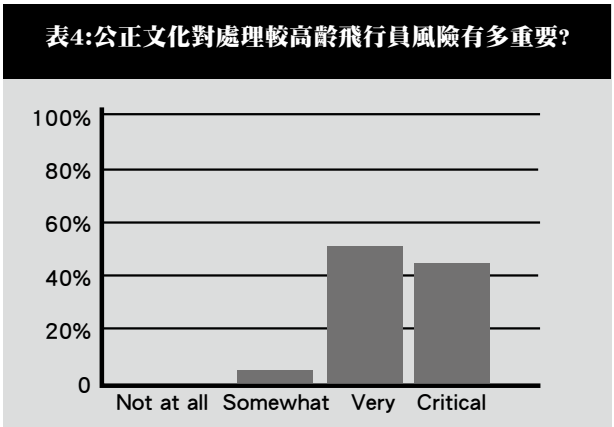
10年前即提出此項要求。他詢問一家主要培訓公司的執行長說，該公司之幕僚是否能設計並對其包機管理公司之飛行組員的認知功能進行診斷。獲得的回答是「可以，但我們不做。」理由有二：市場行銷及法律問題。該管理公司總裁又向另一重要培訓公司探詢，結果答案相同。

有鑑於尚無確立之模式，我提供下列觀點作為解決有關飛行組員認知表現之處方。就像所有食譜，跳過步驟和使用劣質替代品會導致最終產品走樣，而且通常變差。航務部門必須與人力資源及法務部門合作以確保政策及做法是公平且正當有理。倘若業者內部不具備專業知識來制定這類政策及做法，應該運用外部專家。

以下提議內容為確保認知功能之步驟綱要，並以採用航醫及其他在此項領域合格之保健專家的專業意見為前提:

- 建立並維持全面性的正義文化。這可為自我報告，及觀察員報告明顯且持續異於正常預期之認知表現的基礎。
- 為下列事項建立並適用於所有飛行組員之政策:



註：2014年4月商業航空安全高峰會議與會者調查結果
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—公司核可航醫選擇及運用;
—獲得喪失證照及殘疾保險，以確保缺陷遭確認時之公平性。

- 堅持運用那些有效的認知評估工具及測試:
  —可以廣泛使用線上、書面及實際測試;
  —執行例行性的認知評估，以建立基礎線及確認變化;
  —發展並持續管理內容含括已驗證且可輕易觀察與記分之認知評估的定期飛行模擬機考核;
  —由內部觀察員或顧問負責飛行模擬機之考核。
- 當發現有重大差異變化時，執行額外且更深入診斷以判定該項差異變化是否為:
  —因疲勞、暫時或可治療身體狀況、或藥物等所造成的短暫情況。解決短暫變化的問題根源，並讓航醫再確認是否適合回到工作崗位上;
  —長期而且漸進的。
- 當確認認知功能下降嚴重到影響飛安，而且無法改正時，以人道及公平態度處理：
  —運用現有的喪失證照保險金;
  —運用補充的傷殘保險金，補償收入差距;
  —提供與職業相關及個人的輔導;
  —考慮在飛行部門提供他(她)一個非飛行職缺。
- 如果確定必須離職，考慮公開彰顯其貢獻與成就，藉以協助他/她個人及該部門最大可能之順利轉變。

Snyder表示：「較高齡飛行組員之認知功能下降對飛行運作風險不可忽視。」目前美國尚無確保商業航空飛行員認知功能的適切管理或保障機制。因此業者必須自行採取因應作為。

作者：Peter v. Agur Jr.為The VanAllen 公司總裁及創始人。該公司主要業務為提供飛安、飛機獲得、主管甄選及培養方面的商業航空諮詢。作者為飛安基金會商業諮詢委員會及國家商業航空協會(NBAA)企業航空經理人委員會(名譽)會員，擁有MBA及航空運輸飛行員執照，並為NBAA認證之航空經理人。

譯自 Aero Safety Worle Oct 2014

COGNITIVE DECLINE

Some aging pilots struggle to respond appropriately to this insidious threat.

