Is controller fatigue as big a problem as pilot fatigue?

By Gérard van Es

It is well known that pilot fatigue can present a risk to flight safety. Different numbers have been published on the share of the pilot fatigue in aircraft accidents. For instance, it is often claimed that pilot fatigue contributes to 15-20% of fatal aviation accidents caused by human error. Other sources have indicated lower numbers in the order of 1-2%.

It is not easy to determine whether pilot fatigue played a role, especially if the pilots didn't survive the accident. What about controller fatigue? Although controllers are not faced with jetlag, noisy hotels, long flights, etc., fatigue can play a role in their performance. Sleep during the daytime is usually not as effective as during the night, which can affect the controller who has to work during the night or very early in the morning. Also a lack of sleep can affect the controller's performance. A query in the NLR-ATSI air safety database failed to provide an enormous list of accidents in which controller fatigue played a role. One should keep in mind that this result could be biased by the fact that controller fatigue is not always recognised by the investigators or even considered as a possible factor. Let us consider two interesting examples in which controller fatigue was a factor.

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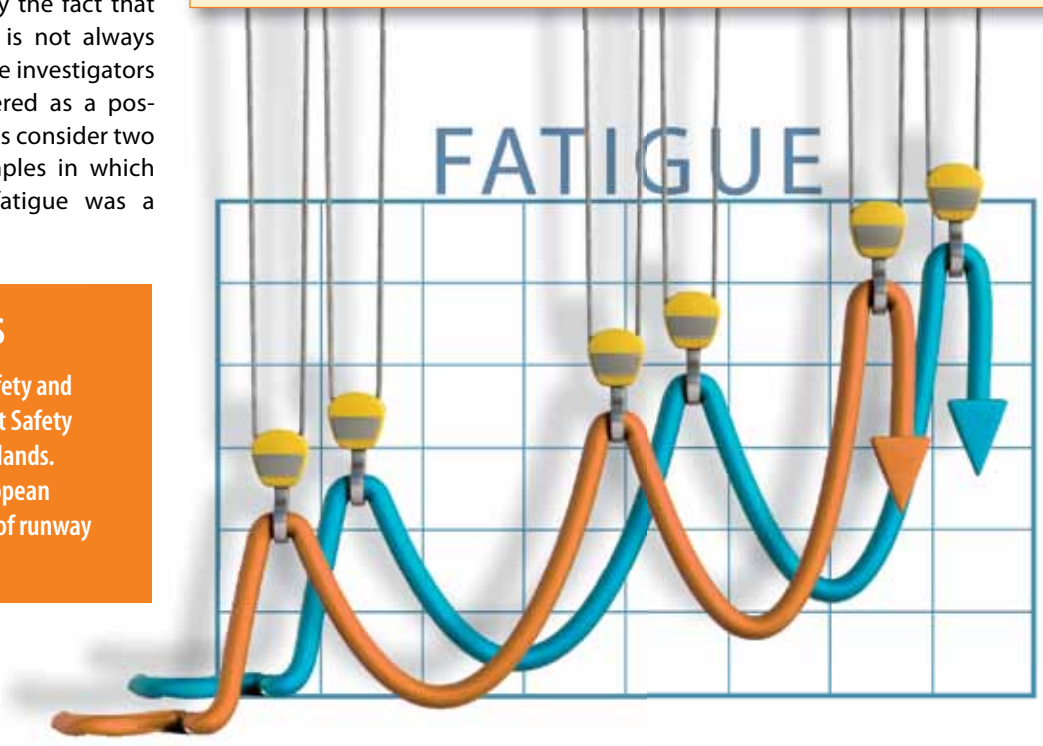
CASE 1 (reference: NTSB report LAX04IA302)

On August 19, 2004, a Boeing 747-400 overflew a Boeing 737-700 while the B737 was on the active runway 24L, at Los Angeles International Airport. The Boeing 747 came within 200 feet of the B737 while it was executing a go-around on runway 24L. The B737 had been cleared for takeoff on runway 24L. At the time of the incident, a controller change on the LC2 position had just occurred and the relief controller was responsible for handling both aircraft. The Safety Board concluded that a loss of separation between the B737 and the B747 was caused by the LC2 relief controller's failure to appropriately monitor the operation and recognise a developing traffic conflict. The investigation determined that the relief controller had had only 8 hours off duty between the end of his August 18 evening shift at 2330 and the beginning of his morning shift at 0730 on the day of the accident. As a result, the relief controller reported sleeping just "5 or 6 hours" the night before the occurrence. The controller described his shift leading up to the occurrence as a "hard day." The investigators



CASE 2 (reference: Russian state investigation)

A TU-154 aircraft was destroyed by impact and a post-impact fire when it collided with vehicles on the runway during a landing at Omsk on October 11, 1984. The accident happened in darkness and in poor weather with a 100 m cloudbase and visibility of 3 km in mist and rain. The aircraft was operating a scheduled service from Krasnodar to Novosibirsk via Omsk. Just before the landing the airport ground maintenance crew had requested permission to dry the runway. The tower/ground controller on duty gave the permission and fell asleep right after doing so. He had also forgotten to switch on the "runway occupied" warning. The ground maintenance crew on the runway saw the landing lights switched on. They contacted the tower/ground controller three times but received no response (he was asleep). After that they ignored the lights, thinking they were being tested.

When on final approach, the pilots asked the approach controller for clearance to land but got no response. However, after a second request the flight was cleared to land. The approach controller had verified the runway status as unoccupied and had also tried to contact the tower/ground controller but received no response as this person was asleep. He then contacted the ground controller on an internal radio and received an inaudible reply which the approach controller interpreted as "free", meaning the runway is free. The approach controller then cleared the flight for landing. After passing the inner marker, the captain thought he could see something on the runway and asked 'what's there on the runway?'. The navigator also thought he saw something and replied 'something's blinking'. However, the approach was continued and the aircraft touched down normally. Immediately after touchdown the crew noticed that there was indeed something on the runway and shortly after that realised that the runway was obstructed by a number of vehicles. Two sweeper vehicles and an escort car were on the runway. The pilot immediately attempted to take avoiding action by steering the aircraft towards the right but without success and the aircraft collided with the vehicles. The impact and post-impact fire caused many fatalities amongst the passengers, crew and people working in the ground vehicles.

The investigation found that one of the causes of the accident was a lack of co-ordination between the tower/ground controller and the approach controller. The tower/ground controller had fallen asleep and therefore failed to tell the approach controller that the runway was obstructed. He had allowed the service trucks to move onto the runway without permission from a supervisor. He had also forgotten to switch on the "runway occupied" warning. After the accident he could not remember any of his actions during that time. He was supposedly suffering from lack of sleep because of his young children. This might explain the fact that he fell asleep and was also violating procedures at the time of the accident.

concluded that the acute sleep loss resulted in a slight decrease in cognitive performance of tasks involving working memory and reaction time. Research on sleep and human performance points to an optimal sleep length of between 8 and 9 hours per night. Studies conducted under controlled laboratory conditions have found that restricting sleep to 4-6 hours for one night causes moderate increases in subjective sleepiness and slight decreases in cognitive performance of tasks involving working memory and reaction time.

CONTROLLERS

PILOTS

Although controller fatigue does not appear to have contributed to as many accidents as pilot fatigue, these examples show that controller fatigue can result in serious events.