

Objective data analyses to be available next year may offer the best chance yet for U.S. airlines, labor unions and regulators to come to terms with why individual cabin crewmembers sometimes work on flights suffering from what they consider severely degraded alertness. Then, mere opinions about the prevalence of fatigue serious enough to jeopardize flight attendant performance of safety-critical duties may carry less weight.

Airline and regulator interest in cabin safety-related studies by fatigue scientists and other specialists has been reflected in presentations at aviation safety conferences in anticipation of the results of the latest scientific inquiry by

“[Three decades of research] activities have created an extensive scientific foundation to understand fatigue in aviation operations, including policies and practices that can reduce fatigue and enhance sleep, performance and alertness. ... Regardless of the actual participants or measures in specific studies, the findings can be generalized and applied to the human operators in aviation, whether pilots, flight attendants, air traffic controllers or mechanics.”

Status of FAA Research

Current research on flight attendant duty time, rest periods and fatigue by the FAA Civil Aerospace Medical Institute



Fatigued

BY WAYNE ROSENKRANS

the U.S. Federal Aviation Administration (FAA). Cabin crew labor unions and other advocates of increased attention to the issue meanwhile hope that the evolving components of airline safety management systems (SMSs), such as aviation safety action programs (ASAPs) and fatigue risk management systems (FRMSs), will change the perceptions and the realities.

Some U.S. airlines remain unconvinced that any research involving subjective judgments of fatigue by flight attendants should serve as the basis of regulatory changes or airline policy changes. For example, the Air Transport Association of America’s (ATA’s) position is unchanged from when it argued against a national flight attendant duty/rest/fatigue survey, which nonetheless has proceeded as ordered by a congressional appropriations committee in September 2004.¹

ATA says that survey had been inadequately described in the FAA’s request for public comment on funding, and “the information obtained will not have practical utility, and the survey will not add to the FAA’s efforts to define, enact and support policies and practices that effectively manage fatigue in aviation operations.” Self-reported, subjective data cannot address questions of minimum crew rest regulations, reduced rest and potential regulatory revisions, the association said.

“The design and outcomes of any effort should include a clear path from study findings to an evaluation of whether further regulatory action is needed or warranted,” ATA said.

(CAMI) comprises six follow-up projects that closely track recommendations that CAMI issued in July 2007.² Based on limited information gathered in the time available, that report had listed sleep loss among the main factors in flight attendant fatigue.

This factor has been “shown in numerous studies to produce waking neurobehavioral deficits, which include vigilance degradations, increased lapses of attention, cognitive slowing, short-term memory failures, slowed physical and mental reaction time, rapid and involuntary sleep onsets, decreased cognitive performance, increased subjective sleepiness, and polysomnographic evidence [recordings during sleep of brain activity, eye movement and muscle tone] of increased sleep pressure,” the report said. “Cumulative sleep loss results in sleep debt, with chronic sleep deprivation, night after night, leading to cumulative and progressive performance decrements, even in healthy adults.”

Another main factor for flight attendants is circadian rhythm disruption, and a third is length of duty time. “Sleep loss and circadian rhythms interact dynamically to regulate changes in alertness and performance,” the report said. “The effects of jet lag and shift work are often characterized by symptoms such as disrupted sleep, changes in mood state, loss of appetite, gastrointestinal disturbance and disorientation. ... Fatigue during international flights

is due mainly to flight duration and time zone differences, while fatigue on domestic flights is related to total working hours, landing frequency (number of legs), workload and layover duration.”

Research teams are scheduled to publish results from the current projects at the end of December, according to Thomas Nesthus, a research psychologist of the CAMI Human Factors Research Lab. One project is the national duty, rest and fatigue survey. The survey covers topics such as rate of occurrence of fatigue, working conditions in which fatigue occurred, consequences of fatigue, duty time and rest period schedules, and personal experience with airline practices.

and awake while on duty and off duty, among other objective data. The researchers planned to collect data to “explore the physiological and neuropsychological effects of fatigue, sleepiness, circadian factors, rest schedules, etc., on flight attendants ... collect actigraphic data and light measurements to document flight attendants’ sleep/wake schedules and exposure to zeitgeber cues [natural environmental signals that synchronize the human body’s time-keeping system] from light,” the 2007 report said. The participants also are completing sleep diaries to verify sleep/wake schedules.