PETER V. AGUR, JR

When it comes to assuring safety in business aviation, operators can become more focused on the airworthiness of the aircraft than on the cognitive health of pilots, despite estimates that about 70 percent of accidents are the result of human factors.

"Cognitive decline, most prevalent among aging pilots, is a threat to safety that is similar to fatigue and substance abuse," says Dr. Quay Snyder, president and founder of Virtual Flight Surgeons. Like the effects of fatigue and substance abuse, cognitive deficiencies are insidious, have a substantial negative impact on performance and are hardest to identify when the crewmember is performing routine activities. One reason symptoms go unnoticed is that with practice and routine, the brain adjusts to mild to moderate cognitive impairment. In other words, normal activities can mask the severity of the deficiency.

However, if the flight crew's routine is interrupted by an urgent or stressful situation, like an inflight emergency or an en route clearance change, then the extent of cognitive impairment may become more evident. Unfortunately, even those events are sometimes down-played by both pilots as an inconsequential aberration.

Since 1956, over 6,000 adults ranging in age from 22 to more than 100 have participated in the Seattle Longitudinal Study conducted by K. Warner Schaie, Ph.D., a psychologist and gerontologist. The study has tracked the cognitive performance, relative to variance from the established norms, of the subjects as they aged. The study focused on six key factors in cognitive performance (the definitions shown are interpretations of clinical terms):

- Inductive reasoning — problem solving;
- Spatial orientation — comprehension of one's surroundings;
- Perceptual speed — pace of understanding;
- Numeric ability — pace and accuracy of mathematical problem solving;
- Verbal ability — conversational competence; and,
- Verbal memory — recollection of aural input.

Each of these factors also can be considered a critical cognitive element for the safe performance of flight deck duties. Figure 1 displays the average of the study group's performance. Individual rates of change varied, both positively and negatively.

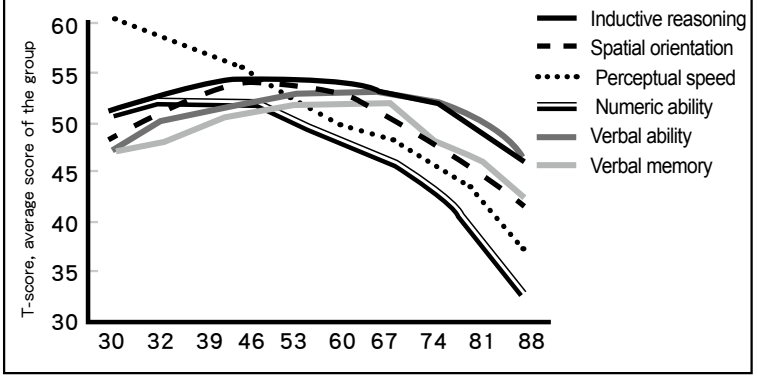
Schaie's findings show that, on average, cognitive skills remain good through age 60 or so. Verbal skills remain acute longer than spatial orientation and perceptual speed. In other words, as the error rate increases in other areas, the subject's ability to 'talk his way out of it' remains high.

Is cognitive decline a real threat, or is it purely an academic concern? While presenting this subject during

Flight Safety Foundation's 2014 Business Aviation Safety Summit (BASS) in April in San Diego, I used electronic polling software to solicit answers to questions that would reflect opinions, attitudes and perspectives of the attendees. The number of respondents ranged from 72, as we were beginning the survey, to 115 for the last question.

As you look at the results, remember that these respondents were already safety-focused and representing organizations willing to make significant investments in furthering their safety efforts. Therefore, the data are not representative of the entire industry. Their responses are biased by an above-average level of concern for risk management. As a result, I believe you can assume a more representative group's responses would be more risk-tolerant.

Figure 1 Aging Pilot Cognitive Decline



Note: Plotted lines show longitudinal estimates of within-participant age changes on the latent ability constructs (from 7-year longitudinal data).
Source: The Seattle Longitudinal Study: Relationship Between Personality and Cognition by K. Warner Schaie, Sherry L. Willis, and Grace I.L. Caskie <www.ncbi.nlm.nih.gov/pmc/articles/PMC1474018/>

The first question I asked was, "In your personal experience, how significant are the risks associated with cognitive decline in aging pilots?" In other words, I explained, who believed they had actually witnessed substandard performance that is characteristic of cognitive decline? Eighty-two percent of the respondents indicated the risks were moderate to high (Figure 2).

