

STATUS OF FAA AIR TRAFFIC CONTROL FATIGUE INTERVENTIONS 2013-2016

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The Federal Aviation Administration (FAA) has long been concerned with the impact of fatigue in Air Traffic Operations. Fatigue has been cited as a factor in operational incidents. The shift work and quick turn-around shifts contribute to this problem. In conjunction with the collective bargaining agreement, FAA management and the National Air Traffic Association (NATCA) agreed to jointly develop a series of interventions designed to mitigate some of the aspects of fatigue in the controller workforce. This resulted in a Fatigue Group comprised of FAA management, NATCA representatives, and fatigue scientists. Following 15 work-intensive meetings, the Fatigue Risk Management Group produced 12 fatigue mitigation recommendations. This Fatigue Risk Management Group also supported research conducted by NASA for ATC. The ATC research focused on two components, a fatigue survey of the ATC workforce and a field study with participant volunteers using wrist activity monitors. This research supported the 12 fatigue mitigation recommendations. To date, all recommendations have been fully or partially implemented.

The Federal Aviation Administration (FAA) presented a Fatigue Training Workshop for the 17th International Symposium on Aviation Psychology (Nesthus, Avers, & McCauley, 2013). Fatigue is an important human performance problem. The impact of fatigue, its risks, and mitigations have become key concepts managers and shift workers involved with aviation systems must acknowledge, understand, and manage. The understanding of and support for fatigue mitigation initiatives is critical. The FAA is working to maintain the safety of the National Airspace System (NAS) and ensure the health and well-being of its workforces as well as other workforces within the aviation industry through regulations with consideration of fatigue issues. Fatigue awareness and mitigation are important components of this effort. FAA has developed a full spectrum of fatigue awareness and mitigation programs designed to impact shift workers and managers within aviation systems including air traffic controllers and technical operations specialists, pilots, flight attendants, and maintenance workers.

The workshop presented in 2013 introduced the fatigue science background used in the development of various intervention materials and the modification of those materials to accommodate multiple vocational backgrounds for those involved with aviation systems. Along with the awareness of fatigue issues, maintenance and distribution of this knowledge set, the development and use of personal strategies to optimize sleep and maximize alertness, and the use of ergonomic scheduling principles (to the extent possible), a reduction in fatigue-related risks can be achieved and will contribute to safer operations throughout this industry.

During the 2013 workshop, an overview of the 12 fatigue mitigations mutually agreed upon by FAA and the National Air Traffic Association (NATCA) through the Article 55 Fatigue Risk Management (FRM) Work Group was presented. Article 55 of the NATCA Collective Bargaining Agreement of 2009 directed FAA management and NATCA to jointly develop recommended fatigue mitigation strategies. The NATCA and FAA management representatives appointed to make these recommendations became known as the Article 55 FRM Work Group.

The Work Group Charter established that FAA management and union (NATCA, PASS) representation had important and equal voting status for their recommendations. The Article 55 FRM

Work Group relied on fatigue science and research as an independent resource for the basis of establishing recommended mitigations. This resulted in a balanced approach and provided the inclusion of Civil Aerospace Medical Institute (CAMI) scientists and other research consultants with independent fatigue expertise for the transportation industry. The Office of Aerospace Medicine Medical Specialties Division was also directly involved with medical fatigue issues, obstructive sleep apnea, in particular. The resulting 12 fatigue mitigation recommendations were briefed to the FAA Administrator, the NATCA President, and AT Management shortly after the work group completed them. Also, the National Transportation Safety Board (NTSB) was officially briefed in order to meet the requirement of Safety Recommendation A-07-30 through -32 and A-07-34. Since that time all 12 recommendations have been addressed and implemented in several ways involving many areas of FAA.

Background

The Article 55 (FRM) Work Group promoted fatigue risk management, which relied on a basic Fatigue Risk Management System (FRMS) approach to promote an awareness of fatigue safety and minimize fatigue risks in ATC operations. The basis of the FRMS was first, that fatigue is a physiological state affecting everyone to varying degrees. Second, fatigue is inherent in all shift work environments. Third, fatigue can introduce a risk to the health and well-being of employees and the safe operation of the National Airspace System (NAS). Guidance for an FRMS should include the following elements:

- Must be data-driven and scientifically-based
- Must enable continuous monitoring and management of safety risks associated with fatigue-related hazards
- Must provide a means of measuring, mitigating, and reassessing fatigue risk
- Must include schedule assessment, data collection, and systematic analysis
- Provides scientifically guided fatigue mitigations—both proactive and reactive

The Article 55 FRM Work Group sponsored analyses of current scheduling practices (Orasanu, Parke, & Kraft, 2012) and fatigue modeling using the Sleep, Activity, Fatigue, and Task Activity Effectiveness (SAFTE)/Fatigue Avoidance Scheduling Tool (FAST; IBR, 2016) to identify fatigue-related issues in the ATC work environment. The FRM Work Group also reviewed International research on fatigue. This provided an informed and comparative basis for the developed recommendations.