Also under way is a content analysis of more than 2,000 de-identified event reports for “fuller understanding of

New FAA research probes flight attendants’ anxiety over insufficient sleep and unsafe performance.

IN THE BACK

Of survey questionnaires distributed to a random sample of 20,835 flight attendants, a total of 10,549 (51 percent) were completed and returned by the March 31 deadline for subsequent de-identified analysis. By mid-year, all data had been scanned and entered into a database, and were being analyzed, Nesthus said.

A parallel project is a field study, for which nearly 6,000 flight attendants volunteered, with an integrated assessment of computer fatigue models. Following approval of the data collection protocol for research on human participants, a research team under contract to CAMI during May randomly selected and trained a sample of 210 individuals from those who volunteered, stratified by type of operation and seniority, he said.

“Over a dozen of these flight attendants [so far] have received and have been trained on the use of the personal digital assistant–cell phone devices that we are using in our field study to collect data over a 25- to 30-day period,” Nesthus said. “This is a rather unique data-collection effort in regard to the limited attention that flight attendants have received in the research literature.”

Data collection began in June, focusing on fatigue during line operations. Participants wear actigraphy sensors on their wrists to detect body motions, pedometers and other devices that fatigue scientists have developed to measure the times and durations of every period that flight attendants are asleep



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“Regulations must be combined with sound and realistic operational practices, and supplemented, as needed, by personal strategies.”

fatigue-related incidents” involving flight attendants. This project included a related survey of all members of airline ASAP event review committees; the survey response was approximately 46 percent.

For the other projects, researchers have collected and content-analyzed 50 international regulations and agreements pertaining to policies or practices that affect flight attendant fatigue “to see how other countries address these issues” and “to provide additional data to supplement other ongoing research”; collected, reviewed and summarized global scientific findings on fatigue training and countermeasures in multiple transportation modes, such as rail, highway and aviation; and drafted a report on prospective benefits of training flight attendants on fatigue issues and implementing fatigue countermeasures. Such training would be expected to comprise “exposure to information on fatigue, its causes and consequences, its interaction with circadian disruption, and how and when to employ countermeasures (scheduled naps, physical activity, social interaction, caffeine, etc.)” CAMI said in the 2007 report.

AFA-CWA Advocacy

The Association of Flight Attendants–Communication Workers of America (AFA-CWA), along with other unions, has advocated government research on flight attendant fatigue,

Kolander

drawing from findings of an internal survey of members in 2005, said Candace Kolander, coordinator of air safety, health and security, and a presenter during the February 2009 International Aircraft Cabin Safety Symposium (CSS).

“Flight attendants typically still have to jump through hoops to say ‘I’m fatigued’

to their air carriers without disciplinary consequences,” she said. “If carriers want to have a complete FRMS, they can’t just look at fatigue in the front of the airplane, they need to look at fatigue in the back. We have made inroads. The response of volunteers to current CAMI research says that U.S. flight attendants are saying ‘We do believe this is a problem,’ and they want to ensure that the problem gets solved.”

Echoing ATA’s 2008 comments, AFA-CWA expects any changes to U.S. regulations to require a scientific basis, she said. Kolander said that prescriptive rules setting minimums — even for air carriers that demonstrate an equivalent level of safety from their FRMS — probably must continue, however, but with the misleading term “rest period” dropped in favor of “time off duty” or a similar term. This change would be recommended because “rest period” connotes time provided for sleep, but includes many routine activities such as riding on airport shuttle buses, checking into hotels, eating meals, bathing and dressing that reduce the sleep opportunity.

