

Fatigue Awareness

Report urges awareness, education and data-gathering to combat fatigue among aviation maintenance personnel.

BY LINDA WERFELMAN

Aviation maintenance managers and their employees must be made more aware of the risks associated with fatigued workers, specialists in aviation maintenance human factors say, calling for development of a basic awareness campaign as the most important step in fighting workplace fatigue.

They presented their recommendations in a December 2011 report released by the U.S. Federal Aviation Administration (FAA)

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Office of Aerospace Medicine. The proposals — in the form of a prioritized list — were developed during a March 2011 workshop aimed at addressing fatigue in aviation maintenance (“Top 10 Anti-Fatigue Actions”).

“We must make fatigue a public issue if change is going to occur,” the report said. “An organized and integrated movement may be necessary to change laws, improve education and create awareness.”

Workshop delegates — representing the FAA, Transport Canada and the aviation industry — said the fatigue awareness campaign should be led by the FAA and should involve labor unions, professional and industrial organizations, scientists and government.

Increased awareness of the problem is likely to fuel efforts to develop a means of measuring fatigue, the report said, citing efforts in the automobile and trucking industry to use eye-blink technology to gauge driver fatigue.

“High-visibility events drive public and industrial awareness of fatigue,” the report said.

Top 10 Anti-Fatigue Actions

1. Enhance employer and worker fatigue awareness.
2. Continue and expand fatigue countermeasure education.
3. Support and regulate fatigue risk management systems (FRMS).
4. Quantify safety and operational efficiency impact of fatigue.
5. Regulate hours of service limits.
6. Establish baseline data of fatigue risk with existing event reporting systems.
7. Integrate fatigue awareness into safety culture.
8. Ensure that FRMS is considered in safety management system programs.
9. Create and implement fatigue assessment tools.
10. Improve collaboration of FRMS within and across organizations.

Source: U.S. Federal Aviation Administration

“Events that expose fatigued pilots or air traffic controllers receive extensive media coverage. For each of the public events, numerous other occurrences avoid discovery.”

Fatigue is prevalent in industries such as aviation maintenance that operate day and night, the report added, and the related risks “must remain high priority even when the topic is not in the news.”

Along with fatigue awareness, the workshop delegates emphasized the associated need to

“continue and expand fatigue countermeasure education.”

“Training efforts must demonstrate the benefits of proper rest to the employee and to the employer,” the report said, citing several studies. “It must show ‘what’s in it for me.’ It must also teach executives and managers to schedule work, overtime and rest in a safe manner. Education must present the science of sleep and scheduling in an understandable and useful manner. Most importantly, education must motivate learners to modify any poor habits that cause fatigue.”

Fatigue education for maintenance personnel should begin during their initial training, the report said.

In addition, fatigue education should extend to friends and family members, “who must learn about proper rest and schedules to ensure that their loved one is safe at work,” and to the U.S. Congress, which has “applied considerable pressure to alter fatigue-related rules for pilots” but not for maintenance personnel, the report said.

Workshop delegates “felt that such education might encourage the FAA to address the fatigue safety risk with improved regulations,” the report added. “Of course, the industry delegates from both management and labor used the adage, ‘Be careful what you wish for.’”

The FAA Maintenance Fatigue Research Program already has developed and distributed materials for fatigue education, including posters, videos, a fatigue symptom checklist and a fatigue risk assessment tool.¹

FRMS

The workshop delegates also called for action to support and regulate fatigue risk management systems (FRMSs) in aviation maintenance (ASW, 9/11, p. 23).

FRMS has not been widely implemented in aviation maintenance organizations although it has become common in the railroad and commercial trucking industries, and for flight crews.

Where an FRMS is in place, improvements have been noted in personal health and well-being, safety and cost, the report said. For example, one international trucking firm has

reported savings of millions of dollars in health care costs.

FRMSs must be designed specifically for each organization, the report said, adding, “One size does not fit all. Effective fatigue risk management requires that everyone take responsibility for the problem and use multiple strategies to reduce fatigue.”

