The Nature and Effects of Fatigue

By Dr. Donald Hudson, ALPA Aeromedical Advisor

Commerical aviation has long been a 24/7 enterprise but as we move into the 21st century—and deal with an expected 50 percent increase in airline flights in the next decade—we must acknowledge the reality of fatigue and make every effort to mitigate its detrimental effects. As our airspace becomes more crowded, this issue will become more relevant—not less.

As fatigue increased, subjects became more complacent and willing to accept lower standards of accuracy and performance in executing flight maneuvers. They also allowed larger and more frequent deviations before initiating corrective action.

With increasing fatigue, instrument cross-check slowed in speed, and accuracy degraded. The subjects increasingly neglected instruments outside their primary field of vision.

Oral communication between crew-members significantly decreased, and some mandatory “call-outs” were missed as tiredness increased.

These symptoms will be familiar to nearly every pilot reading this magazine. Astute nonpilot readers will also note that these symptoms are similar to those experienced when driving while tired. Indeed, a recent study demonstrated that, after “only” 17 hours of continuous wakefulness, task performance degradation was equivalent to that of subjects with a blood alcohol concentration (BAC) of 0.05 percent. This is above the FAA violation level of 0.04 percent BAC from a DOT-mandated breathalyzer test!

No shortcuts exist for restoring acceptable performance in the workplace. We all need restorative sleep to allow our brains to function at peak performance. This is an area that has no “free lunch”—scheduled reduced minimum rest, consecutive back-side-of-the-clock flight segments, and crossing four or more time zones will result in acute and cumulative sleep loss and resultant increasing fatigue. The flight time/duty time regulations urgently need to be revised to address these issues and to take advantage of increased scientific knowledge about the effects of fatigue on pilots (and all aviation industry workers).

Of course, we humans vary significantly in our response to fatigue, but ultimately, basic human physiology dictates the ability of our brains to adequately function in performing a complex monitoring and response task such as flying.

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