
# Submission of Comments on Flightcrew Member Duty and Rest Requirements: Proposed Rule

## Docket No. FAA-2009-1093

November 15, 2010

INDEPENDENT PILOTS ASSOCIATION

Docket Operations, M-30
U.S. Department of Transportation
1200 New Jersey Ave., SE
West Building Ground Floor, Room W12-140
Washington, DC 20590

15 November 2010

RE: Submission of Comments on Flightcrew Member Duty and Rest Requirements: Proposed Rule, Docket No. FAA-2009-1093

Administrator Babbit:

The Independent Pilots Association (IPA), the bargaining unit for the 2900 pilots of United Parcel Service, has reviewed the proposed rules on Flightcrew Member Duty and Rest Requirements published in the Federal Register on September 14, 2010. We applaud the FAA for taking this first step in addressing the longstanding issue of pilot fatigue within the aviation industry. The IPA has been honored to participate in the FAA's long history of proposed rule making efforts on this issue for more than a decade. We have participated in the FAA's Reserve Rest ARAC in 1998, the URL industry/labor working group, panel member at the FAA Fatigue Management Symposium in 2008 and most recently an IPA flightcrew member was a representative on the 2009 ARC on Flightcrew Member Duty and Rest Requirements. We have also attended numerous fatigue conferences and symposiums and have adopted and currently utilize a bio-mathematical model for schedule evaluation.

As cargo pilots, we have witnessed first hand how difficult creating rules which are acceptable to the aviation industry has been. We are, therefore, heartened to see that many of the ARC's recommendations have been included in the proposed rules - most importantly, the FAA's commitment to one level of safety for all Part 121 operators - both passenger and cargo carriers alike. The uniform treatment of all pilots who fly under Part 121 is a significant step forward in securing the safety of American skies and promotion of the health and welfare of all Part 121 pilots and the public.

After a thorough review of the NPRM, the IPA has developed a list of continued concerns as well as answers to the questions posed by the FAA. Our comments to the rules, answers to the FAA's questions and supporting documents are attached herein. We look forward to the publication of the final rules and applaud the FAA for its dedication in creating rules, which will address the issue of pilot fatigue.

Sincerely,

Michael Moody, Jr
IPA At-Large Representative

Lauri Esposito
IPA Fatigue Committee Chairperson



3607 FernValley Road • Louisville, KY 40219-1916
502-968-0341 Fax: 502-968-0470
800-285-4472

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**FEDERAL AVIATION ADMINISTRATION**
**WASHINGTON, D.C.**

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## INDEPENDENT PILOTS ASSOCIATION'S COMMENTS

On behalf of the pilots who fly for United Parcel Service, the Independent Pilots Association (IPA) submits the following comments and responses to questions to the Notice of Proposed Rulemaking ("NPRM") for Flightcrew Member Duty and Rest Requirements.

### Introduction

The Independent Pilots Association (IPA) is the collective bargaining representative for the 2,900 pilots employed by United Parcel Service (UPS). UPS Co. (the airline division of UPS) began operations as a certified Part 121 carrier in 1988. Currently, it operates the world's ninth largest fleet of 238 jet aircraft including the Boeing 747-400, 757, 767, McDonnell-Douglas 11 and the Airbus 300. UPS operates on a hub and spoke (called "gateway") model with the main hub located in Louisville, Kentucky based primarily on set routes and flight schedules. It operates over 1,600 domestic and international flight segments daily, flying from hubs located throughout the United States and the world including Philadelphia, Pennsylvania; Dallas, Texas; Ontario, California; Rockford, Illinois; Columbia, South Carolina; Shenzhen, Hong Kong and Shanghai, China; and Cologne, Germany. While the UPS system is based on a hub and spoke model, the collective bargaining agreement dictates that pilots fly trips that begin and end at fixed crew bases (called domiciles) to gateways or other hubs throughout the UPS system. The fixed crew bases are: Louisville, Kentucky; Miami, Florida; Ontario, California; and Anchorage, Alaska. Domestically, UPS pilots fly packages into the main hub in Louisville, Kentucky and then out again once the packages have been sorted. Internationally, UPS flies long-haul trunk

routes, intra-Europe and intra-Asia flights and around-the-world flights. Unlike other cargo airlines which focus primarily on freight, UPS is the world's largest package delivery company.[1]

UPS' use of an extensive and intricate hub and gateway system to route packages throughout the world requires it to set airline schedules months in advance.[2] Like passenger airlines, set schedules means that UPS pilots fly several hundred block hours per year- well in excess of smaller cargo carriers who, because they move freight on demand, do not have set schedules.[3] Even though UPS' hub and spoke operations very closely resemble the type of operations witnessed in the passenger airline industry, one critical distinction remains: nighttime flying. UPS brown tails fly through the night to deliver the packages to the hubs where they are sorted and loaded onto UPS' brown trucks, which then delivers them during the business day. The back-side-of-the-clock air operations ensure timely, daylight arrival of thousands of packages at destination points around the globe.

Over the twenty-two years that UPS has operated its airline, our pilots have become well acquainted with the effects of nighttime flying. Many of our pilots have flown for passenger airlines and can speak to the distinction between daytime and nighttime flying. Our real world experience has shown us that nighttime flying is more onerous than daytime flying. We have experienced the debilitating effects of fatigue as a result of regularly operating during the window of circadian low[4] (WOCL) on a consistent basis in both the domestic and international arenas. The FAA cites three types of fatigue:[5] transient, cumulative and circadian. We support the FAA's acknowledgement that the pronounced impact of fatigue includes lapses of judgment, decrease in speed and accuracy of performance, loss of situational awareness and, most

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[1] UPS Pressroom, *UPS Fact Sheet*, http://www.pressroom.usp.com/Fact+Sheets/ci.UPS+Fact+Sheet (last visited Nov. 12, 2010)

[2] The UPS/IPA Collective Bargaining Agreement, Article 13.B.1.(a) requires that UPS publish all known flying on lines. A pilot's schedule is separated into 7 bid periods in a year. Six bid periods are 56 days long. The seventh is 28 days long. (*See* Article 2, Definitions, Bid Period). UPS builds its schedules at least a bid period in advance. Pilots bid and are awarded a schedule for each bid period in accordance with their seniority. (*See* Article 8.D).

[3] UPS pilots average approximately 550 block hours/year domestically and 650 block hours per year internationally.

[4] During the WOCL, body temperatures are the lowest and fatigue (if present) is most severe. Flight Duty Regulation Scientific Study Group, *A Scientific Review of Proposed Regulations Regarding Flight Crewmember Duty Period Limitations (1996)*.

[5] Flightcrew Member Duty and Rest Requirements, 75 FR 55852, 55855 (proposed Sept. 14, 2010) (to be codified at 14 C.F.R. pt. 117 and 121).

significantly, impaired decision making and risk assessment.[6] Based on the knowledge that operations during the WOCL present a higher level of exposure to fatigue than operations during daylight hours, it is readily apparent that a shorter flight duty period would be warranted during back-side-of-the-clock operations.

