FATIGUE MANAGEMENT:
PROCEDURE VS PRACTICE

Fatigue management is an issue that is growing in importance with the demands and pressures of 24-hour operations and with ever-greater cost-efficiency. In this article, **Nick Carpenter and Ann Bicknell** discuss purposeful and tactical non-compliance with procedures for fatigue management. What lies in the gap between procedure and practice?

KEY POINTS

1. Procedures have an important place in safety-critical enterprises.

2. Humans are adaptable problem solvers trying to do their best.

3. For fatigue management, blind compliance with procedures to result in safe operations may not always ensure safe operations.

A growing challenge

On 12 February 2009, a Colgan Air Dash-8-400 crashed whilst on approach to Buffalo-Niagara Airport New York in the United States of America. Forty-five passengers, the four crew and one person on the ground died in the accident. Inappropriate inputs by both crewmembers contributed to exacerbate the stalled condition of flight 3407. The National Transportation Safety Board cited pilot fatigue as a contributing factor. The United States Federal Aviation Administration (FAA) listed 'Reducing Fatigue-Related Accidents' on its 2016 most wanted list.

The fatigue problem is linked to the economics of aviation. In the United States, deregulation of the airline industry occurred in 1978, with open skies between the EU and US arriving in 2008, eliminating service restrictions between the two trading blocks. The result is that airlines operate in an increasingly competitive environment, fuelled by the rise of Low Fare Airlines. The fall-out has included seven bankrupt airlines in Ireland, 39 in the UK and over 100 in the United States since 2000; a rate of just under one per month.

The pressure means that crews are working longer. In the first large-scale survey by the London School of Economics of pilots' perceptions of safety within the European aviation industry, 51 per cent of pilots surveyed felt that fatigue was not taken seriously by their airline, and 28 per cent of pilots felt that they had insufficient numbers of staff to carry out their work safely. The issue is reflected in the British Airline Pilots' Association campaign to raise awareness of fatigue within the industry. Concurrently, regulatory authorities are relaxing prescriptive flight time and duty limitations designed to keep pilots alert, exemplified by the FAA's new rules that exempt freighter pilots.

To try to understand this problem further, I recruited 11 medium-haul pilots to participate in semi-structured interviews and the transcribed data was thematically analysed. The pilots, all employed by a foreign carrier, conduct 'tours of duty' where they spend approximately 20 days working day and night flights (irregularly allocated), followed by a return to their country of domicile and 10 days off. As an experienced airline pilot, I was afforded candid disclosure of the current 'coping strategies' of this hard-to-reach professional sample.

I wanted to investigate how pilots attempt to cope with fatigue. It was anticipated that they would employ strategic and tactical methods.

Strategic planning typically involves lifestyle adjustments prior to duties starting. Tactical coping involves behaviours used to maintain alertness whilst on trips.

In general, pilots:

- found sleep less restorative in company-provided hotels
- struggled with changes from day to night duties
- found multiple sector duties more demanding, and
- felt that diverting was the most fatiguing operation.

Many participants instinctively used tactical techniques identified by sleep laboratories; coffee, cockpit lighting and conversation being the most popular tactical methods to maintain alertness. Some used cognitive methods including games, reading and music and a minority used physical methods such as exercise, both in the aeroplane and between flights.

**Don't worry Jim, have a look at the roster!
Soon you'll become an experienced pilot, like the rest us!**

Enabling non-compliance: When procedures and practice diverge

Bearing in mind aviation's heavy reliance on, and belief in, procedures, the most interesting outcome was the discovery that many of those interviewed have operated contrary to company procedures in a limited number of areas. Hollnagel et al (2014) suggested that what workers actually do at work can sometimes be very different from what managers, and those who write procedures, believe that they do. This difference between 'work-as-imagined' and 'work-as-done' only becomes apparent after something has gone wrong.

Typically, the procedure that fails has been used for a significant amount of time before being implicated in an incident. In the current context, crews are expected to remain alert in the cockpit without the use of controlled rest and are not allowed to use medication to help them to sleep between duties. Of those interviewed, almost all coordinated with their flight deck colleague to enable them to sleep in the cockpit whilst on duty. Some of them resorted to medication to enable recuperative rest between duties in contravention of current procedures. It is only through

non-compliance with procedures that interviewees felt they were able to maintain their alertness at critical stages of flight: approach and landing.

What's prescribed is not necessarily what happens

For these pilots, blind compliance with procedures is not always the ideal method of delivering safe flight. This is something that we need to explore, whilst considering how to integrate 'enabling non-compliance' into safe operations as one method of optimising performance. That said, judging when it is prudent to contravene established procedures is difficult. Indeed, many would argue that this is a radical concept, but procedures have to evolve with the context in which they are used.

'Enabling non-compliance' has a dual purpose: facilitating open disclosure about frontline procedures while enabling procedure writers to adjust their work-as-imagined to the changing needs of frontline employees. This research suggested that those interviewed believe that they are capable of judging when non-compliance is prudent. The focus, then, needs to be on building flexibility into Standard Operating Procedures to close the gap behind work-as-imagined and work-as-done, whilst training crews to give them greater cognitive skills and judgmental awareness to step outside the rules when they have reached the limit of their effectiveness. Research by Robert Mauro (2016) and

by Frederik Mohrmann et al (2015) suggests that resilience training should include training in decision-making and information analysis, including the use of virtual experience, strategies for decision shifts and the appropriate allocation of time to endow both competence and confidence in a non-jeopardy environment where flexibility and decision shifts are accepted.

Implicit in this change to training is the need for cultural change within organisations where simulators are used for competency training instead of only checks, and where an acceptance that stepping outside of procedures can, on occasion, be acceptable.

Of course, questions remain about risk and safety monitoring, procedure design and just culture. If work-as-done is sometimes deliberately contrary to procedures: 1. How can the company understand what is going on, and ensure that risk is adequately assessed in light with regulations and its safety management system? 2. How can procedures be adapted to be more flexible to allow for discretion around practices that aviation professionals deem to be safe and effective? 3. How will companies and national judiciaries treat pilots who purposefully contravene procedures, even when it makes sense to them to do so, if an accident occurs? These are questions that the industry will need to consider as work becomes more complex and demanding than we can imagine. ⑤

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Nick Carpenter is a military trained and commercially experienced airline pilot flying wide body aeroplanes in Asia. His interest in flight safety has inspired him to study for both a Bachelor's and a Master's degree in Psychology and he is currently in the process of establishing a peer support network for contract pilots in Japan. The research cited formed the Dissertation for Nick's MSc.

Reference

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Further reading

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