

Finding and Fighting Fatigue

Pilot and controller fatigue has been making aviation headlines in recent years, punctuated by the February 2008 incident in which the crew of a regional jet fell asleep at the controls on the way to Hilo, Hawaii. Although it's usually airliner mishaps that make front page news, general aviation pilots are subject to the same fatigue-related risks and potential for disaster.

Consider this example and ask yourself (honestly) if it seems familiar: After a full workday in a distant office, a pilot flies his/her aircraft home and shoots an instrument approach to minimums

at night. Or, the flight instructor who agrees to take just one more student after a full

day of flying, pushing the limits of Title 14 Code of Federal Regulations section 61.195, which prohibits instructors from teaching more than eight hours in a given 24-hour period.

Fatigue is part of our workaholic American culture, which is known for too much of the wrong food, too little of the right exercise, and insufficient or poor quality sleep. Pilots are not immune to developing such bad habits. In its annual sleep survey for 2009, the National Sleep Foundation found that 20 percent of Americans sleep fewer than six hours and that only 28 percent sleep more than eight hours per night. We report more sleep than we actually get, so the data perhaps underestimates the actual amount of sleep loss experienced by most Americans.

In the spirit of "know your enemy," human factors research is making progress toward making us wiser in the wearying ways of fatigue. The FAA offers a brochure for pilots titled "Fatigue in Aviation," which offers some useful tips on staying healthy and alert, but each pilot needs to be aware of his or her own unique habits and physiological limitations.

Avoid Becoming a Headline

As a pilot, one of the best ways to avoid becoming an NTSB accident statistic is to ask yourself, "If this flight goes badly, what would the NTSB report say about me? How would the headline read the next day? 'Sleep-Deprived Pilot Avoids Fatigue Warning Signs and Crashes, Killing All.'" If it's bad, maybe you should reconsider flying and take a nap.

When there is an accident, an incident, or a close call, trained investigators seek to determine

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Develop Better Sleep Habits

- Get eight hours of sleep each night
- Get into a bedtime schedule and routine
- Turn off the lights and sound
- Make your bed a comfortable sleeping environment
- Cool room is preferred
- Avoid exercise right before sleep
- No caffeine (half-life of caffeine is six hours, so quit early)
- Do not eat two to four hours before sleeping
- Alcohol is not good for sleep

the cause in an effort to prevent such events from happening again. The best investigations identify not just the obvious cause, but rather the numerous factors in the overall chain of events.

The following are a list of simple questions that investigators may ask during an incident or close-call investigation. Pilots can benefit from pondering these questions before they leave the ground, to assess whether they are suffering from fatigue that could lead to an embarrassing incident or a deadly accident.

Example of Investigative Fatigue Questions for Work Task Mishaps (adapted for GA operations)

- How long were you awake prior to the mishap?
- How long was your last “major” sleep period (more than two hours sleep) prior to the work task mishap?
- How much additional sleep did you obtain through nap(s) since your last “major” sleep period?

HOW TO COUNT SLEEP*

Sleep is the **only** cure for fatigue. Many of us overestimate the amount of sleep we get each night. If you have difficulty falling asleep, wake up during the night, or wake up not refreshed, keep a sleep log to count how much sleep you really get each night.

Step 1: Complete the following log over a two-week period. For the period **MON/TUE**, indicate your **bedtime** Monday night and your *wake time* on Tuesday morning. Treat other time periods similarly. Indicate your bedtime and wake time on the bolded day if you obtain your sleep within one day (e.g., Monday for **MON/TUE**).

	MON/TUE	TUE/WED	WED/THU	THU/FRI	FRI/SAT	SAT/SUN	SUN/MON
Week 1 Bedtime							
<i>Wake time</i>							
Total Sleep Time							

	MON/TUE	TUE/WED	WED/THU	THU/FRI	FRI/SAT	SAT/SUN	SUN/MON
Week 2 Bedtime							
<i>Wake time</i>							
Total Sleep Time							

Step 2: Calculate your average sleep time (add your total sleep time in each column and divide by 14).

Step 3: Subtract 30 minutes from your average sleep time (to account for time it takes to actually fall asleep and wake up).

Step 4: If your adjusted average sleep time is fewer than eight hours, reevaluate your plan for sleep.

Average Sleep Adjusted Average Sleep

Step 5: Keep this record and revisit your sleep schedule every three months.

*For additional information on this chart go to www.mxfatigue.com.

Fatigue Mitigation for Air Carrier Pilots

In June 2009, FAA chartered an Aviation Rulemaking Committee to develop recommendations for rulemaking on flight time limitations, duty period limits, and rest requirements for Title 14 Code of Federal Regulations part 121 and part 135 pilots. The committee completed its work in September. As of this magazine's publication deadline, a rulemaking team was evaluating the committee's recommendations and developing a Notice of Proposed Rulemaking (NPRM) on fatigue mitigation for part 121 pilots. While this effort is aimed at air carriers, all areas of aviation will benefit from a spotlight being shone on the fatigue risk factor, which affects all sectors of aviation and all pilots from students through ATPs.

- How much did you sleep in the 24 hours prior to the work task mishap?
- How much did you sleep in the 72 hours prior to the work task mishap?
- How many hours did you work in the five days prior to the work task mishap?

Squeezing in More Sleep

Avoiding fatigue is not rocket science, yet we as humans continue to challenge conventional sleep wisdom by drinking too much caffeine, consuming too much refined sugar, not getting enough exercise, and engaging in other sleep-preventing behaviors, all while working long hours often under


great stress. Our jobs have reduced the requirement for extensive physical work, and child's play is now more likely

Although air carrier pilot fatigue-related mishaps make the headlines, GA pilots are subject to the same fatigue-related risks.

to involve a computer game than a ball field. This vicious cycle drives us to exercise less, eat more, and sleep less—and the cycle continues.

The solution is amazingly simple, yet often difficult to implement: Get more sleep. Humans need about eight hours of sleep in a 24-hour period. It takes about 15 minutes in bed to fall asleep, and your last 15 minutes of sleep is not healthy, restorative sleep. That means that you should spend eight and a half hours in bed, dedicated to sleeping, each night. Don't allow television, radio, or food in bed. If you miss sleep one night then you must sleep extra the following night to catch up. If you want to avoid fatigue, these simple rules are not negotiable.

If you are uncertain of your sleep duration, then you should try keeping a sleep diary. This may be the first advice you would get from a clinical sleep professional. The FAA developed a chart (see previous page) that you can use to track your sleep patterns over a 14-day period. Do you need more sleep? Go to www.mxfatigue.com and find out.

Numerous scientific studies have matched the performance of fatigued drivers to the performance of drunk drivers. The next time you are awake for 20 hours straight remind yourself that your performance level is equivalent to that of a legally drunk driver. Fatigue can affect not only your ability to drive the car, but your decision to drive in the first place. Should you be flying an airplane when you are in that condition? Write the next day's page-one headline in your head, and then lay it down on your pillow to sleep. 

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For More Information

FAA Fact Sheet on Pilot Flight Time, Rest, and Fatigue

http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=6762

Fatigue in Aviation

http://www.faa.gov/pilots/safety/pilotsafetybrochures/media/Fatigue_Aviation.pdf

Fatigue Section of the Maintenance Human Factors Web Site

<http://hfskyway.faa.gov/HFSkyway/FatigueHome.aspx>

Proceedings from FAA Aviation Fatigue Management Symposium, June 17–19, 2008

http://www.faa.gov/news/conferences_events/2008_aviation_fatigue/