We fully expect that certain stakeholders will dispute the applicability of the proposed rules to cargo pilots by arguing the lack of sufficient scientific data and the economic impact on the cargo aviation industry in general. These arguments are negated by the primary aim of the proposed rules: to wit, "that pilots have an opportunity to obtain sufficient rest to perform their duties, with an objective of improving aviation safety."[7] Additionally, claims of economic devastation made by stakeholders are rebutted by the fact that the rule will apply equally to all Part 121 Stakeholders. Thus, the entire industry will bear the economic burden of the changes, not just one or two stakeholders.[8] Finally, the promulgation of these long overdue rules (with changes recommended by the IPA) will bring the regulations more in line with ICAO standards.

The IPA also applauds the FAA's acknowledgement that pilot fatigue is not different depending on whether the pilot operates domestically, internationally or as a supplemental operation. We wholeheartedly support the FAA's decision to apply one level of safety equally to all Part 121 certificate holders, passenger and cargo pilots, as well as to all Part 121 certificate holders when conducting flights under Part 91 of this chapter. We also encourage the FAA to continue to treat the Fatigue Risk Management System (FRMS) as a supplement to prescriptive regulations rather than a replacement for such regulations. Allowing FRMS to remain a supplement to rather than a replacement of prescriptive regulations will provide pilots with an equal or greater level of safety. Finally, using FRMS as a supplement will allow for further scientific studies to be completed within an existing framework.

The IPA also supports the concept that a flight crewmember must be fit for duty prior to operating an aircraft. The fitness for duty is and must be a joint responsibility of the certificate holder and the flight crewmember. While it is important that both the flight crewmember and the certificate holder be involved in fitness for duty determinations, we cannot create an environment that requires tracking and reporting the activities of an individual flight crewmember prior to

[6] Id.
[7] Id. at 55852.
[8] The IPA notes the similarity of economic claims made when the Whitlow decision was issued. Airlines claimed that Whitlow would put them out of business yet several years later, they are still operating under Whitlow.

their reporting for flight duty. Such tracking would be difficult and costly for the certificate holder and constitute an unwarranted invasion of the personal privacy of the flight crewmember. The proposed provision, Section 117.5, provides a framework for educating and encouraging responsible jointly managed commuting policies. The proposed 117.5 should be adopted as written. However, the accompanying Advisory Circular (AC 120-FIT) should be removed from the docket since the topic itself did not receive the same peer review and recommendations that other aspects of the proposed rule received during the ARC process. The IPA notes the FAA has chosen to take a path that is significantly different from ARC recommendations, as this was one area where all ARC members were in agreement. If it is the desire to continue down this path, all of the applicable stakeholders should have a similar opportunity to provide input in the process and a corresponding comment period following. We would recommend a process be set up where this occurs and would recommend an ARAC approach so that the problem is properly identified and jointly addressed.

The IPA also agrees with the FAA's decision to require that air carriers include administrative duties when calculating maximum cumulative duty limits. We suggest that for subordinate officials who engage in administrative duties as well as flying, the FAA place a duty period limitation of 65 hours a week, which cannot be increased. The rationale for this suggestion is that allowing stakeholders to increase the limit past 65 hours within a 5 ¾ day[9] period would have an adverse safety impact. Subordinate officials who have worked in an office all day and report to fly a nighttime duty period will be more likely to be fatigued. They should be held to the same limits of duty and rest as other flightcrew members. Failure to provide the same limitations for these individuals will burden other flightcrew members with the additional task of monitoring the fatigue level of these individuals. Finally, the IPA maintains that carriers must be responsible for tracking the time subordinate officials spend on administrative duties-duties which include answering e-mails at home and remaining on call at home for check airman assignments from the certificate holder.

The IPA supports the proposed rules. We do however note some areas of concern. We have included in our comments modifications to the rules, which we believe, if accepted, will provide a framework to ensure the safety of our airways.

[9] Proposed Rule 117.25 (b) "Before beginning any reserve or flight duty period, a flightcrew member must be given at least 30 consecutive hours free from all duty in any 168 consecutive hour period…"

# 117.7 Fatigue Risk Management System (FRMS)

## IPA Proposes:

**The FRMS section 117.7 of the proposed rule should clearly state that an FRMS is meant to address individual exceptions by pairing and city pairs, not to replace this entire proposed rule set for a specific carrier.**

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The IPA proposes the following changes:

We strongly support the introduction of FRMS in the U.S. Aviation System. We do, however, believe that Section 117.7(b) needs to be amended to include the following items:

- **The FRMS must be an equal partnership that includes the FAA, the certificate holder and non-management pilot representative.**
- **FRMS does not replace the regulatory scheme, its purpose is to supplement adequate prescriptive rules.**
- **Any FRMS must provide an equivalent or better level of safety and be centrally approved by the FAA. (One office at FAA headquarters should be responsible for approving FRMS. This is the only way to provide a uniform FRMS approval scheme.)**
- **FRMS should be limited to specific certificate holders' data and scheduled city pairs, which must be scientifically and then operationally validated by all stakeholders.**
- **FRMS, like SMS, requires a commitment from the certificate holder's senior management team and a specified line of accountability in the organization.**

A FRMS comprises a comprehensive range of procedures that are both scientifically based and data - driven, allowing a cooperative and flexible means of managing fatigue. There remains a requirement for the regulator to provide prescriptive flight and duty time rules for operators not embracing FRMS principles. Such a set of rules will also provide a base line against which the fatigue levels of any FRMS can be compared, and in the case where an FRMS does not provide at least an equivalent level of safety to the prescriptive scheme, provide a reversion. Operators may, subject to regulator approval, embrace FRMS for all or part of their operations.

The *purpose* of any FRMS is to ensure that flightcrew members are sufficiently alert so that they can operate to a satisfactory level of performance and safety under all circumstances.

A FRMS supplements prescribed flight and duty time regulations and other validated independent scientific research based software tools by applying safety management principles and processes to proactively and continuously manage fatigue risk through a partnership approach requiring shared responsibility among management and crew members. These changes to the prescriptive rules must be operationally validated prior to acceptance. It can therefore only operate in circumstances where all stakeholders, particularly the pilot body, support the operation of a FRMS. Accordingly, an open reporting system and non-punitive working environment, sometimes referred to as a "just culture" is a prerequisite within the organization for a FRMS to exist because crew feedback is an essential component of the program. All successful safety programs such as ASAP and FOQA are based on a three-way partnership and FRMS should be the same. A FRMS must specify the prescriptive regulatory scheme upon which it is based. In the event of suspension, termination or revocation of FRMS, the carrier's affected operations shall revert to the baseline prescriptive scheme.

