U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Fitness for Duty

Date: XX/XX/10

Initiated by: AFS-200

AC No: AC 120-FIT

Change:

1. **PURPOSE.** This advisory circular (AC) was developed to demonstrate acceptable methods of compliance with Title 14 of the Code of Federal Regulations (14 CFR) proposed part 117, § 117.5. While the methods outlined in this AC are not the only means of compliance, the information contained herein provides concepts for developing appropriate processes and procedures to comply with § 117.5 and instituting appropriate operator-specific fatigue countermeasures. The information also provides a means to educate crewmembers in the potential of fatigue induced by commuting. In addition, this AC provides the general public with an in-depth understanding of crewmember commuting behaviors by highlighting the reasons crewmembers commute.

2. **AUDIENCE.** This AC applies to air carriers, crewmembers, employees of air carriers responsible for scheduling crewmembers, pilot labor organizations, airline industry trade organizations, and the general public.

3. **RELATED CFR REFERENCES AND READING MATERIAL.**

- Title 14 CFR parts 91, § 91.13; 117; and 121.
- AC 120-100, Basics of Aviation Fatigue.
- "Proposed Draft" AC 120-FT, Fatigue Training.
- AC 120-103, Fatigue Risk Management Systems for Aviation Safety.
- Safety Alerts for Operators (SAFO) 09014, Concepts for Fatigue Countermeasures in Part 121 and 135 Short-Haul Operations.

4. **BACKGROUND.**

a. **Fit for Duty.** Part 117 requires each crewmember assigned to a flight duty period to be fit for duty prior to commencing a flight. Section 117.5 defines "fit for duty" as being physiologically and mentally prepared and capable of performing assigned duties in-flight to the highest degree possible of safety in public interest as required in Title 49 of the United States Code (49 U.S.C.) § 44702. This requirement includes the crewmember being properly rested.

b. **Fatigue.** Fatigue is characterized by a general lack of alertness and degradation in mental and physical performance. Fatigue manifests in the aviation context not only when pilots fall asleep in the cockpit while cruising, but perhaps more importantly during the task-critical takeoff and landing phases of flight. Reported fatigue-related events have included procedural errors, unstable approaches, lining up with the wrong runway, landing without clearances, and poor decision making. There are three types of fatigue: transient, cumulative, and circadian:

(1) Transient fatigue is acute fatigue brought on by extreme sleep restriction or extended hours awake within 1 or 2 days.

(2) Cumulative fatigue is fatigue brought on by repeated mild sleep restriction or being awake for extended hours during a series of days.

(3) Circadian fatigue refers to the reduced performance during nighttime hours, particularly during an individual's "window of circadian low" (typically between 2:00 a.m. and 05:59 a.m.).

c. **Fatigue Symptoms.** Common symptoms of fatigue include:

- Measurable reduction in speed and accuracy of performance,
- Lapses of attention and vigilance,
- Delayed reactions,
- Impaired logical reasoning and decision making, including a reduced ability to assess risk or appreciate consequences of actions,
- Reduced situational awareness, and
- Low motivation.

d. **Benefits of Adequate Sleep.** Scientific research and experimentation consistently demonstrate that adequate sleep sustains performance. For most people, 8 hours of sleep in every 24 hours sustains performance indefinitely. Sleep opportunities during the windows of circadian low are preferable, although some research indicates that the total amount of sleep is more important than the timing of the sleep. Within limits, shortened periods of nighttime sleep may be nearly as beneficial as a consolidated sleep period when augmented by additional sleep periods, such as naps before evening departures, during flights with augmented flightcrews, and during layovers. Sleep should not be fragmented by interruptions or environmental conditions such as temperature, noise, and turbulence, which can impact how beneficial sleep is and how performance is restored.