Addressing fatigue is a shared responsibility. Fatigue countermeasures can help to mitigate fatigue safety risks and improve employee health and well-being. The Article 55 FRM Work Group focused on these themes as well as the components of an FRMS in the development of mitigation strategies reflected in the Work Group recommendations.

Objectives

The FRM Work Group objectives for fatigue mitigation efforts were developed to promote understanding of the basics of fatigue and its mental, physical, and emotional signs; recognition that fatigue can represent a hazard to the safety of FAA operational employees and the NAS; awareness of fatigue countermeasures that can be used to help reduce fatigue risks and increase both personal and NAS safety; and understanding that fatigue may represent a safety risk, depending on the likelihood and severity of the fatigue hazard.

Based on its tasking, the Article 55 FRM Work Group defined a set of guidelines to help focus its efforts. These guidelines provided a backdrop on which Work Group activity was based and included the following:

- Increase the safety of the NAS by reducing fatigue hazards and risks,

- Improve the health and wellbeing of the workforce through better fatigue management,
- Base findings and recommendations on science and data while leaving implementation issues for later discussions, and
- Collaborate with internal and external organizations.

Fatigue Risk Management Group Recommendations and Implementation

Recommendations/Implementation

The Air Traffic Operations (ATO) Safety and Technical Training Fatigue Risk Management Team approved FRMS Work Group Findings and Recommendations by FAA management and NATCA. These recommendations are presented with implementation strategies in Table 1 below:

Table 1.

Article 55 Fatigue Risk Management Work Group Recommendations and Implementation

Component	Recommendation/Implementation
FRMS	<p>1. Design and implement an FRMS within the ATO operational environment. FAA ATO established its Fatigue Risk Management system in January 2012, via a Charter, agreed to and signed by the FAA, NATCA and PASS. FAA ATO JO 1030.7A (2012) formally established the ATO Fatigue Risk Management program as the cornerstone to the ATO implementing a fatigue risk management system.</p> <p>2. Continue to support the post-recommendation work efforts by creating a transition team composed of Article 55 FRM Work Group members until the formal ATO FRMS is established. A Post-Article 55 FRM Workgroup met in early 2011, completed the agreements resulting in the July and August FAA/NATCA Fatigue MOU and Fatigue MOU Guidance (2011) and then collaborated to establish the ATO FRMS as referenced in recommendation 1 actions above.</p>
Scheduling	<p>3. Provide a minimum of nine hours between evening and day shifts. FAA/NATCA Fatigue MOU (2011): <i>The Parties recognize the need for watch schedules that meet operational needs and mitigate system risks due to fatigue. In response to the scientific data supplied by the Article 55 workgroup, the Parties agree that employees are required to have a minimum of nine (9) consecutive hours off-duty preceding the start of a day shift. For purposes of this document only, a day shift is generally defined as a schedule where the majority of hours fall between 7:00 a.m. and 4:00 p.m. This requirement applies to all shift changes, swaps, and overtime to include scheduled, call-in, and holdover assignments.</i></p> <p>4. On a 2-2-1 counterclockwise (CCW) rotation, reduce the day shift preceding the first midnight shift from eight to seven hours, and begin that shift one hour later, to provide the opportunity for an extra hour of restorative sleep at the end of the nighttime sleep period. FAA/NATCA Fatigue MOU Guidance (2011): <i>Consistent with the Article 55 Workgroup recommendations, for those facilities that utilize 2-2-1 counterclockwise schedules, it is encouraged that schedules be constructed to reduce the day shift preceding the first midnight shift from eight to seven hours, and begin that shift one hour later, in order to provide the opportunity for an extra hour of restorative</i></p>

sleep at the end of the nighttime sleep period.

This reduced shift duration would be offset by adding the hour to a shift, or a combination of shifts, earlier in the workweek. It is recommended that the additional time be scheduled either at the beginning of a normal evening shift(s), or at the end of a normal day shift(s), so as to not infringe on nighttime sleep.

Such schedules would be constructed as an Alternative Work schedule (AWS) and would require employees to volunteer. In the event that there are insufficient volunteers, this AWS schedule cannot be implemented and existing 2-2-1 counterclockwise scheduling practices may be utilized.

(This recommendation was not implemented as a regulation, but is available as a component of AWS.)