FRMS is intended to be used to supplement prescriptive fatigue management regulations as a means of ensuring that flight crew remain sufficiently alert during duty to achieve a satisfactory level of operational performance and hence safety under all circumstances. A well developed and managed FRMS integrates operational and scientific data such as physiological and behavioral measures in the scheduling of crew members by providing a balance between duty types, crew rest and recovery. In the case of extended flight duty periods with augmented crew, such as ultra long range (ULR) operations, the planning of in-flight rest can be optimized.

FRMS must be based on a partnership approach for which there is agreement between the operator, regulator and pilot body. As FRMS is a new emerging concept, a Memorandum of Understanding between principle stakeholders should form the basis of initial agreement and be the subject to on-going periodic review based on assessment of the effectiveness of the program in achieving its stated goals. The Memorandum of Understanding must include a mechanism for the representatives of the stakeholding pilots to suspend or terminate participation in the operator's FRMS in the event that the representatives of the stakeholding pilots determine in their discretion that the FRMS program's safety *purpose* is not being met.

Pilot representatives, either from, where such a body exists, an established organization independent of the company, or where such a body does not exist, independently elected directly by the pilots, must be included as members of the operator's Fatigue Management Steering Group. This committee will be fully involved in the initial development of the FRMS program, and shall be fully and directly the on-going oversight of the operator's FRMS program including the development of modifications of the FRMS to meet the program's safety *purpose*.

# 117.9 Schedule Reliability

**The IPA proposes the following changes:**

> Schedule reliability – means the accuracy of the length of both a scheduled flight duty period and a **scheduled flight segment** as compared to the actual flight duty period **and segment**.

This change in definition to include measurement of “flight segments” is necessary for consistency with our proposed changes to 117.9.

> **§ 117.9(a)** Change 60 days to **30 days**
>
> **(a)(1)(*modified*)** Its system-wide flight duty periods if the total actual flight duty periods exceed the scheduled flight duty periods **by more than 15 minutes** more than 5 percent of the time**,** and
>
> **(a)(2)(*modified*)** Any scheduled flight **segment** that is shown to actually exceed the schedule 20 percent of the time.
>
> **(b)(*modified)*** Each certificate holder must submit a report detailing the scheduling reliability adjustments required in paragraph (a) of this section to the FAA every **30 days** detailing both overall schedule reliability and **flight segment reliability.** Submissions must consist of:

**(1)*(modified)* The carrier's entire FDP schedule for the previous 30 day period and separately those FDP's exceeding the scheduled FDP by 15 minutes.**

**(2)*(modified)* The carrier's flight segments on a per segment basis and the list of those segments exceeding the 20 percent requirement in (a)(2).**

These proposed amendments accomplish two changes to the proposed rule. First, the reporting period is 30 days rather than 60 days and second, a flight segment reliability requirement is added.

If a schedule exceeds the limits in this section the certificate holder should take prompt action to correct the schedule. A certificate holder should not be allowed to operate a schedule that violates the scheduling limitations for 60 days. With the sophisticated computerized scheduling programs available and used by most, if not all certificate holders, a 30 day reporting period is neither unreasonable nor burdensome. The certificate holder should correct any schedule exceedance at the point the certificate holder becomes aware that the schedule does not meet the scheduling limitations.

To achieve schedule reliability the individual flight segments must be considered. If a given segment within a FDP causes the FDP to exceed the limits, the certificate holder can merely leave the offending segment and change the pairing mix to hide the problem and/or bring it within limits. The problem segment would never be corrected. We believe that a scheduling metric must be included in 117.9. Certificate holders now provide on-time reports to the DOT on an individual flight segment so this should not be a burdensome requirement and we have incorporated the familiar 15 minute buffer metric for the FDP reporting criteria.

Finally, the reporting information should be available in a timely manner to all stakeholders and the public.

# 117.13 Flight Time Limitation

## IPA Proposes:

### I. New Definition of Flight Time

### II. Table A which specifies flight time limits be amended.

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The IPA proposes the following changes:

I. The definition of flight time in FAR 1.1 is currently defined as the moment the aircraft fist moves under its own power. However, the PIC and required flight deck crewmembers are always responsible and must perform their duties when the aircraft is moved by a tug or sits at a hardstand with the engines running, and that time should count as flight time if the movement is with the intention for flight. This definition is consistent with EU-OPS subpart Q, which provides:

> "*The **time** between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped*."

We propose the following definition for flight time:

> **Flight Time – means when the aircraft first moves with the intention of**
>
> **flight until it comes to rest on the designated parking position.**

II. We propose that Table A which specifies flight time limits be amended as follows:

**Table A—Maximum Flight Time (Block) Limits**

| Time of Report (Home Base or Acclimated Local Time) | Maximum Flight Time (hours) |
|---|---|
| 0000-0459 | 7 |
| 0500-0659 | 8 |
| 0700-1259 | 9 |
| 1300-1959 | 8 |
| 2000-2359 | 7 |

The IPA does not support an increase in flight time to the limits proposed by the FAA in the proposed rule Table A to Part 117-Maximum Flight Time Limits for Un-augmented Operations.

We do recommend that Table A be modified to reflect the unanimous view of the ARC that the limit be 7 hours for the early morning hours and the majority view that it be 7 hours for the late evening hours. Likewise, the majority view was that the maximum limit should be 9 hours for the period, which is a 12.5 percent increase when compared to the current rule. Even if certificate holders have to "buffer" schedules, they will be in no worse position than they are today because of the increased limits.

There are not any existing scientific studies that have scientifically evaluated or verified flight time and its impact on fatigue. However, there is applied fatigue science that indicates factors such as workload, time on task, noise, vibration, increased cabin altitude, pressure changes, low humidity and cosmic radiation are all factors related to fatigue but have not been evaluated in the context of flight time. Common sense would dictate that increased exposure to these factors could increase fatigue and negatively impact safety. Fatigue and loss of alertness associated with inactivity due to being confined to a seat in the cockpit and performing monitoring functions for longer time periods without rest have also not been evaluated. Additionally, the combination of immobility and relative dehydration are well known causes of deep vein thrombosis (also known as deep-vein thrombosis or deep venous thrombosis and usually abbreviated as DVT), which is sometimes cited as "air travel" or "economy class syndrome".[10] Until there are scientific studies on the physiological effects of pilots spending more time aloft and its impact on fatigue the IPA recommends not increasing

[10] Scurr JH, Machin SJ, Bailey-King S, Mackie IJ, McDonald S, Smith PD, *Frequency and Prevention of Symptomless Deep-Vein Thrombosis in Long-Haul Flights: A Randomised Trial*, 357 Lancet No. 9267, 1485–9. (May 2001).

the amount of flight time a flightcrew member can fly to the limits proposed by the NPRM.