5. **FITNESS FOR DUTY – A JOINT RESPONSIBILITY.** Fitness for duty is a joint responsibility of the air carrier and the crewmember. Part 117 recognizes the need to hold both air carriers and pilots responsible for making sure crewmembers are working a reasonable number of hours, getting sufficient sleep, and not reporting for flight duty in an unsafe condition. Many of the ways that air carriers and crewmembers negotiate this joint responsibility are

handled in the context of labor management relations and agreements. Although not all crewmembers are represented by a labor organization, those that are will have specific labor agreements addressing this issue.

a. **Monitoring Fatigue.** Part 117 directly imposes regulatory obligations on both air carriers and crewmembers. This is purposeful recognition that responsibility for fitness for duty goes beyond the policies, procedures, and practices of an operator/air carrier. The Federal Aviation Administration (FAA) will closely monitor and take the appropriate action against air carriers that schedule right up to the maximum duty limits, assign crewmembers that have reached their flight time limits additional flight duties under part 91 (general aviation operations), and exceed the maximum flight and duty limits by claiming reasonably foreseeable circumstances are beyond their control. Equally, crewmembers that pick up extra hours, moonlight, commute irresponsibly, or simply choose not to take advantage of the required rest periods also would be operating at reduced levels of alertness and may be subject to FAA enforcement action. One important element of part 117 is that crewmembers may not accept an assignment that would consist of a flight duty period if they are too fatigued to fly safely. Likewise a crewmember may not continue subsequent flight segments if he/she has become too fatigued to fly safely.
Air carriers must assess the crewmember's state when they report to work. If the air carrier determines a crewmember is too tired, it may not allow the crewmember to fly. Crewmembers should be cognizant of the appearance and behavior of fellow crewmembers for signs of fatigue. If a crewmember (or any other employee) believes another crewmember may be too tired to fly, he/she must report their concern to the appropriate management person, who must then be required to determine whether the individual is sufficiently alert to fly safely.

b. **Evaluating Fatigue.** In addition, part 117 requires air carriers to develop and implement an internal evaluation and audit program to monitor whether crewmembers are reporting to work fatigued. The FAA anticipates that the program would look at both the number of instances in which this happens as well as the reasons contributing to the problem. An air carrier will need to take steps to correct any fatigue problem. For example, if the air carrier became aware that crewmembers were commuting during their windows of circadian low, the air carrier could require that all crewmembers spend the night within the local commuting area prior to starting a series of flight duty periods. For the purpose of this AC, the FAA has defined "local area" to mean any location no more than 2 hours of transportation, regardless of the mode of transportation, to the physical location of the crewmember's domicile or the location where the flight duty period starts. The air carrier could also implement other measures to address problems associated not only with commuting, but any behavior that could lead to crewmembers reporting for flight duty periods unfit for duty.

6. MITIGATING THE POTENTIAL FOR FATIGUE.

a. **The Causes of Fatigue.** The FAA defines fatigue as a physiological state of reduced mental or physical performance capability resulting from lack of sleep or increased physical activity that can reduce a crewmember's alertness and ability to safely operate an aircraft or perform safety-related duties. The primary contributor to fatigue is lack of proper sleep. The root cause for crewmember fatigue may be a combination of scheduling and crewmembers not taking advantage of their assigned sleep opportunity.

b. **The Effects of Fatigue.** The effects of fatigue are predicated upon the degree of the individual's sleep debt, but not specifically limited to that sleep debt. Small reductions in sleep over a given time period create the accumulation of sleep loss, which is referred to as sleep debt. The only way to eliminate cumulative sleep debt is to obtain sleep because it addresses the underlying physiology of sleep loss. The effects of fatigue manifest in slightly different ways for each person. However, there are common effects that are associated with tiredness (e.g., weakness, lack of energy, lethargy, depression, lack of motivation, sleepiness, decreased alertness and situational awareness, and poor decision-making skills). Fatigue decreases a person's ability to perform cognitive tasks and increases variability in performance as a function of time on task.

c. **Recovery Sleep.** To reverse the effects of fatigue, people must receive "recovery sleep." The period for recovery sleep may be different for each person because one person's need for required sleep may vary from that of another person. Some people may require 8 continuous hours of sleep while others may require more than 8 continuous hours.

d. **Managing or Mitigating the Effects of Fatigue.** There are two central elements to managing or mitigating the effects of fatigue.

(1) The first is each air carrier preparing their schedules in a manner that accommodates enough time to allow an appropriate sleep opportunity.

