Avoiding Airborne Pilot Deviations

Understanding Obstacles to Maintaining Situational Awareness

Many obstacles exist that can interfere with a pilot's ability to maintain situational awareness. For example, fatigue, stress, or work overload can cause the pilot to fixate on a single perceived important item rather than maintaining an overall awareness of the flight situation. A contributing factor in many accidents *and pilot deviations* is distraction, which diverts the pilot's attention from monitoring the instruments or scanning outside the aircraft. Many flight deck distractions begin as a minor problem, such as a gauge that is not reading correctly, but result in *deviations or* accidents as the pilot diverts attention to the perceived problem and neglects to properly control the aircraft.

Fatigue, discussed as an obstacle to learning, is also an obstacle to maintaining situational awareness. It is a threat to aviation safety because it impairs alertness and performance. The term is used to describe a range of experiences from sleepy, or tired, to exhausted. Two major physiological phenomena create fatigue: sleep loss and circadian rhythm disruption.

Fatigue is a normal response to many conditions common to flight operations because characteristics of the flight deck environment, such as low barometric pressure, humidity, noise, and vibration, make pilots susceptible to fatigue. The only effective treatment for fatigue is adequate sleep. As fatigue progresses, it is responsible for increased errors of omission, followed by errors of commission, and microsleeps, or involuntary sleep lapses lasting from a few seconds to a few minutes. For obvious reasons, errors caused by these short absences can have significant hazardous consequences in the aviation environment.

Sleep-deprived pilots may not notice sleepiness or other fatigue symptoms during preflight and departure flight operations. Once underway and established on altitude and heading, sleepiness and other fatigue symptoms tend to manifest themselves. Extreme fatigue can cause uncontrolled and involuntary shutdown of the brain. Regardless of motivation, professionalism, or training, an individual who is extremely sleepy can lapse into sleep at any time, despite the potential consequences of inattention. There are a number of countermeasures for coping with fatigue, as shown at the end.

Complacency presents another obstacle to maintaining situational awareness. Defined as overconfidence from repeated experience on a specific activity, complacency has been implicated as a contributing factor in numerous aviation accidents, incidents and *pilot deviations*. Like fatigue, complacency reduces the pilot's effectiveness in the flight deck. However, complacency is harder to recognize than fatigue, since everything is perceived to be progressing smoothly. Highly reliable automation has been shown to induce overconfidence and complacency. This can result in a pilot following the instructions of the automation even when common sense suggests otherwise. If the pilot assumes the autopilot is doing a fine job, he or she does not crosscheck the instruments or the aircraft's position frequently. If the autopilot fails, the pilot may not be mentally prepared

to fly the aircraft manually. Instructors should be especially alert to complacency in students with significant flight experience. For example, a pilot receiving a flight review in a familiar aircraft may be prone to complacency.

Warning signs of Fatigue

- Eyes going in and out of focus
- Head bobs involuntarily
- Persistent yawning
- Spotty short-term memory
- Wandering or poorly organized thoughts
- Missed or erroneous performance of routine procedures
- Degradation of control accuracy

Countermeasures

- Long naps (3-4 hours*) can restore alertness for 12-15 hours
- Short power naps (10-30 minutes*) restore alertness for 3-4 hours
- Eat high-protein meals
- Drink plenty of fluids, especially water
- Rotate flight tasks and converse with other crew members or passengers
- Keep the flight deck temperature cool
- Move/Stretch in the seat, and periodically get up to walk around if possible

* Allow 15-20 minutes after awakening to become fully alert before assuming aircrew duties.

The above information is from the Aviation Instructor's Handbook, FAA-H-8083-9A. This can be found at the following link:

http://www.faa.gov/library/manuals/aviation/aviation_instructors_handbook/media/FAA-H-8083-9A.pdf