The IPA also strongly believes the flight time limits must be “hard” and not “scheduled” for several reasons. Foremost, the most frequently abused provision of the current rules is the “scheduled flight limitation provision.” Certificate holders consistently schedule to the limit (i.e. 7:59) even when they know in advance that the flight on a given day will not meet the scheduled time because of winds or ATC delays at busy airports. In practice, many of these schedules exceed 8 hours by 45 minutes or more. In addition, we have observed some schedules that exceed the current block hour limits in excess of 80% of the time over several consecutive months.[11]

The hard limits would be applied similar to how “Whitlow” is currently applied with regards to the 16 hours duty limit. As the Agency and others will recall, in 2001 the certificate holders resisted Whitlow on the grounds that the cost would put certificate holders out of business. We anticipate the same approach to this NPRM. In their request to stay enforcement of Whitlow, the RAA stated that the Whitlow interpretation would “bring about the demise of smaller carriers.” They would be required to hire numerous flight crewmembers and the cost would mean elimination of service to smaller cities. Likewise, the ATA complained that enforcement of Whitlow would inconvenience the traveling public, as their members would have to delay and cancel flights. Additionally, the ATA carriers would be subjected to having to hire many additional flight crewmembers incurring tremendous costs for salaries, benefits and training.

For this reason they engaged in litigation to overturn Whitlow. When that effort failed, the certificate holders implemented the interpretation with little or no impact on their operation. They adjusted their scheduling practices with minimal or no cost. It can be anticipated that the certificate holders will take the same position on hard limits as they did with Whitlow. *The sky is falling* approach should be rejected. With the sophisticated scheduling programs and historical data available to certificate holders, the implementation of this provision should be accomplished at minimal cost.

Finally, under the current FAR 121.471 the regulation permits flight time to be exceeded provided compensatory rest would be provided. The proposed rule prescribes only a minimum rest period and does not take into account additional rest for exceeding flight time limits. If Table A were scheduled there would be no protection for fatigue caused by the exceedures, therefore, flight time limits should remain hard limits and not scheduled limits.

[11] Letter from Robert Thrush, IPA President, IPA, to Larry Ortkeise, FAA POI for UPS, FAA (June 1, 2010) (on file with the IPA)

# Flight Duty Period: Extensions
## 117.15(c)(1) and (c)(2) and 117.19(f)(1) and (f)(2)

## IPA Proposes:

I. **IPA supports 117.15(c)(1) and (c)(2) and 117.19(f)(1)*(modified)* and (f)(2) as proposed by the FAA**

II. **Change NPRM proposed extension to a scheduled flight duty period for augmented operations from a maximum of 3 hours to 2 hours.**

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The IPA supports part 117.15 as proposed by the FAA. We strongly support part (c)(1) and (c)(2) regarding FDP extensions. We applaud the FAA for proposing regulatory language that predicates FDP extensions on the scheduled FDP and not the maximum FDP permitted based upon the time the flight crewmember reported for duty. We believe the proposed unrestricted 30 minutes extension of a scheduled FDP is an acceptable amount of time to provide a carrier with operational flexibility.

We can also support an extension of a scheduled FDP up to 2 hours beyond the scheduled flight duty period not to exceed the charted maximum value (based upon the time the flight crewmember reported for duty) with joint agreement of the pilot in command and certificate holder.

Pilot in command agreement is essential as he is in the best position to determine whether or not the flightcrew could safely extend a FDP based on previous rest, previous duty and anticipated future duty. To eliminate the pilot in command from the decision making process strays from the concept of "fitness for duty" as he can best assess his fitness to extend a scheduled FDP. We believe 2 hours is a reasonable amount of time to provide a certificate holder with schedule flexibility due to unforeseen operational circumstances. The single occurrence beyond 30 minutes in 168 hours ensures there is not abuse of the extension provision and reinforces schedule reliability which is also predicated on scheduled flight duty periods. Finally, we further agree with the FAA that a decision to extend a FDP, "cannot be an arbitrary decision by either party, and safety of flight must be the primary consideration."[12]

FDP extensions are predicated on "unforeseen operational circumstances" beyond the carrier's control and are discussed in detail in the Preamble.[13] The ARC discussed the issue of unforeseen circumstances beyond the carrier's control in the context of extreme

[12] Response to Clarifying Questions 14 CFR parts 117 and 121 Flightcrew Member Duty and Rest Requirements; Proposed Rule Docket No. FAA-2009-1093 p.12

[13] Flightcrew Member Duty and Rest Requirements, 75 FR 55852, 55860 (proposed Sept. 14, 2010) (to be codified at 14 C.F.R. pt. 117 and 121).

weather events such as a blizzard in Newark that cripples the entire northeast or an unforecast March ice storm in Memphis. As further discussed in the Preamble, "Thus, while the FAA contemplates that adverse weather could fit within the criteria because it is beyond the control of the certificate holder, it would not always be considered unforeseeable. Carriers should anticipate thunderstorms in many parts of the United States during the summer months. Likewise, heavy snow in the northern parts of the country should be anticipated during the winter, and the jet stream follows basic seasonal patterns."[14] We do not believe circumstances based strictly on economic business consideration, inadequate staffing or poor schedule planning qualify as being beyond the control of the certificate holder.

We are concerned that some submitters may propose allowing an extension of a FDP beyond the maximum limits in Table B. Any extension to a scheduled FDP must take into account the amount of sleep a flightcrew member has had during the last rest period, as well as any accumulated sleep debt. For example, a flightcrew member could show at 1200 for a scheduled 8:00 hour FDP ending at 2000 expecting the following FDP to start the next day at 0700. Extending the FDP to the charted maximum of 13:00 (ending at 0100) is over a 60% increase from scheduled duty. Extending the FDP to the maximum plus two hours (15:00 hours ending at 0300) is almost a 90% increase from scheduled duty. If the flightcrew member awoke at 0600 prior to the start of the FDP (expecting to get off duty at 2000 the same evening), when getting off duty at 0300 he would have been awake for 21 hours. Science has drawn the correlation between time awake and blood alcohol content (BAC). Twenty-one hours awake closely mimics the mental acuity of a BAC of .08.[15] While some operations could be scheduled with a longer FDP, prospective rest opportunities must be taken into account, not future make-up rest opportunities.[16] Additionally consideration must be given to other factors such as number of legs, time of day, previous flight duty periods and environmental factors as the interactions between multiple fatigue-related factors contribute to fatigue buildup.

We also apply the same rationale to FDP extensions to 117.19 Flight Duty Period: Augmented flightcrew. As currently proposed the rule does not provide greater rest opportunities for augmented operations, as well as the consensus opinion that rest during flight cannot be guaranteed. Therefore, the 2-hour extension should remain the same for augmented operations.

We propose the following amendment to 117.19:

**117.19(f)(1)(*modified)*** The pilot in command and certificate holder may extend a flight duty period **beyond the scheduled flight duty period** up to ~~3~~ **2** hours.