Recuperative Breaks

5. Modify current policy, orders, etc., to permit naps during relief periods (breaks).

FAA JO 7210.3Y, Section 2-6-6, Relief Periods, Paragraph c., was modified with the following language:

Personnel performing watch supervision duties must not condone or permit individuals to sleep during any period duties are assigned. Any such instance must be handled in accordance with applicable Agency policy and the applicable collective bargaining agreement.

The above clarified that sleeping while on duty is prohibited. Notably, it did not explicitly prohibit controllers from sleeping while on a recuperative break.

6. In addition to normal breaks on midnight shifts, include a provision for a recuperative break for 2.5 hours, which incorporates time to overcome sleep inertia should an employee choose to nap.

FAA/NATCA Fatigue MOU Guidance (2011):

Employees are permitted to have break periods away from their assigned duties to sufficiently recuperate from the effects of fatigue, if needed, attend to personal needs, and rejuvenate their mental acuity.

Length of recuperative breaks on midnight shifts shall be longer than those normally provided during other shifts, to the maximum extent possible, considering staffing and workload, consistent with the recommendations of the Article 55 Workgroup.

The above recognizes the need for longer breaks on midnight shifts.

Activities that rejuvenate mental acuity are not specified.

Sleep Disorders

7. Create policies and procedures that encourage self-initiated evaluation, diagnosis, and demonstration of initial treatment effectiveness of Sleep Apnea (SA) by removal or reduction of economic disincentives.

Obstructive Sleep Apnea was covered in an article titled *Obstructive Sleep Apnea: Know the Signs, Take Action*, in Focus FAA (2016). Sleep disorders (including sleep apnea) have been included in the ATO Fatigue Awareness and Countermeasures Training

Part I – Fatigue Basics, Section1, secondary contributors to fatigue – Sleep Disorders, and

Part II – Sleep basics, Section 6, Sleep Disorders.

8. Use AAM-prepared SA education to build sleep apnea awareness in the ATO workforce, include raising awareness of respiratory coaching to SA patients.

Sleep disorders (including sleep apnea) have been included in the ATO Fatigue Awareness and Countermeasures Training

9. Aerospace Medicine:

- AAM to stay current with state of the art in sleep medicine
- AAM to utilize AASM standards and practices for SA risk factor identification, diagnosis and treatment standards
- AAM to document the process for medical qualification for individuals at risk for sleep apnea
- AAM to develop educational materials for the workforce and AMEs
- AAM to educate AMEs on SA

OSA materials for AMEs have been developed and published on the FAA Guide for Aviation Medical Examiners Website (2016).

Personal Fatigue Management

10. Develop policy and education for employees designed to minimize fatigue and report fit for duty, and action to be taken when they consider themselves too fatigued to safely perform their duties.

FAA/NATCA Fatigue MOU (2011) states the following:

***Section 8.** All operational personnel are obligated by their significant safety duties and professional responsibilities to prepare for duty with consideration for being well-rested and mentally alert. It is the employees' responsibility to recognize and report to their supervisor when they are unable to perform operational duties due to fatigue. Upon request, employees that self-declare as unable to perform operational duties due to fatigue will be granted leave in accordance with the leave provisions contained within the 2009 CBA. Additionally, at his/her request, an employee that self-declares as fatigued, shall be assigned other facility duties, to the extent such duties are available. If no such duties are available, the employee will be granted leave as described above.*

The FAA's ATO Operational Supervisors Workshop, Fatigue Lesson, reviews scenarios when employees might self-declare fatigue, and the responsibilities of the manager in those situations.

11. In order to avoid on-the-job fatigue that threatens safety, develop policy and education for managers that incorporates emphasis on a non-punitive approach when an employee, in accordance with the developed policy, self-declares as too fatigued to safely perform operational duties.

The FAA's ATO Operational Supervisors Workshop, Fatigue Lesson, reviews scenarios when employees might self-declare fatigue, and the responsibilities of the manager in those situations.

Fatigue Education

12. Update existing fatigue awareness training to reflect current science and to provide applications specific to all people in certain occupations personalize the application of the training.

ATO Fatigue Awareness and Countermeasures Training programs have been developed for air traffic controllers and technicians. These electronic courses reflect current science and methods to personalize the training and make it relevant to the learner. Additional fatigue lessons are instructor-led and are delivered at the Mike Monroney Aeronautical Center in Oklahoma City, for Air Traffic Controllers. All of the content for these lessons reflects current science and is intended to allow learners

to reflect on what they learn to make better choices regarding sleep and fatigue.

Summary

Fatigue presents an acknowledged hazard to the safety of the NAS and to the health and well-being of FAA employees. By raising awareness of fatigue and ways to reduce its impact, FAA will work to make the FAA a better and safer place to work, while improving the safety of the NAS. Keeping stakeholders informed of the FAA's efforts in fatigue safety is important to maintaining the public trust placed in the agency.

Acknowledgment

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