The airline practice of providing minimum regulatory rest periods between scheduled duty days has been perceived by AFA-CWA members as the main reason fatigue is an unresolved issue. Unless airline-labor agreements say otherwise, some flight attendants can be assigned to operate on patterns that can result in severe sleep debt, Kolander said.

The 2007 CAMI report said researchers at the time could not determine how widespread or problematic the practice is of scheduling flight attendants to operate according to the regulatory maximum for scheduled duty times — with the regulatory minimum rest periods and minimum subsequent rest — all based on science dating from the early 1990s. “To truly address the fatigue issue, regulations must be combined with sound and realistic operational practices, and supplemented, as needed, by personal strategies,” the report said. Age, gender, general health, level of cabin crew experience and “the highly variable personal/domestic situation including commuting requirements” were the individual risk factors cited.



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“We try to work with the carriers to do fatigue assessments of our members,” Kolander said. “We also say to them, ‘Let flight attendants call in fatigued without discipline, but also recognize and mitigate the problem by providing fatigue training in recurrent training classrooms.’ Hopefully, the air carriers and the flight attendant community can come together and say, ‘Here are some of the circumstances where flight attendants can report fatigued without threat of disciplinary action.’”

How flight attendants typically commute and use their off-duty time to obtain the optimal seven to nine hours of sleep also enter the picture. “I believe that U.S. flight attendants are becoming more aware that what they do off duty can have a bad effect on cabin safety — that awareness is a good thing,” Kolander said.

Reports AFA-CWA received from fatigued flight attendants have said they had forgotten to arm their evacuation slides, Kolander told the symposium. “Others had forgotten that they had unaccompanied minors aboard the aircraft, and let them leave the aircraft on their own,” she added. “We also hear from flight attendants about being pulled over by police because many of the effects of fatigue actually do mimic drunk driving. Yet just prior to being stopped, at the end of a long duty day, they had been on board an aircraft ‘ready’ to operate the emergency equipment. If their behavior was a hazard on the road, why was operating in a fatigued manner not a hazard on board the aircraft?”

“Such anecdotes argue for the need to address flight attendant fatigue, and there has to be a nonpunitive approach. Meanwhile, we are trying to educate our own members that fatigue is important and that they do have to take responsibility to educate themselves, which means getting the proper rest.”

Stop-Gap Energy Drinks

Acutely fatigued flight attendants sometimes have failed to communicate abnormal situations to the flight crew, said Lori Brown, an aviation science faculty specialist at the Western

Michigan University and the second presenter to focus on the issue at the 2009 CSS. In one example from her files, she described the fatigued flight attendant aboard a McDonnell Douglas MD-80 who, before departure from Chicago, told the captain via interphone that a “secure ID” had been found during preflight cabin checks.

The captain conducted the takeoff with the understanding that a lost employee identification badge — not a suspicious electronic device with a countdown timer — had been found. Shortly afterward, the flight attendant inadvertently released the tail cone, which fell to the runway from the aircraft during the return for landing at the departure airport.

In recent conversations, some flight attendants have told Brown that the only fatigue countermeasure they routinely use is consuming extra coffee or, occasionally, carrying aboard and consuming cans of caffeinated beverages marketed as energy drinks. “To maintain alertness, the only real cure is to sleep,” she told the symposium. “Caffeine can be effective, but the important thing is strategic use at the proper time in the proper way. That takes education.”

For an enhanced version of this story, go to <www.flightsafety.org/asw/jun09/cabinfatigue.html>.

Notes

1. Berg, David A. ATA comments in response to FAA Request for Comments, National Flight Attendant Duty/Rest/Fatigue Survey. May 19, 2008.
2. Nesthus, Thomas E.; Schroeder, David J.; Connors, Mary M.; Rentmeister-Bryant, Heike K.; DeRoshia, Charles A. “Flight Attendant Fatigue.” FAA Office of Aerospace Medicine. Final report no. DOT/FAA/AM-07/21, July 2007.



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