[14] Id.
[15] Drew Dawson and Kathryn Reid. *Fatigue, Alcohol and Performance Impairment*, 388 Nature 235 (1997).
[16] *An Overview of the Scientific Literature Concerning Fatigue, Sleep, and the Circadian Cycle* (Battelle Memorial Institute, Frederick Md.) January 1998 at 13

# Acclimation

## IPA Proposes:

**I. Definition of Acclimated**
**II. Definition of Acclimated Local Time**
**III. Definition of Unacclimated**
**IV. Definition of Theater**

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The IPA proposes the following changes:

I. **Acclimated: means a condition in which a crewmember has been in a new theater for the first 72 hours since arriving and has been given at least 36 consecutive hours free from duty during the 72 hour period.**

The established science, as we demonstrate below, is that at least three consecutive local nights rest is required to become acclimated. CAP 371 recognizes this science and requires three consecutive local nights rest to be acclimated.

As the proposed rule is currently written, it would allow carriers to provide 36 hours of uninterrupted rest at the layover location and then be considered "acclimated" to the local time zone. Such an assumption is incorrect for the following reasons:

1. For typical flights from the US to Europe or Pacific destinations, the number of time zones crews would transit would be in excess of 5 or more. The general agreed upon acclimation rate is about 1 time zone or one-hour difference per day.[17] Some expert researchers have published data showing even longer periods to become acclimated to the local time zone.[18] Conclusion: The crew would not be acclimated after 36 hours of layover rest.

[17] *A Review of Issues Concerning Duty Period Limitations, Flight Time Limitations, and Rest Requirements* (Battelle Memorial Institute). (1998). Federal Aviation Administration (AAR-100). Washington, D.C.

[18] Gander et al. (1989) showed that it took several days for the acrophase of the temperature rhythm to come within one standard error of complete resynchronization after a 9 hour westward transition, and that the adaptation in an eastward direction took even longer. This differing rate of adaptation related to direction of travel is shown in table 1 (after Klein and Wegmann, 1979). PH Gander, G. Myhre, RC Graeber, HT Andersen and JK

2. While three consecutive physiological nights may start approaching a reasonable compromise for the purpose of entering the FDP tables, a 36-hour rest clearly would not. In order for the rules to approach parity, the implication is that a night of normal sleep would be approximately 8-9 hours of sleep. Three nights of consecutive sleep would be 24-27 hours of sleep. The 36-hour rule suggests that crews would remain asleep for nearly the entire layover period. This is not physiologically plausible for healthy aircrews.

3. Further, it is critical for any fatigue safety regulation to assess where a flightcrew member is in their own circadian cycle – as that will determine when in the following rest periods they will be able and likely to sleep from a physiological perspective. To be sure, being put into a rest cycle does not mean that the crew will be able to sleep according to a desired clock position. The Crews' circadian phase will be the key-determining factor as to when and how long crews will subsequently sleep. In a 36 hour rest situation, crews could have only one full sleep cycle in their physiological nadir and if that falls early in the layover rest period, they would initially sleep, then be awake for an extended period before reporting for duty. At that point, the pilot, through no fault of their own, would be significantly fatigued after being awake for 12 or 15 hours prior to start their duty period.

While everyone expects crews to be professional and report fit and rested for their flying duties, it would unfair if they rested when they were physiologically and predictably tired and then awake when they physiologically were unable to easily sleep and subsequently had to report to duty more fatigued then when they started.

The IPA believes that the regulation should require 3 local nights rest. However, 72 hours in theater in conjunction with a 36 hour rest within the 72 hours may allow a flight crewmember to become acclimated. Merely being in theater for a 72-hour period without at least a 36 consecutive hours rest during that time would not allow a person to become acclimated. It is necessary to have both time in theater and adequate rest to become acclimated.

The preamble to the proposed regulation states that the tables selected from the ARC were in part based on being the most conservative approach. Given the wide range of available research on the topic of acclimation combined with the operational consequences of not taking a correct approach clearly points to selecting a more conservative approach. We believe 72 hours in theater comprising 36 hours free of duty as the compromise position in determining if a crew is acclimated for the purposed of determining the length of the subsequent FDP.

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Lauber, *Sleep/Wakefulness Management in Continuous/ Sustained Operations,* 61 Aviation Space Envtl. Med. (1989) 733-743.

**II. Acclimated Local Time - means the local time at the location where the flightcrew member last had greater than 36 hours free from duty in the first 72 hours in theater.**

This definition provides an unambiguous time for applying the definition of Nighttime Duty Period and for entering the FDP and Flight Time limit tables. The original NPRM wording of “acclimated or home base” time left many questions of interpretation. Similarly, the exact location of acclimation must be known to determine future loss of acclimation. For example, a pilot flies to Paris and has 37 hours off, but at the end of his 72 hours in theater happens to be 3 more hours east at Tel Aviv. He is now acclimated, but where? Would a further flight two more hours east to Dubai cause him to be unacclimated? It depends whether you define the point of acclimation as being tied to the 36-hour rest or to the 72 hours in theater condition. The above-proposed definition removes such doubts about the location of acclimation and the use of regulation tables, allowing reliable computer programming of scheduling. Both the tables and the definition of Nighttime Duty Period should then use the new term, “Acclimated Local Time”.

**III. Unacclimated – A flightcrew member becomes unacclimated if he has traveled to a location more than 4 times zones or more than 60 degrees of longitude from the location at which he was last acclimated.**

The NPRM references “unacclimated” in several sections of the proposed regulation but does not define the term. We believe it should be defined. Defining acclimation in terms of “time zones” is subject to whim of governmental policy, (e.g., all of China is in a single time zone even though it spans 5 normal time zones in width) 60 degrees of longitude is equivalent to 4 normal time zones and should be included as an alternative to the time zone metric.

**IV. Theater *(amended)***: means a geographical area where local time at the crewmember’s flight duty period departure point and arrival point differ by no more than 4 **time zones, or 60 degrees of longitude.**

# 117.19 Flight Duty Period: Augmented Flightcrew

**The IPA proposes the following changes:**

**Revised Table C—Flight Duty Period: Acclimated Augmented Flightcrew**

| Time of Start (Home Base or Acclimated Local Time ) | Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots | | | | | |
|---|---|---|---|---|---|---|
| | Class 1 Rest Facility | | Class 2 Rest Facility | | Class 3 Rest Facility | |
| | 3 Pilots | 4 Pilots | 3 Pilots | 4 Pilots | 3 Pilots | 4 Pilots |
| 0000-0559 | 13:50 | 16:05 | 12:55 | 14:20 | 11:45 | N/A |
| 0600-0659 | 15:10 | 17:40 | 14:10 | 15:40 | 12:55 | N/A |
| 0700-1259 | 16:00 | 18:00 | 15:25 | 17:05 | 14 | N/A |
| 1300-1659 | 15:10 | 17:40 | 14:10 | 15:40 | 12:50 | N/A |
| 1700-2359 | 13:50 | 16:05 | 12:55 | 14:20 | 11:45 | N/A |