With that level of concern, I would assume the issue would have been previously addressed by aviation safety professionals. In fact, regulations do attempt to cover all the bases on this question. The U.S. Federal Aviation Administration (FAA) and the European Union, for example, both have set mandatory retirement ages for airline pilots. The use of regulations is an attempt to create a limit on the risks associated with aging crewmembers.

However, it is also a blanket approach to an issue that is unique to each individual. I have had dear pilot friends succumb to Alzheimer's disease before age 60. I also have observed my 85-year-old father, a retired military and airline pilot, climb into an unfamiliar airframe with a sidestick and glass cockpit displays (the first time he had encountered either). Within five minutes, he had the airplane 'wired.' He easily maintained the airplane's heading within two or three degrees and limited altitude deviations to less than 30 ft. An arbitrary, regulatory flight crewmember age limit may not catch the early onset of cognitive decline and does not allow older, but fully competent, crewmembers to continue their careers.

FAA partly relies on the provisions of Federal Aviation Regulations (FARs) Part 61.53, which says, in part that "no person who holds a medical certificate issued under Part 67… may act … as a crewmember, while that person: (1) Knows or has reason to know of any medical condition that would make the person unable to meet the requirements for the medical certificate."

Some business aviation operators have taken the added step of establishing policies and practices that further address aging pilot issues. This is an initiative often driven by senior executives' concerns. Other operators say they are concerned about the issue but are daunted by state and federal laws designed to prevent employment discrimination and breaches of healthcare privacy. The BASS audience was polled about the status of their companies' policies addressing aging pilots. Sixty-four percent indicated that no policies were in place, and only 18 percent indicated their policies appeared to adequately address the issue (Figure 3, p. 42).

Even with policies in place, operators are not protected against the risk of cognitive deficiencies without the organizational norms and behaviors needed to make the policies effective. That raises some challenging issues.

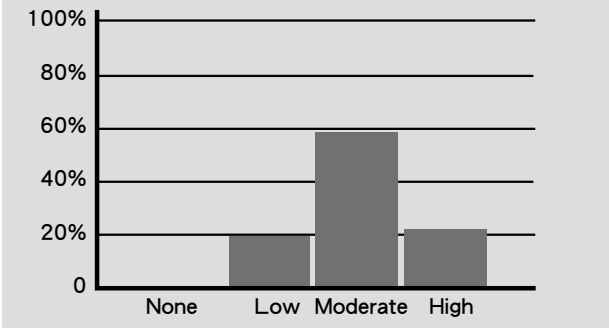
Self-reporting is not likely to be a reliable approach to policy implementation for several reasons:

- Cognitive impairment is like alcohol or drug impairment — the people affected are likely to be less aware of the condition than those around them. When a family member or friend is ready to urge a person to discontinue driving for this reason, it is usually well past the point of incapacitation.
- For many pilots, aviation is as much an avocation as it is a vocation. It is part of their sense of personal identity. The fear of losing that connection may be very strong — strong enough for people to be in denial that they may be putting themselves and others at risk.
- Many pilots are not prepared economically to either retire or change their careers. This puts strong financial pressure on them to continue to fly. Operators cannot count on selfreporting as their primary method of identifying a crewmember who is symptomatic of significant cognitive decline.

If self-reporting is not the answer, should we look for a more intrusive regulatory solution? I asked the BASS audience if they thought current regulations effectively addressed the risks associated with cognitive decline. Ninety-four percent answered "no." The logical next step would be to call for a change in the regulations to more effectively address the issue. In the United States, those regulations would most likely be implemented through the FAA's aviation medical examiner (AME) network. However, the flaw there is, according to a number of different pilots with whom I have spoken, it is relatively easy to find AMEs in the network that are less than comprehensive in their examinations. Therefore, the pilot's work-around— selecting such an AME — would be too easy for this approach to be effective.