(2) The second is crewmembers taking full advantage of each sleep opportunity to ensure they receive adequate sleep and are properly rested before starting a flight duty period.

e. **Proper Rest Requirements.** Each crewmember is required, as prescribed in § 117.5, to be properly rested to safely perform their assigned duties. Equally, each air carrier has the responsibility to ensure that no crewmember is scheduled (assigned) or may continue a flight duty period if that crewmember has reported to the air carrier that they are too fatigued to perform their assigned duties. Air carriers must remove a crewmember from the flight duty period if the air carrier has determined that crewmember is too fatigued to safely perform their assigned duties.

f. **Dispatch or Flight Release Documentation.** As a means to attest the crewmember's fitness for duty, each crewmember will affirmatively state that they are fit for duty by signing their name in the designated area of the dispatch or flight release for that flight. This must be accomplished for each flight when that crewmember is an operating or augmented crewmember. By signing the dispatch or flight release, the crewmember attests they are properly rested to perform their assigned duties for that planned flight. For operations conducted under part 91 for the air carrier, the air carrier must provide dispatch or flight release documentation for that flight. Regardless of whether the flight is conducted under part 91 (general aviation operations) or 121 (air carrier operations), the flight may not be operated until this requirement is met.

7. MANAGING REST.

a. **Rest and Sleep Opportunity.** Air carrier and crewmembers must understand that a rest opportunity and a sleep opportunity are two separate issues. A rest opportunity is an assigned

period prior to a duty assignment while a sleep opportunity period resides within that rest period. The sleep obtained within the sleep opportunity is critical to being fit for duty.

b. **Rest Periods.** Managing rest is the means for managing the risk of being unfit for duty because of fatigue. This is the joint responsibility of the air carrier and the crewmember. It's unrealistic to assume that a 9-hour rest period will yield 9 or even 8 hours of sleep by the crewmember. The reality is that a 9-hour rest period may yield 7 hours of sleep when you take into consideration the time lost in checking in at a hotel, eating, and preparing to resume duty at the conclusion of the sleep opportunity. For this reason, § 117.25 (d)(1) states that the rest period is measured from the time the crewmember reaches the hotel or other suitable accommodation. As a means to manage rest, the air carrier needs to ensure the hotel is located within an acceptable distance from the airport and eateries are close by. Further, air carriers should make arrangements with the hotel to ensure that crewmember's rooms will be available upon check in and the rooms are quiet for sleep.

c. **Obtaining Proper Rest.** Crewmember's have a responsibility to ensure they are properly rested before starting a flight duty period. It's unacceptable for a crewmember on a rest period to not obtain the proper rest before starting a flight duty period. Each crewmember has the responsibility to be fit for duty prior to accepting that assignment. In an effort to comply with § 117.5, the crewmember must fully take advantage of the sleep opportunity during their assigned rest period.

8. **FATIGUE TRAINING.**

a. **Training Requirements.** The FAA believes fatigue-based training requirements are critical to informing crewmembers how their personal behavior can unwittingly lead to fatigue and how to mitigate the risk of fatigue in an industry that does not follow a traditional work cycle. The FAA believes that crewmembers are not the only employees of the air carrier who need to be trained about the impact of fatigue on the safety of flight. The FAA requires fatigue training for flightcrew members, dispatchers, individuals involved in the scheduling of flightcrew members, individuals involved in operational control, and any employee providing management oversight of those areas.

b. **Recognizing Fatigue.** Part 117 requires training as a means to educate and prepare crewmembers, and other employees of the air carrier, to properly manage rest and to recognize the personal symptoms of fatigue along with recognizing fatigue in co-workers. While it is important for crewmembers to recognize personal fatigue, it is equally important for crewmembers and other employees of the air carrier to recognize the symptoms of fatigue in other crewmembers. For this reason, § 117.5(d)(e) requires that crewmembers, and all other employees of the air carrier, report crewmembers who appear to be fatigued or unfit for duty. Once notified of the possible fatigue, the air carrier is required by § 117.5(e) to evaluate that crewmember for fitness for duty. The evaluation must be conducted by a person trained and qualified in accordance with § 117.11 and that evaluation must be conducted before the crewmember begins or continues a flight duty period.

c. **New-Hire and Recurrent Training.** Section 117.11 requires that each air carrier conducting operations under part 121 provide initial new-hire and annual recurrent fatigue

training for each person involved with scheduling aircraft and crews, all crewmembers and management personnel. Each air carrier is required to develop an initial new-hire and recurrent fatigue training module that will be incorporated into the air carrier's operator-specific ground training curriculum. The regulation requires 5 hours of initial training for all newly-hired, covered employees prior to starting work in that capacity and 2 hours of annual, recurrent training. In addition, if the air carrier has an FAA-approved Fatigue Risk Management System (FRMS) as part of the approval process, the air carrier must develop an initial new-hire and recurrent FRMS training module to be incorporated into their operator-specific ground training curriculum.