**Revised Table D—Flight Duty Period: Nonacclimated Augmented Flightcrew**

| Time of Start (Home Base or Acclimated Local Time) | Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots | | | | | |
|---|---|---|---|---|---|---|
| | Class 1 Rest Facility | | Class 2 Rest Facility | | Class 3 Rest Facility | |
| | 3 Pilot | 4 Pilot | 3 Pilot | 4 Pilot | 3 Pilot | 4 Pilot |
| 0000-0559 | 13:15 | 15:20 | 12:20 | 13:35 | 11:15 | N/A |
| 0600-0659 | 14:30 | 17 | 13:35 | 15 | 12:15 | N/A |
| 0700-1259 | 15:50 | 18:00 | 14:50 | 16:25 | 13:30 | N/A |
| 1300-1659 | 14:30 | 17 | 13:35 | 15 | 12:20 | N/A |
| 1700-2359 | 13:15 | 15:20 | 12:20 | 13:35 | 11:15 | N/A |

Amend 117.19 (c)(1) to read:

**117.19(c)(1)*(amended)*** **The final segment provides a minimum of 2 consecutive hours available for in-flight rest for both flightcrew members occupying a control seat during landing. (This would require a minimum segment length of 6 hours for a 3 pilot crew and 3:45 for a 4 pilot crew to achieve the required rest.)**

117.19(c)(3) deleted

**117.19(d)(*modified*)** No certificate holder may assign and no flightcrew member may accept an assignment involving more than ~~three~~ **two** flight segments under this section unless the certificate holder has an approved fatigue risk management system under §117.7

**117.19(f)(1)(*modified)*** The pilot in command and certificate holder may extend a flight duty period **beyond the scheduled flight duty period** up to ~~3~~ **2** hours.

**117.19(f)(2)(*modified*)** An extension in the **scheduled** flight duty period exceeding 30 minutes may occur only once in any 168 consecutive hour period.

***As an administrative matter, we have pointed out in our clarifying questions on the docket that Table C as published in the NPRM has an incorrect heading. The table heading needs to match Table B and the "Time of Start" should include home base or acclimated local time.**

The NPRM proposed chart in Table C is based on the TNO Report. Upon a further review of the TNO Report, we believe the proposed Table C was oversimplified in two regards. The first was that many of the values were oversimplified following a rounding process that does not adequately represent the actual calculations used in the ARC process. The second oversimplification is the use of a standard 30-minute reduction for a nonacclimated crewmember. The end result is an improper application of a nonacclimated penalty for the operation planned. Additionally, just as is the case with the acclimated discussion, a table that reflects the true values is better suited to accurately reflect the appropriate reduction for the crewmember not being acclimated. In today's world with the prevalence of electronic interaction with schedules, there is little need to round values to a whole or half hour.

Additionally, the TNO Report was intended for single segment operation only and the addition of more than one additional segment would stray too far from the science on which the charts were developed. Multi-leg augmentation should only be allowed when no crew change is possible. Multi-leg augmentation should never be used solely for the purpose of extending a flight duty period. Augmented flights must not be mixed with non-augmented flights in the same flight duty period.

The proposed regulation 117.19 (c)(3) provides for a 2-hour consecutive sleep opportunity for the flight crewmember manipulating the controls on landing. That sleep opportunity should be mandated for both required crewmembers during approach and landing. Both crewmembers manipulate the controls, i.e., the pilot monitoring normally operates flaps, landing gear, and radios and performs monitoring so he must be equally alert. Much emphasis has been placed on the concept of crew resource management (CRM) and pilot monitoring duties.[19] Also, there are circumstances such as Category III approaches where the pilot monitoring might actually be the pilot landing. To deprive any of the operating flightcrew members an in-flight rest opportunity would not help

[19] Robert Sumwalt, Ronald Thomas and Key Dismukes, *Enhancing Flightcrew Monitoring Skills Can Increase Flight Safety,* 55th Air Safety Seminar, (Nov. 2002).

mitigate fatigue. This is especially important as augmentation has the potential to significantly increase time on task. The final segment of any augmented flight must provide the required rest. During the most challenging approaches, such as Category III approaches, both crewmembers are manipulating the controls. On short final, the manipulation of the flight controls transfers from one pilot to the other at approximately 300 feet, which illustrates why it is essential for both pilots to receive adequate rest to be prepared for landing. There are also other high workload circumstances where both pilots are manipulating the controls such as when a landing must be rejected or decision-making is required for diversion.

As currently proposed the rule does not provide greater rest opportunities for augmented operations, therefore, the 2-hour extension should remain the same for augmented operations, not be increased to 3-hours as proposed under 117.19. We also provide the same rationale to section (f) as the same stated previously in the IPA comments on 117.15(c) and is equally applicable here.

The IPA recommends that four-pilot augmentation should not be permitted with an inferior rest facility. Placing more pilots on board under these circumstances when obtaining rest is marginal just increases the likelihood that you will have more fatigued pilots. FDPs of a length that mandate four pilots should be limited to Class 2 facilities or better.

Finally, the IPA recommends the following provision be incorporated into section 117.19:

> **Any FDP that includes total flight time in excess of 12 hours shall require a minimum of a Class 1 rest facility aboard the aircraft.**

From AC 120-100 Basics of Aviation Fatigue, “The ULR Crew Alertness workshops of the FAA’s 2008 Fatigue Symposium showed that ensuring adequate bunk sleep is one of the most important in-flight countermeasures to use to address sleep loss and circadian disruption during extended aviation operations[20].”

[20] Flight Safety Foundation, *Lessons from the Dawn of Ultra-Long-Range Flight*, Flight Safety Dig., Aug-Sept, 2005, 1-60.

# 117.21 Reserve Status

**The IPA proposes the following changes:**

Due to overly complex language, we propose to rewrite section **117.21(c)** as follows:

(c) For short call reserve,

(1) **The maximum reserve duty period for un-augmented operations is defined as:**

**Table E—Short Call Reserve Duty Period**

| Time of Start of RAP (Home Base or Acclimated Local Time) | Maximum Flight Reserve Duty Period (hours) Based on Number of Flight Segments | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7+ |
| 0000-0359 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 0400-0459 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 0500-0559 | 15 | 15 | 15 | 15 | 14 | 13.5 | 13 |
| 0600-0659 | 16 | 16 | 16 | 16 | 15 | 15 | 14.5 |
| 0700-1259 | 16 | 16 | 16 | 16 | 16 | 16 | 15 |
| 1300-1659 | 16 | 16 | 16 | 16 | 15.5 | 15 | 14.5 |
| 1700-2159 | 15 | 15 | 14 | 14 | 13.5 | 13 | 13 |
| 2200-2259 | 14.5 | 14.5 | 13.5 | 13.5 | 13 | 13 | 13 |
| 2300-2359 | 13.5 | 13.5 | 13 | 13 | 13 | 13 | 13 |

(2) **All time within the reserve availability period is duty**.