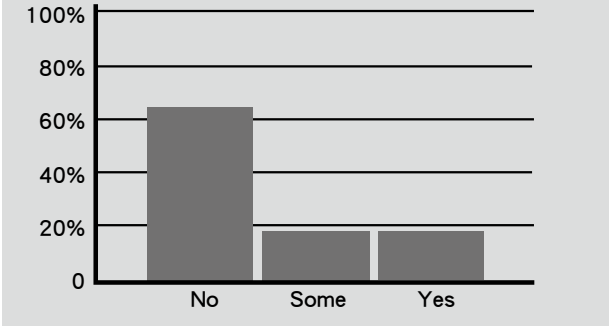
Without regulatory assurance of cognitive competence, the operators themselves are left with a blend of policies and performance assessments for dealing with the threat.

Figure 2 How Significant Are Aging Pilot Risks?



Note: Results of audience poll during the Business AviationSafety Summit, April 2014
Source: Peter v. Agur, Jr.

Figure 3 Do You Have Policies That Address Aging Pilot Risks?



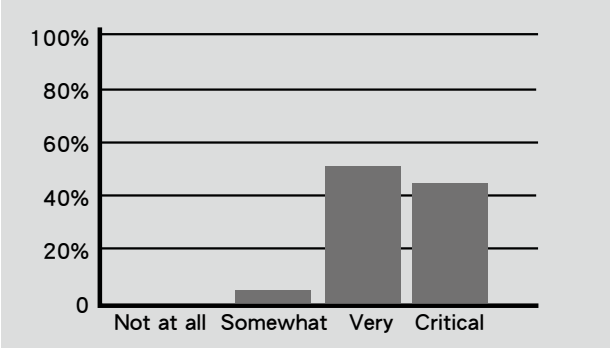
Note: Results of audience poll during the Business Aviation Safety Summit, April 2014
Source: Peter v. Agur, Jr.

A possible policy would call for pilots to notify management when a fellow crewmember is suspected of being cognitively impaired. This sounds reasonable. After all, who is more likely to actually observe substandard performance than the person in the other seat?

However, there are challenges to using this approach alone for detecting the risks associated with cognitive decline.

By definition, the single-pilot operations in business aviation typically do not have another qualified flight crewmember to observe the pilot's performance. That leaves the passengers as the primary observers of the pilot's performance, but they are likely to be at risk long before a pilot's performance declines to a level that would cause most passengers to notice.

Figure 4 How Important is a Just Culture in Addressing Aging Pilot Risks?



Note: Results of audience poll during the Business Aviation Safety Summit, April 2014
Source: Peter v. Agur, Jr.

It is tempting to ignore single-pilot operations as an issue because they comprise a tiny fraction of all business aviation operations. However, the continued emergence of very light jets and high-performance, pressurized, single-engine turboprop aircraft will cause this segment to grow. The risks will grow with it.

In two-pilot operations, the operator's policy could make it mandatory for any observers to report their concerns to their manager. How effective would that policy be if the person who is demonstrating decline is the senior manager of the department? Or, what if the fading flyer is the mentor and "bestower of breaks" to the observer?

Other concerns about disclosure policies include fear of legal, financial and social exposure for the observer. On a higher level, disclosers indicated potential remorse at being part of a series of events that would lead to the unplanned end of a pilot's flying days as well as the sudden loss of his or her income.

The structural and social barriers to a standalone policy's effectiveness therefore are substantial. That is why the full integration of a just culture forms the foundation for the effective mitigation of the risks associated with cognitive decline in aging flight crewmembers.

Safety theorist James Reason's extensive work in the arena of cultural impact on an organization's safety performance was ground breaking and continues to evolve. His founding definition is:

In a just culture, errors and unsafe acts will not be punished if the error was unintentional. However, those who act recklessly or take deliberate and unjustifiable risks will still be subject to disciplinary action.

During my BASS audience polling, I asked, "How important is a just culture in addressing aging pilot risks?"

The response was overwhelming: 96 percent of respondents said a just culture was important in addressing the issue (Figure 4).