d. **The Study of Fatigue and Fatigue Education.** The FAA recognizes that the study of fatigue and fatigue mitigation is ongoing. Changes may need to be made to training programs to adapt to advances in fatigue science and mitigation. For this reason, whenever the Administrator finds that revisions are necessary for the continued adequacy of an approved fatigue education and training program, the air carrier will be required, after notification, to make any changes in the program that are deemed necessary by the Administrator.

9. BACKGROUND ON COMMUTING.

a. **Commuting from Domicile.** For years, crewmembers have commuted to and from their domicile without incident. Mostly, crewmembers have done so in a professional and responsible manner, recognizing the importance of making provisions to ensure they are properly rested and fit to assume any duties assigned by their air carrier.

b. **General Public's Perception of Commuting.** Crewmembers commute for a variety of reasons, which are usually attributed to their personal needs. Unlike the vast majority of U.S. workers spanning other industries, crewmembers have the unique opportunity to live in another city or region other than the one where they are based. The general public does not fully understand the concept principally because they are unfamiliar with airline industry practices. As a result, the general public may draw conclusions that may or may not be appropriate.

c. **Seniority System.** As a general rule, most of the airline industry has adopted some form of a seniority system that awards crewmembers with a better lifestyle based upon the crewmember's longevity with the air carrier. The seniority system is the basis for where a person works, what aircraft the crewmember flies in, what duty position (pilot, co-pilot, etc.) one serves in, what days of the month one works, the locations that one flies to from home base, the amount one is paid, and even the days that one can be assigned vacation. All this is accomplished by the crewmember submitting a bid (a request of choices listed in order of preference) for a vacancy for duty positions, equipment, or domiciles as they become open. A separate bid is used for awarding monthly flight schedules, reserve assignments, and vacation schedules. The crewmember with the highest seniority bidding for an award is awarded their first choice. The crewmember with the next-highest seniority is awarded (assigned) their first choice provided it does not conflict with an award previously awarded. The process continues until all bids are awarded. The bidding process directly defines the crewmember's lifestyle and work schedule.

d. **Collective Bargaining Agreements (CBA).** Most part 121 crewmembers are represented by a labor organization and have CBAs in place to define the crewmember's work rules. These

CBAs provide for a standardized seniority system predicated on the labor organization's policy supporting and preserving the crewmember's seniority. As a result of this process, crewmembers with more seniority have a better lifestyle and work schedule.

e. **Advantages of Crewmember Seniority.** Crewmembers usually focus on three issues of importance to them and their families: their domicile or home base, their duty position, and the type of aircraft they fly. A crewmember's seniority determines where they are domiciled, their duty position, and the type of aircraft flown. These are important issues to crewmembers as they directly relate to economics (e.g., pay and cost of living).

f. **Domiciles.** In the aviation industry, the term "domicile" means the work location of the crewmember rather than the "home" of the crewmember. Depending on seniority assignments a crewmember's home could be at the same place as their domicile, but often that is not the case. Domiciles represent cost of living issues as well as quality of life issues for the crewmember and their families.

10. **WHY CREWMEMBERS COMMUTE.**

a. **Economics and Quality of Life.** There are various reasons why crewmembers commute to their domicile. However, we can point to two primary reasons that drive crewmembers to become commuters: economics and quality of life. To understand this, it's useful to have an insight regarding careers in the air carrier industry. Due to the desire to "move up" or multiple mergers, acquisitions, and bankruptcies in the industry, most crewmembers have worked for more than one airline in their career. Sometimes this is a result of career progression (moving up) in which a crewmember follows a path from starting their first airline job with a regional airline, moving on to a national airline, and then finally getting hired with a major airline. The path and length of a crewmember's career progression depends less on desire to move up than upon the state of the economy and the growth of the airline industry. Throughout their career path, crewmembers opt to maintain the stability of their family and elect to commute back and forth to work instead of relocating their family to their domicile every time they change employers or the employer relocates the crewmember's domicile. Most airline schedules have the crewmember on 2, 3, or 4-day trips. Because of the design of the trip sequence, crewmembers on 3 or 4 day trips typically commute to and from work once a week whereas crewmembers on 2-day trips typically commute in and out of their domicile twice a week.

