



# Fighting Fatigue: A Team Effort

BY DEBORAH A.P. HERSMAN

Seven-time Tour de France bicycle race champion Lance Armstrong possesses many physical attributes that make him an ideal biker, and he carefully trains to be the winner that he is. But Armstrong did not win any of those races by himself. Every time he crossed the finish line ahead of his competition, he did so with the help of a great team who carefully planned his success. Armstrong's team included doctors who developed meal plans and monitored his food consumption, physical trainers who developed a strict regimen of exercise, engineers who designed equipment and apparel that minimized wind drag, and other cyclists who surrounded Armstrong during the race to block wind and help him preserve his energy for the final sprint.

Top athletes will tell you that preparing themselves for competition is the key to success. This is a basic, uncomplicated concept, yet remarkably it often is ignored by other professions,

including the aviation industry. I am not suggesting that flight crews should be doing Lance Armstrong-like training in their local gym before every flight. I am suggesting that our industry needs to provide a structure that enables and encourages flight crews to look after their physical well-being, especially before they board an aircraft full of passengers totally dependent on their performance in the cockpit. The most obvious component of good physical well-being is adequate rest. In my role on the National Transportation Safety Board (NTSB), I have seen firsthand the unfortunate results of operator fatigue in all modes of transportation.

How does fatigue affect a pilot? It reduces a pilot's ability to maintain situational awareness and clouds a pilot's ability to reliably detect, appreciate and respond to events in a timely manner. A fatigued pilot is more likely to take unacceptable risks. In the February 2007 runway overrun by Shuttle

America Flight 6448 at Cleveland (CLE), the captain allowed the precision approach to continue to instrument landing system minimums even though he and the first officer were confused when the approach controller told them that the glideslope was unusable (ASW, 9/08, p. 22). While in deteriorating weather conditions, the captain did not take command of the landing, but instead gave this responsibility to the first officer whose piloting abilities he questioned. When the captain lost visibility after descending through the decision height, he did not reinforce his go-around callout or respond to the first officer's failure to execute the missed approach as instructed.

The captain had a severe sleep disorder and a demanding duty schedule. The accident occurred almost 10 hours into the captain's duty day, by which time he had been awake for about 31 of the 32 preceding hours. Although the captain acknowledged

that he was tired, he might not have fully recognized the extent to which his fatigue impaired his performance during the flight.

Some experts believe that modern cockpits and other technology-rich transportation environments create periods when fatigue-based performance errors can occur without harmful results, leaving the false impression that there is no real cost to operating when fatigued. Consider the November 2004 accident involving the Gulfstream III that crashed while on final approach to Houston's Hobby Airport (HOU), where it was scheduled to pick up former President George H.W. Bush (ASW, 2/07, p. 28). The first officer made numerous small errors during the approach into HOU, including reporting incorrect automatic terminal information service information "Kilo" instead of "Quebec," reading back an incorrect runway assignment, failing to activate and identify the ILS frequency, failing to properly set the instruments to guide the crew on the glideslope, and failing to adequately scan the cockpit instruments. The NTSB learned in its investigation that the first officer did not have regular sleeping hours, and the captain had not obtained normal sleep during the previous nights. Multiple small errors over a short period of time often indicate fatigue.

Aviation accident data show that human performance-related airline accidents are substantially more likely to happen when pilots work long days, shifts at unusual hours or trips with a large number of takeoffs and landings. The NTSB's 1994 study of flight crew-related major aviation accidents found that captains who had been awake for more than about 12 hours made significantly more errors than those who had been awake fewer than 12 hours.

An airline that structures its flight crew scheduling strictly around the Federal Aviation Administration's (FAA's) hours-of-service regulations is not doing enough to ensure that its crews are not flying fatigued. For example, in the controlled flight into terrain of Corporate Airlines Flight 5966 in Kirksville, Missouri, in October 2004, the captain made a risky decision to continue the landing approach based on inadequate visual cues. He fixed his attention on visual information outside the cockpit to the exclusion of critical information on the airplane's instruments showing the descent rate and altitude. The accident flight crew had been on duty for 14.5 hours, and they had received early wake-up calls, around 4:30 a.m.

NTSB's interest in fatigue goes back more than a quarter century. In fact, this issue is on our "Most Wanted List of Safety Improvements," where we highlight the most critical transportation improvements needed. The NTSB continues to encourage the U.S. Department of Transportation to upgrade hours-of-service regulations in all transportation modes to assure that they incorporate the results of the latest research on fatigue and sleep issues. The NTSB also has recommended that the FAA end the practice of allowing flight crews to operate non-revenue training or repositioning flights after they reach their flight and duty time limits. Further, the NTSB is becoming more aware and concerned about the effects of sleep disorders in flight crews. Sleep disorders are treatable, but pilots need to be aware of the symptoms and the serious risks they pose if left untreated.

On its face, the fight against fatigue seems like a personal issue that must be addressed on an individual level,

one pilot and one flight at a time. In fact, however, the fight against fatigue is a shared responsibility that must be addressed as a team effort, much like Lance Armstrong's team. The NTSB will continue to push for better fatigue awareness in the hope that the FAA will issue more science-based hours-of-service regulations, and that airlines will improve education, training and policies related to fatigue and structure crew schedules to minimize fatigue.

Pilots have to learn to recognize the signs of fatigue in themselves and in their fellow pilots, and take steps to prevent it. It will take all of these efforts to effectively and systematically address flight crew fatigue, but the team approach is not as complicated as it may sound. It could be as simple as thinking about each flight as a challenge to be won by a team supporting a professional in the best condition to provide optimum performance. It could be as simple as thinking about Lance Armstrong. ➔



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