I then probed the status and strength of just culture in the organizations represented by audience members.

These two responses reveal that, despite this audience's nearly universal understanding of the value and impact of a just culture on the quality of organizational performance, fewer than 10 percent of respondents whose organizations have implemented just culture precepts agreed that their organization actually ensures that they are effective. For a just culture to work, it must be applied comprehensively and consistently. Otherwise, by definition and in reality, it is neither just nor is it truly in effect.

For an excellent description of why and how to implement a just culture, refer to Flight Safety Foundation's legacy magazine, Flight Safety Digest, March 2005, for the article, "A Roadmap to a Just Culture: Enhancing the Safety Environment." This was compiled by the Global Aviation Information Network (GAIN) Working Group E. One of the points the paper makes is, "When hazards are reported, they are analyzed using a hazardbased methodology, and appropriate action is taken." That phrase encompasses a performance assessment-based answer to effectively addressing the threat of crewmember cognitive decline.

Another logical approach to cognitive assessment of pilots would be to have training companies incorporate it into their recurrent training curriculum. In fact, the president of a major charter management company made that request over a decade ago. He asked the CEO of a major training company if his staff could design and conduct a cognitive competence diagnostic of the charter management company's flight crews.

The response was, "Yes, but we won't do it." There were two reasons: marketing and legal concerns. The

charter management company president then approached the CEO of another large training company and received the same answer.

Considering the lack of an established model, I offer the following as a recipe for addressing concerns about flight crew cognitive performance. Like all recipes, skipping steps and using inferior substitutes will cause the end product to vary, usually negatively.

Flight departments will need to collaborate with human resources and legal departments to assure the policies and practices are equitable and defensible. If operators do not have the internal expertise to develop such policies and practices, they should use outside experts.

Here is a proposed outline of steps toward cognitive competence assurance, assuming the use of professional advice from AMEs and other health care specialists qualified in this field:

- Establish and maintain a comprehensive just culture. This lays the foundation for self-reporting, as well as observer reporting of significant and sustained variations from normally expected cognitive performance.
- Establish policies that apply to all flight crewmembers for:
  - Company approved AME selection and use; and,
  - Obtain loss of license and disability insurance coverage that is adequate to assure equitability in the case of identified deficiencies.
- Consistently use only valid cognitive assessment tools and tests:
  - Online, written and practical tests are widely available;
  - Conduct routine cognitive assessments to establish baselines and to identify variations;
  - Develop and consistently administer a periodic flight simulator session that incorporates proven elements of cognitive assessment that are easily observed and scored; and,
  - Use internal observers or consultants to conduct the flight simulator observations.

  The simulator training companies typically will not do this for the operator.
- When a significant variation is observed, conduct additional and more in-depth diagnostics to determine if the variation is:
  - Transient due to fatigue, a temporary or treatable medical condition, medications, etc. Address the source of the transient variation and have an AME reconfirm fitness for return to duty; or,
  - Permanent and progressive.
- When confirmed cognitive decline is severe enough to affect flight safety and is not correctible, deal with the results humanely and equitably:
  - Use the loss of license insurance benefits in place;
  - Use supplemental disability insurance benefits to compensate for gaps in income replacement;
  - Provide career-related and personal counseling; and,
  - Consider offering the person a nonflying position in the flight department.
- If separation is necessary, consider celebrating the person's legacy of contributions and accomplishments. It may help provide the most positive transition possible for the person and the department.

"The risks to flight operations from cognitive decline in aging flight crewmembers are significant," says Snyder. In the U.S., there are currently no adequate regulatory or industry safeguards that can assure business aviation operators that their pilots are cognitively competent. That puts the ball squarely in the operator's court.

Peter v. Agur Jr. is chairman and founder of The VanAllen Group, a business aviation consultancy team with expertise in safety, aircraft acquisitions, and leader selection and development. A member of the Flight Safety Foundation Business Advisory Committee and the National Business Aviation Association (NBAA) Corporate Aviation Managers Committee (emeritus), he has an MBA and an airline transport pilot certificate, and is an NBAA certified aviation manager.

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