b. **Compensation.** Duty position and the type of aircraft flown directly correlate to economics. Typically, the larger the aircraft, the more compensation can be expected. The same can be said for duty position. Crewmembers holding a captain's position earn more than those holding a first officer's position.

c. **Displacement.** When an air carrier's business model changes, the crewmember's status will often change, too. An air carrier may make a business decision to downsize a domicile, relocate equipment to another domicile, or take that equipment out of service (OTS). This will result in some crewmembers being displaced (no positions available) to a different aircraft and domicile. The degree of displacement may force some crewmembers to change domiciles, duty positions, or equipment. In the worst case the crewmember may be furloughed. However, the crewmember may have enough seniority to remain at their domicile but be awarded a different

duty position resulting in lower compensation. A more severe degree of displacement may result in the crewmember being furloughed because their seniority was not high enough to be awarded any award based on the displacement. In some industries this is referred to as a reduction in force (RIF).

d. **Loss of Compensation.** As previously stated, changes to one's duty position or equipment usually results in a loss of compensation. When such actions occur, crewmembers will attempt to preserve their lifestyle by changing domiciles because their seniority would maintain the same duty position and equipment award (pay), though in a different domicile. However, if their current domicile is of utmost importance to them, the flightcrew may have to bid for different equipment to hold their duty position.

e. **Relocation.** While furloughs are a severe consequence for crewmembers, when a crewmember's air carrier ceases operations the consequences are more severe. Like any other person, crewmembers will attempt to seek follow-on employment in their industry but from a different air carrier. This means that they may need to take a new job with a domicile far away from their home and, perhaps, with limited transportation options for getting to and from work. Examples of such issues are relocating their family to a more expensive area, attempting to sell their homes while taking up residence at their new domicile, or commuting to their new domicile. Moreover, air carriers offer limited or no reimbursement for relocations.

11. **COMMUTING STRESSES.**

a. **Domicile-Related Stress.** While commuting to and from a domicile, crewmembers encounter stress not normally experienced when living within the local area of their domicile. Examples of these stresses include ensuring they arrive at their domicile for flight duty in a timely manner, planning for potential delays, preparing for potential changes in the mode of their commute, and adapting to sudden changes that are out of their control such as weather disruptions. Depending on the method of commuting the crewmember uses, the level of stress varies.

b. **Reporting for Duty.** If conditions permit, a crewmember living outside of the local area of the domicile may be able to drive back and forth to their domicile. However, this presents pressures for the crewmember relative to traffic and delays. Therefore, it is prudent that the crewmember plan to arrive early enough at their domicile to create a buffer for such delays. This results in the crewmember arriving well before the time they are required to report. Depending upon the personal time buffer the crewmember uses, they may have an extended period of time between their arrival at work and their report time for a flight. This extends the length of their day at work, though not their work day.

c. **Commuting by Air.** Commuting by air is a common choice for crewmembers. This mode provides the greatest flexibility for the crewmember with regard to where they actually live. However, the total travel time between the crewmember's residence and their domicile has the potential for a long day. One part of this problem is the available air service into the domicile from the home location. Flexibility and creativity are essential elements to having a successful commute and to reducing stress. The downside to commuting is the total travel time involved with the commute, the lack of frequency in air service, and the loss of off duty time.

d. **Planning the Commute.** Crewmembers commonly plan their commute so that they have at least three flights to get to their domicile. If the flight schedules are less frequent, the total commuting time will increase substantially. The further the crewmember lives from their domicile the more complicated the commute becomes.

e. **Losing Time Off.** Probably the biggest disadvantage to commuting is the loss of time off. Because all time commuting is accomplished during crewmembers' time off, a lot of the crewmember's time off is consumed by the commute. In an effort to compensate for the loss of time, crewmembers will often commute to work just before their report time, which increases the level of stress and increases the level of fatigue for that day.