(3) **The maximum reserve duty period (to include phone availability and/or flight duty period assignments) is determined by the earlier end point of**
**(a) the start of the RAP time plus value in Table E or**
**(b) the Flight Duty Period limitation in Table B as measured from the FDP time of start (home base or acclimated local time).**

**Note: For example: If the RAP started at 0100, crewmember called at 0115, show at 0300, then it would be the EARLIER FDP end time of:**

**(i) RAP start 0100 + 13 hours = 1400 FDP end**

**(ii) RAP start 0100 + 1307 hours (+ 7 minute WOCL adjustment) = 1407 FDP end**

**(iii) FDP start at 0300 + 9 hours FDP limit = 1200 FDP end**

This ensures that the reserve will NOT have an allowable FDP limit greater than the lineholder the reserve is paired with and does not impact the operator in any manner since the reserve and lineholder end point is the same.

(4) **If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the air carrier may increase the maximum reserve duty period in Table E by one-half of the length of the time during the reserve availability period of 0000-0600 in which the air carrier did not contact the flightcrew member, not to exceed 3 hours; however, the maximum reserve duty period may not exceed 16 hours. If the flightcrew member is contacted for an assignment prior to 0000 hours the reserve duty period would not be extended.**

**Note: For example, RAP starts at 2200 hours, pilot called at 0300 for flight assignment, the RAP may be extended by 1.5 hours. If the pilot was called prior to 0000 hours there would be no extension.**

The short call reserve section is complex and we are concerned that there will be misunderstanding by flight crewmembers, schedulers and management officials with the section as written. Consistent with other limitations in the proposal, we believe a chart is a better way to set forth the short call reserve limits expressed in the proposal. We urge that the chart that sets forth the short call reserve limits be adopted. In both the ARC and the NPRM preamble, the intent was expressed that RAP extension credit is to be made available for not contacting reserves between 0000 and 0600 whose RAPs touch that time period. However, the proposed language in 117.21(c)(4) (iv) and 117.21(c)(5)(iii) neglects this distinction, providing credit for *any* period of non-contact. This error in the language has been corrected in our revised language above. Note also our concern that a certificate holder should not be able to contact a flightcrew member at 2300 and require them to show for duty at 0400 and still attempt to take credit for allowing the flightcrew member to sleep during 0000-0600. This example would require the flightcrew member to awaken hours before 0400, thus negating any benefit of extending the maximum reserve duty period.

**(5) No certificate holder may schedule and no reserve flightcrew member on short call reserve may accept an assignment of a flight duty period that begins before the flightcrew member's next reserve availability period unless the flightcrew member is given at least 14 hours rest. This provision may be used only once in a rolling 168 hour period.**

The need for this provision is best illustrated by real world examples. A pilot is scheduled and adjusts his rest schedule for a series of RAPs beginning at 0400. If the operator contacts the pilot at 0600 (after the morning bank of departures) and releases the pilot for a 14-hour rest period, the pilot could then begin a RAP at 2000 to cover the late evening bank of departures. The pilot could then be contacted at 2200 and released for another 14-hour rest period. This cycle could continue for an indefinite period. Our proposal aligns this section with the provision for shifting of a RAP in section (e). Without this provision there is essentially no difference between a short-call and long-call reserve removing all circadian protection afforded by having a RAP system in the first place.

# 117.25 Rest Period

## IPA Proposes:

### I. No Reduction in Minimum Rest Period

### II. Minimum Rest Period of 10 hours or 12 Hours Unacclimated in a New Theater

### III. Recovery Rest Return to Home Base

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The IPA proposes the following changes:

(c) ***(deleted)*** ~~No certificate holder may reduce a rest period more than once in any 168 consecutive hour period.~~

(d) No certificate holder may schedule and no flightcrew member may accept an assignment for reserve or a flight duty period unless the flightcrew member is given a rest period of at least ~~9~~ **10** consecutive hours before beginning the reserve or flight duty period measured from the time the flightcrew member reaches the hotel or other suitable accommodation.

According the FAA's own Fitness for Duty Advisory Circular, AC120-FIT: "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 nine or even eight hours of sleep by the crewmember. The reality is that a 9-hour rest period may yield seven 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." We believe that a 10-hour rest period starting at the rest facility is the minimum period of time that will allow the scientifically mandated eight hours of sleep.[21]

[21] Battelle, *supra* note 16 at 18.

**(d)(1) (*added*) An unacclimated flightcrew member shall be given at least 12 consecutive hours of rest beginning upon arrival at the rest facility before beginning a RAP or flight duty period.**

(e) ***(deleted)*** ~~In the event of unforeseen circumstances, the pilot in command and certificate holder may reduce the 9 consecutive hour rest period in paragraph (d) of this section to 8 consecutive hours.~~

Reduced rest should never be permitted. The science supporting reduced rest assumes a full sleep bank.[22] It strikes us that assuming a full sleep bank at any point in any FDP is a risky proposition. As a reduced rest period would in all likelihood follow an extended FDP, it makes even less sense to consider reducing rest. We feel that the best policy is to consistently take the conservative route, especially when one considers the variations in report time, daytime sleep, and the whole host of other factors that flightcrew members must deal with. Should the FAA persist in allowing reduced rest it is critical that this is not permitted in conjunction with an extension of a flight duty period beyond the maximums in Table B.

**(f) (*added*) No certificate holder may schedule and no flightcrew member may accept an assignment for reserve or a flight duty period after completion of any duty period(s) (flight or reserve) in a new theater unless the flightcrew member is given a rest period upon return to the flightcrew member's home base location in accordance Table F.**

**(f)(1) *(added)* The recovery rest in Table F satisfies the requirements for acclimation and the flightcrew member would then enter Table B without a penalty.**

[22] Id. at 18.

**Table F – Number of Local Nights for Recovery on Return to Home Base**

| Elapsed Time Since Leaving Home base (h) | Maximum Time Difference from Home Base (h) | | | | | |
|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8-9 | 10-12+ |
| 60-84h | 1* | 2* | 2* | 2* | 2* | 3 |
| 84-108h | 2* | 2* | 3 | 3 | 3 | 3 |
| 108-132h | 3 | 3 | 3 | 3 | 3 | 3 |
| 132-156h | 3 | 3 | 3 | 3 | 3 | 3 |
| 156+h | 3 | 3 | 3 | 3 | 3 | 3 |

**Note 1: The values in Table F refer to eastward transitions (eastward outbound/ westward homebound) only. * denotes that for westward transitions (westward outbound/eastward homebound) one extra day is required to be added to the value depicted.**

**Note 2: When the elapsed time away from home base is less than 60 hours one full local night's recovery rest should be provided on return to base, except when the returning flight duty period encroaches the WOCL, then an additional local nights rest will be added**

A flight from the U.S. to Europe or Asia disrupts the circadian cycle and a rest of 10 hours is not sufficient to achieve an appropriate level of alertness. Thus, when flight crewmembers fly to a new theater they should be given at least 12 hours at a suitable accommodation until acclimated.

We also believe that there should be recovery rest for time away from home operating flights in a different theater that is less than 168 hours. The current regulations provide for recovery rest in international operations for operations less than a 168 consecutive hours period. (See: 121.483, 485; 121.523, 525)

We believe that this recovery rest is necessary to address cumulative fatigue, to provide circadian restabilization and to repay accumulated sleep debt. We therefore propose the above recovery rest chart be incorporated into the final rule.

