MULTITASKING IS A BAD IDEA!

By Michael R. Grüninger and Markus Kohler

POOR DECISION MAKING accounts as a casual factor for 30 to 40 percent of all aircraft accidents, in both commercial and general aviation. This data is quite surprising, given that pilots are not only highly trained, but also work in teams. Within a team, flaws in decision making should be recognized and a fatal course of action prevented by the monitoring crew member. However, several factors contribute to the degradation of decision making processes. Such factors are also referred to as stressors.

COMMON The common reason for many accidents is a lack of discipline and personal responsibility.

Stressors diminishing the ability to make appropriate decisions are classified in two main groups: external and internal. External stressors comprise environmental and psychosocial factors and include poor flight conditions, extreme heat or cold, high noise level, excessive vibration, altitude effects, crowded place, air pollution, humidity extremes and distractions. Psychosocial factors include workplace or family conflicts, low job satisfaction, feeling a lack of support, unrealistic expectations, financial problems and loneliness.

Internal stressors are divided into physiological and cognitive factors. Poor diet (nutrition), tobacco smoking, muscular fatigue, sleep deprivation, alcohol, high blood pressure, caffeine, decreased vision, hunger and thirst are examples of physiological factors affecting decision making, while lack of information, informational overload, mental fatigue, fear, boredom and high workload are examples of cognitive stressors.

The Regulator has recognized the degrading effects of the most obvious stressors – in particular, some physiological and cognitive stressors such as the consumption of alcohol or drugs and fatigue. Some degrading effects on cognitive functions that endanger flight safety are thus addressed by the Regulator.

Less obvious stressors are not regulated. However, fatigue risk management will attempt to eliminate or at least mitigate the effects of such physiological stressors as sleep deprivation. The effects of fatigue typically increase in reaction time, a tendency to overlook or misplace sequential task elements, be distracted by minor tasks and neglecting critical tasks, impaired (short term) memory and impaired communication. In the wake of the discussions on safety culture, especially psychosocial stressors like lack of support of employees by their employer and unrealistic expectations within a company are also addressed. *Having said this, let's look at some accidents and serious incidents.*

Human Behavior Leading to Accidents/Incidents

Recently, several accidents and incidents have highlighted some behavioral patterns by pilots in the cockpit. The common denominator, we believe, is a lack of professional discipline and sense of personal responsibility. In fact, maybe these accidents and incidents are really an indicator of an unstable work environment in

which pilots are not supported by a professional company culture?

Aviation Accident Investigation reports suggest that pilot's chit-chat and joke during critical phases of flight, thus creating distractions that may have played a role in causing several accidents and serious incidents. The most recent example of this involves the two pilots on a Northwest Airlines Airbus A320 who overshot their Top of Descent Point by a hundred and fifty miles. It seems both pilots were busy studying new planning software the company had uploaded on their laptops.

Why did the Northwest flight crew decide to use the time on cruise to form a "study group" in the cockpit? The most aired explanation was that these pilots violated a company rule, namely not to use a laptop in flight. Looks like we're back to playing the blame game! Let's try to see whether some of the stressors mentioned above might have contributed to the obviously bad decision made by the crew on that day.

The three stressors most likely to have played a role include:

❍ Boredom: While cruising with locked flight deck doors both pilots had to monitor automation and the progress of flight. The general atmosphere in the flight deck might have been relaxed and confident, with little stimuli from the outside. The pilots, as often observed, might very well have been bored during this uneventful phase of the flight.

❍ Lack of support: Let's imagine you get a new software program and you're being given a minimal training/description only. This is an assumption, but often software is being presented as "self-explanatory", and then, as a normal end-user, you find it to be less than self-explanatory. This creates a need for getting more explanations and to find support where you can.

❍ Unrealistic expectations: Expecting employees to understand change easily and to adapt to it without major effort is unrealistic, both by a company as well as by the employee.

By just taking these three stressors into consideration, it seems "logical" to imagine this flight crew decided to make best use of what they perceived as being basically idle time – they decided to form a study group. Maybe fatigue played into this, degrading the overall outcome of the decision making process. They violated basic rules, and yet, while doing so, they may have had the best intentions. While the authors do not know, it is easy to assume that they tried to act as highly efficient employees making best use of time for the benefit of their company.

In any case, their decision making is an example of having decided that multitasking is a viable option. While multitasking in cruise did not end in a catastrophe, multitasking in critical flight phases did end badly.

Multitasking

In all cases, crews "decide" to multitask due to exposure to one or multiple stressors.

Bottom line, this crew decided to perform several tasks at the same time – studying the new software and monitoring the flight/ATC. They probably believed the myth that multitasking comes easily to humans. However, scientific research has shown that multitasking situations create vulnerability to error, even in the most routine aspects of operations.

Multitasking is either the consequence of a complex and dynamic working environment or a way to proceed decided by the crew. Regardless, multitasking situations may not only be generated by a particular flight crew feeling compelled to maximize their time utilisation. Organizational and social demands, increased air traffic, commercial and public pressures, and even pilots' overestimation of their own abilities create routine situations that in fact conceal appreciable risks.

The real world is much more complex and dynamic than its representation in manuals and in training. Standard operating procedures represent an ideal world in which a procedure is designed step-by-step. In real life, pilots must "interweave steps of one task with steps of other tasks, or defer one task until the other task is completed, or even purposefully omit one task." (The Perils of Multitasking by L.D. Loukopoulos, R.K. Dismukes and I. Barshi, in ASW August 2009 p.21)

Northwest's flight crew erred in deciding they would be able to multitask in cruise. They overestimated their ability and believed their violation would have no consequences. Well, they were proved wrong as they exceeded the limitations of human cognitive performance.

The Regulator has addressed the issue of multitasking on a very high level. In the United States FAR 121.542/135.100, "Flight Crewmember Duties" introduces the sterile cockpit concept (5). Strictly speaking, this rule is legally applicable only to Part 121 (Scheduled Air Carriers) and Part 135 (Commercial Operators). However, a pilot of an aircraft flying under Part 91 (non-commercial general aviation) rules could presumably be charged with careless and reckless operation, per FAR 91.13, if an accident occurs as a result of distraction due to idle chatter or other non-essential activity during a critical flight segment.

In Europe, such a concept is not regulated, but inferred in EU-OPS 1.313 under the title "Use of Headset":

(a) Each flight crew member required to be on flight deck duty shall wear the headset with boom microphone or equivalent required by OPS 1.650(p) and/or 1.652(s) and use it as the primary device to listen to the voice communications with air traffic services:

— on the ground:
— when receiving the ATC departure clearance via voice communication,
— when engines are running,
— in flight below transition altitude or 10 000 feet, whichever is higher, and
— whenever deemed necessary by the commander.

Accidents and incidents show – Do not decide for multitasking on purpose or by lack of discipline.

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