12. **HOME-BASED CREWMEMBERS.**

a. **Home-Basing.** Air carriers conducting supplemental or non-scheduled operations often do not have established domiciles. Rather than having domiciles, these air carriers will send crews to locations where the airplanes are located, which can be anywhere in the world. This is a direct result of the on-demand type of operations supplemental air carriers typically conduct. Since the air carrier does not have a domicile, the air carrier will base their crewmembers at the member's home location. Home-basing is the industrial term used to define this kind of basing.

b. **Trip Length and Rest Time for Supplemental Operations.** Crewmembers employed by air carriers conducting supplemental operations tend to have much longer trips than those pilots employed by domestic and flag (international scheduled) air carriers. Typically, their trips consist of 16 to 20 days with 10 to 14 days off during that month. Another issue unique to the supplemental industry is that the air carrier will use scheduled air carriers or ground transportation to send crewmembers to the airport where the airplane is located on the first day of their trip. In this case the crewmember then checks in to a hotel provided by the air carrier and normally uses the time between arrival at the aircraft location and departure to rest in preparation for the flight.

13. **COMMUTING AND DEADHEAD TRANSPORTATION.**

a. **Public Perception of Deadheading.** There has been quite a bit of confusion on the part of the general public with regard to the terms "commuting" and "deadhead transportation" or "deadheading." Both are transportation terms normally used by the airline industry. The term "deadhead" actually originated in the railway industry and became part of the airline industry's transportation jargon.

b. **Background.** From the 1850s, the term deadhead was used to identify a person who traveled on a train without paying, either free-loading or on a complimentary basis. The meaning of the term was further expanded to refer to a train crew traveling as passengers, either to start work somewhere else or to go home. This term was expanded by the end of the 19th-century to refer to a vehicle (at first using a train) traveling without cargo or passengers, a trip that, like a non-paying employee, was making no contribution to revenue but was necessary for business purposes.

~~b.~~c. **Airline Industry Definition of Deadheading.** The airline industry refers to the term deadheading as any time that an air carrier assigns a crewmember to be transported by a mode of transportation, usually by air, from one location to another and that same crewmember is not

functioning as an operating flightcrew member. Like the earlier definition, a deadheading crewmember does not generate revenue for the air carrier. Normally, the concept of deadheading is used to move a crewmember so that they can be in position to function as an operating crewmember for a flight or series of flights. In basic terms, deadheading is an air carrier's means of matching crews with the location of their aircraft.

~~c.~~d. **Concept of Commuting.** In contrast, the concept of commuting involves an individual crewmember that does not reside within the local area of their domicile or place of work. This crewmember then uses some mode of transportation to get to and from their domicile. Most commuters prefer to commute by air as it provides them with the most flexibility. Unlike deadheading, the commuting crewmember is solely responsible for determining and using the mode of transportation to commute to and from their domicile. In basic terms, commuting is an individual-initiated function.

~~d.~~e. **Getting To and From Work.** Crewmembers that are home based by their respective air carrier (e.g., supplemental air carriers) have a unique situation with regard to getting to and from work. Since the air carrier normally does not have established domiciles, crewmembers are sent from their home location via a scheduled air carrier to the place where they will begin their assigned duties as an operating crewmember. The air carrier will purchase tickets for their crewmembers and the crewmember will travel as a passenger. This is referred to in the industry as "commercialling" and has no true relationship to deadheading or commuting. Crewmembers typically have little influence on their transportation as this is arranged by their air carrier.

14. **COMMUTER-INDUCED FATIGUE.**

a. **Extended Days.** While commuting offers many benefits to the crewmember, the stresses associated with commuting contribute to crewmember fatigue. More importantly, commuting contributes to the length of a crewmember's day, which also has the potential for contributing to fatigue.

b. **Unplanned Commute Time.** Commuters normally plan their commute so they have at least three options (three flights) to arrive at their domicile before their report time. This results in the crewmember usually arriving at their domicile several hours before their report time. If a crewmember's first day of their trip is scheduled for 10 hours of duty and their commute requires another 4 hours, and assuming they arrive at their domicile 3 hours prior to their report time, the crewmember's first day could exceed 17 hours without a rest period. Since air carrier schedules are designed to account for the scheduled flight duty time, the additional time associated with a commute may add to the crewmember's fatigue for that day as well as aggravating the cumulative fatigue for the duration of the crew's schedule that the carrier had planned.

c. **Lack of Proper Rest.** In an extreme example, a crewmember may have a scheduled report time for 8 a.m. with a 12-hour duty day. Since there is only one flight in the morning arriving at their domicile, the crewmember elects to commute through the night to their domicile on a cargo carrier. The crewmember assumes they will get some sleep during the commute and when they arrive at their domicile in the morning, they then report for their intended 12-hour flight duty period. In this example, the crewmember has the potential of being awake and not properly rested for at least 23 consecutive hours. One can see that unless the crewmember slept

before starting their commute they will have completed their first day of the trip without a proper rest period in the previous 24 to 36 hours. This creates an unsafe operating condition that is contrary to 14 CFR. Therefore, it is imperative that crewmembers seriously evaluate their commuting habits to reduce the potential for being fatigued as a result of commuting.