In an aviation maintenance FRMS, the first goal is to reduce fatigue to an acceptable level by using fatigue-reduction interventions such as “duty time limits, scientific scheduling, napping, education, excused absences and, in some instances, medical testing and treatment.”

The second goal is to reduce fatigue-related errors.

“Despite efforts to ensure that employees are well-rested and alert when they report for duty, it is not possible to eliminate fatigue from the workplace,” the report said. “Interventions can involve two approaches: measures directed toward reducing the risk of the individual and measures directed toward reducing the risk of a task for a fatigued worker.

“For example, reducing the risk of a task by taking work breaks and simplifying work task steps can help. We should not assign fatigued workers to critical tasks. Matching the worker to the task is part of an FRMS.”

The workshop delegates said that, as an alternative to an FRMS, they favored allowing companies to demonstrate how they plan to manage fatigue among maintenance personnel, in part by establishing a maximum service limit and detailing “how they will manage fatigue if they choose to exceed the regulated service limits.”

Better Data

Despite anecdotal evidence of long hours and fatigue-related mistakes,

formal fatigue data are relatively limited, the report said.

“When fatigued mechanics or crewmembers make errors, they are often attributed to procedural errors, memory lapse or mistaken communication,” the report said. “Typically, an event investigation does not have a sufficient root-cause analysis to determine if fatigue was a significant contributing factor.”

As a result, the cost and the impact on safety of fatigue-related errors are unknown.

The report cited sweeping changes in the U.S. trucking industry after improvements in data gathering, including “semi-annual fatigue countermeasure training, health and wellness coaching, evaluation of sleep disorders and proactive fatigue management.” Anticipated regulatory changes include the addition of sleep apnea testing to routine commercial motor vehicle physical exams.

Among the data needed by government and the aviation industry are estimates of the financial effects of fatigue and fatigue-related damage, the extent of risk to flight safety because of maintenance fatigue, the cost of implementing FRMSs and the probability that having an FRMS could have prevented a fatigue-related event.

After the industry has data on the financial and safety risks of fatigue, appropriate interventions can be implemented further and the effects of those interventions can be assessed, the report said.

2010 Survey

The workshop delegates also endorsed a regulatory move to limit hours of service — a move the report characterized as consistent with the high priority assigned to FRMS regulation. The report cited a 2010 survey by the FAA-Industry Maintenance Fatigue Working Group that resulted in unanimous

agreement among those voting that the FAA should propose a duty-time rule for maintenance personnel.

“At the workshop and in the working group, delegates felt that neither industry nor individuals would fully address fatigue without a regulation,” the report said. “Many believed that an FRMS could supplement the hours-of-service limits if equivalent levels of safety were demonstrated.”

The report noted that, worldwide, regulatory duty-time limits vary widely. In China, for example, no more than eight hours of work may be scheduled each day. The current FAA rule allows for 24 hours, and the International Federation of Airworthiness (IFA) recommends a limit of 12 hours, or 16 hours with overtime. Maximum hours that may be worked per month range from 196 to 646 hours, the report said, noting IFA’s recommendation of a maximum of 288.

The report suggested that a U.S. regulation could be developed using IFA recommendations, information gathered through the fatigue working group and FRMS data.

An “hours of service” rule alone is not adequate, the report said, adding that regulations should be implemented that are “flexible to different types of operations and maximize safety.”

This article is based on OAM report DOT/FAA/AM-11-19, “Fatigue Solutions for Maintenance: From Science to Workplace Reality,” written by Katrina E. Avers, William B. Johnson, Joy O. Banks, Darin Nei and Elizabeth Hensley. Johnson is the FAA chief scientific technical adviser for human factors in maintenance; the others are employed by the FAA Civil Aerospace Medical Institute.

Note

1. The information is available on the Maintenance Fatigue Section of the FAA website, <mxfatigue.com>.