15. **MANAGING THE COMMUTE.**

a. **Local Area.** The FAA defines "local area" to mean any location no more than 2 hours transportation, regardless of the mode, to the physical location of the crewmember's domicile or the location where the flight duty period starts. Travel from outside the local area is commuting. It must be understood that the 2-hour limit encompasses the entire length of the journey. In essence, the 2-hour limit starts from the time the crewmember leaves their home and terminates when they arrive at the physical location of their domicile or the location where their flight duty periods begins.

b. **Scheduling for Commuting Crewmembers.** In light of this definition of commuting, air carriers have a responsibility to take into consideration the potential effects of fatigue when building schedules, especially when they know the crewmembers are commuting to their domicile. Air carriers should have a commuting policy to address their expectations from crewmembers commuting to work. Some air carriers currently have such a policy and are aware of those crewmembers who commute, thus these carriers design schedules to mitigate potential risk of fatigue for those commuters. Air carriers should also provide crewmembers with a quiet area at the domicile where they can take advantage of rest before or between flights. Under part 117, each air carrier must play an active role to ensure their crewmembers are fit for duty throughout the crewmember's assigned flight duty period.

c. **Inducing Fatigue.** Equally, crewmembers should commute responsibly as part of being fit for duty. They should take advantage of quiet areas before and between flights, as provided by the air carrier, to reduce fatigue. More importantly, crewmembers need to plan their commute so that the additional time in travel does not induce fatigue for that day or contribute to a cumulative effect. In the case of an early report time for the next day, such planning may include arriving at their domicile the night before. Commuting throughout the night or even through the individual's window of circadian low is not a responsible method of commuting. This kind of behavior latently fosters the effects of fatigue that may lead to an incident, accident, or a pilot deviation. Crewmembers have an obligation under the rule to be fit for duty throughout their assigned flight duty period. To that end, crewmembers must properly plan their commute in a manner that does not induce potential effects of fatigue during their assigned flight duty period.

16. **FIT FOR DUTY – CREWMEMBER'S RESPONSIBILITY.**

a. **Windows of Circadian Low.** Individuals living on a regular 24-hour routine with sleep at night have two periods of maximum sleepiness, also known as windows of circadian low. One occurs at night, roughly from 2-6 a.m., a time when physiological sleepiness is greatest and performance capabilities are lowest, and the other is in the afternoon, roughly from 3-5 p.m. These windows of circadian low are termed the primary and secondary. For the purpose of this AC, part 117 defines the primary window of circadian low as a timeframe of 0200 to 0559.

During this timeframe crewmembers will find their performance degraded as a result of the body requiring sleep.

b. **Sleep Drive.** The drive for sleep increases over time since the last sleep period and with any cumulative deficit in sleep relative to the average 8-hour day requirement. As a consequence, the sleep drive is at its lowest point in the morning, upon awakening, and as the day progresses, the drive to sleep increases and the ability to sustain attention and engage in cognitive activities decreases. Once sleep begins, this drive gradually decreases until awakening.

c. **Alertness.** For the average person, the daily upswing in alertness produced by the circadian system tends to offset the decrease in alertness produced by depletion of the sleep regulatory process. The result is normal alertness and performance during the first 16 hours of the day. After about 16 hours of continuous wakefulness, most adults begin to notice reductions in the speed of performance and in alertness levels. However, the changes in behavior and alertness can be magnified by a prior history of insufficient sleep quantity and quality.

d. **Resting Prior to Flight Duty Period.** For this reason, crewmembers that commute to their domicile must understand that their commuting behavior may contribute to the potential effects of fatigue. For example, if a crewmember has a midday report time with an 8-hour flight duty period, and the crewmember commutes on an early morning flight, there is a high likelihood of fatigue. Without a rest period before starting the flight duty period, and taking into consideration the early morning wake that occurs during the window of circadian low, the crewmember could end up awake for 18 hours. Given this example, fatigue science has demonstrated that the crewmember's performance will be degraded. Such commuting practices elevate the risk for an incident, accident, or pilot deviation that may have been averted if the crewmember had received some rest prior to starting the flight duty period.

e. **Performance Degradation.** Some crewmembers commute through the night to arrive at their domicile for an early morning report time. This commuting practice results in significant fatigue-induced performance degradation. Considering a cumulative commute time of 10 hours (which is through the primary window of circadian low), plus a flight duty period of 13 hours, the crewmember could be awake for a minimum of 23 hours. Under this circumstance, the crewmember's performance has a strong potential for being degraded. This kind of activity promotes the potential for not being physically fit for duty which is contrary to Federal regulations, does not support a professional standard, and most importantly does not assure the air carrier will operate to the highest level of safety.

f. **Quality of Rest.** The FAA does not view commuting as rest. Some may argue that commuting on an aircraft provides the crewmember with the potential for rest. However, the quality of rest is called into question by various documented studies. Since most crewmembers will occupy either a coach class seat or the jump seat, the quality of rest is negligible. Likewise, occupying a first or business class seat that does not meet the criteria stated in AC 121-31, Flightcrew Sleeping Quarters and Rest Facilities, current edition, does not provide quality, effective, or restorative rest.

g. **Commuting During Windows of Circadian Low.** Part 117 defines the window of circadian low as a timeframe between 0200 and 0559. If the crewmember starts their commute

into their domicile after 0559, and their flight duty period starts at any time within a 7-hour window, the crewmember will not be required to have rest prior to their assigned flight duty period. However, if the crewmember's assigned flight duty period starts more than 7 hours after 0600, the crewmember must receive required rest in accordance with § 117.25 before their flight duty period. In the case of a flightcrew member commuting during the night through their window of circadian low, that crewmember must also receive a required rest period in accordance with § 117.25 before starting their assigned flight duty period.

17. **FIT FOR DUTY – AIR CARRIER'S RESPONSIBILITY.**

a. **Reporting and Evaluating Fatigue.** Whenever a crewmember reports to the air carrier that they are too fatigued to perform duties during their assigned flight duty period, the air carrier must perform an evaluation of that crewmember. The person performing the evaluation must be trained and qualified in accordance with the air carrier's fatigue education and training program, as prescribed in § 117.11.

b. **Administrator-Approved Evaluation and Audit Programs.** Part 117 requires each air carrier to develop and implement an internal evaluation and audit program approved by the Administrator that will monitor whether crewmembers are reporting for their assigned flight duty periods fit for duty. If it is determined that crewmembers are reporting in a condition not fit for duty, or the air carrier determines a crewmember is not fit for duty, or any other deficiencies associated with being fit for duty is determined, that air carrier must document each occurrence and the actions taken to correct noncompliance with § 117.5. This requirement includes any occurrence in which a crewmember self-reports not being fit for duty as a result of fatigue.

c. **Records, Reports, and Random Audits.** Additionally, part 117 requires each air carrier to have a process to facilitate fit for duty reports and respond appropriately to such reports. The air carrier is required to conduct random audits to assure that crewmembers are reporting fit for duty. Each air carrier must adopt a process by which each crewmember, as part of the dispatch or flight release, will affirmatively state that they are fit for duty prior to commencing that flight. Each air carrier must maintain the records required in accordance with § 117.5 for a minimum of 6 months.

d. **Fatigue Countermeasure Initiatives.** Fitness for duty is a joint responsibility of the air carrier and crewmember. The FAA will conduct random samplings of each air carrier to evaluate fitness for duty as part of routine random flight time, duty, and rest compliance surveillance. Therefore, the air carrier needs to develop and implement fatigue countermeasure initiatives, such as fatigue and commuting policies, to assure the air carrier conducts each operation to the highest level of air safety. Equally, crewmembers must commute in a responsible manner so as to prevent the potential effects of fatigue that may result as a contributing or causal factor to an incident, accident, or pilot deviation.

18. **CONTACT INFORMATION.** For more information about this AC, please contact the Air Transportation Division, AFS-200, at 202-267-6188.

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