# 117.27 Consecutive Nighttime Operations

## IPA Proposes:

### I. New Definition of Nighttime Flight Duty and Consecutive Night Duty Period

### II. 4th Night of Consecutive Nighttime Operations

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The IPA proposes the following changes:

**I.** We agree with science and from professional experience that a flight duty period encompassing the hours of 0200 and 0600 is challenging, as fatigue is more likely. A majority of our flight operations begin in the early evening and end the following morning. The FAA's Response to Clarifying Questions document defined "nighttime operations" as those that commence between 2200 and 0500. Under this definition a FDP could begin at 2100 and conclude at 0600 and that would not satisfy the FAA's definition of nighttime operations even though the flight duty period required the pilot to be awake all night. The definition of nighttime flight duty is important because the current proposal limits consecutive nighttime flight duty periods to three.

Fatigue during nighttime operations is a result of the pilot being prevented from sleeping during his normal sleep period and a function of circadian rhythms. Simply put, the pilot is forcing himself to stay awake when his body is telling him to sleep. After a period of approximately three consecutive nights of nighttime work performance decreases as a result of sleep debt. The only way to replenish the "sleep bank" is with an adequate sleep opportunity.

We believe it is necessary to re-define ***Nighttime Flight Duty*** to encompass operations operating through the WOCL. Also, to avoid confusion in applying 117.27 ***Consecutive Night Duty Period*** must be defined.

We propose the following definitions that are based on the CAP 371 definitions, which we believe is most appropriate:

**Nighttime Flight Duty – means a duty period during which any part of the duty period falls within the home base or acclimated local time period of 0200 to 0459.**

**Consecutive Night Duty Period - means two or more nighttime flight duty periods that are not separated by at least a Part 117.25 rest between the duty periods that encompasses a physiological night's sleep (0100 to 0700) at home base or acclimated local time.**

**II.** We agree with the FAA that there should be a limit placed on consecutive nighttime flight duty periods. Nighttime operations should be limited to three nights unless some type of strategy to mitigate fatigue is prospectively available to the flightcrew member. Science supports the fact that flight operations that impinge on the WOCL contribute to circadian fatigue and transient fatigue. Also, because daytime sleep is less restorative than nighttime sleep an individual accrues cumulative sleep deprivation, which has a profound impact on fatigue. We strongly disagree with any claim that a flightcrew member can simply "train" themselves to sleep during the day, thus negating all known science regarding the human body's need to sleep during the WOCL.

In the Preamble of the NPRM the FAA acknowledges there may be adverse safety impacts by limiting nighttime operations to three consecutive nights. Unintended consequences of limiting nighttime operations to three consecutive nights increases the number of first night operations, which many pilots agree is the most difficult because they aren't accustomed to being awake all night on the first night. The IPA agrees with this assessment.

The solution proposed by the FAA to allow more than three consecutive nighttime flight duty periods does not accommodate current flight operations at UPS. The opportunity to rest during the flight duty period in accordance with 117.7 is a minimum of 4 hours, measured from the time the flightcrew member reaches the rest facility. While the IPA can support mitigating fatigue by providing a rest opportunity, in reality there are very few of our flight operations that would meet these requirements.

Science acknowledges that adequate sleep is required to sustain performance. Additionally, if a sleep debt is accrued the only way to eliminate the sleep debt is with recovery sleep. By providing pilots an opportunity to maximize the amount of sleep obtained through an extended sleep opportunity the accumulation of significant chronic sleep debt may be avoided. We believe this strategy can be employed to permit a fourth consecutive nighttime flight duty period so long as the flightcrew member receives a minimum of 12 hours of rest following each flight duty period.

We propose the following amendment:

117.27 Consecutive nighttime operations ***(amended)***:

No certificate holder may schedule and no flight crew member may accept more than three consecutive nighttime flight duty periods unless the certificate holder provides an opportunity to rest during the flight duty period in accordance with § 117.17.

**A fourth consecutive nighttime flight duty period may be assigned if the flight crewmember receives a minimum of 12 hours rest following each nighttime flight duty period.**

# 24-Hour Layovers

While the IPA is supportive of the vast improvements in the current proposal we remain concerned that 24-hour layovers and their disruption on sleep and circadian rhythms was not addressed at all in the NPRM. This issue was discussed at length during the ARC process and several different concepts to limit or restrict 24-hour layovers were presented.

Professional pilots overwhelmingly agree that a 24-hour layover presents many challenges for a flightcrew member. The difficulty with 24-hour layovers is that the crewmember has to get two sleep opportunities in one off duty period. Many pilots will confirm that it is almost impossible to get one full sleep cycle, let alone two in a 24-hour period. The result is a circadian shift of the pilot's "body clock" resulting in a sleep deficit. This is especially true when flying internationally and an individual may not be predisposed to sleep based on his circadian rhythms. The result of a lost sleep opportunity is that through no fault of his own the pilot would be significantly fatigued prior to starting his duty period.

Further compounding this sleep debt are multiple 24-hour layovers on consecutive days. This results in a cumulative sleep debt and increased fatigue. The length of the duty period is irrelevant because the issue with 24-hour layovers is specific to the amount of rest an individual can obtain in the 24-hour off duty period. It is physically impossible to obtain two full sleep cycles in a 24-hour period. The IPA suggests limiting flightcrew members to no more than two scheduled layovers between 18-30 hours in a rolling 168 hours to prevent accumulated sleep debt. The IPA urges the FAA to revisit the issue of 24-hour layovers when drafting the final rule.

# Summary of proposed regulatory changes and amendments

## 117.3 Definitions

**Acclimated** – means a condition in which a flightcrew member has been in a new theater for the first 72 hours since arriving **and** has been given at least 36 consecutive hours free from duty during the 72 hour period.

**Acclimated Local Time - means the local time at the location where the flightcrew member last had greater than 36 hours free from duty in the first 72 hours in theater.**

**Consecutive Night Duty Period - means two or more nighttime flight duty periods that are not separated by at least a Part 117.25 rest between the duty periods that encompasses a physiological night's sleep (0100 to 0700) at home base or acclimated local time.**

**Flight Time – means when the aircraft first moves with the intention of flight until it comes to rest on the designated parking position.**

**Nighttime Flight Duty – means a duty period during which any part of the duty period falls within the home base or acclimated local time period of 0200 to 0459.**

Schedule reliability – means the accuracy of the length of both a scheduled flight duty period and a **scheduled flight segment** as compared to the actual flight duty period **and segment**.

**Theater - means a geographical area where local time at the crewmember's flight duty period departure point and arrival point differ by no more than 4 time zones or 60 degrees of longitude.**

**Unacclimated – A flightcrew member becomes unacclimated if he has traveled to a location more than 4 times zones or more than 60 degrees of longitude from the location at which he was last acclimated.**

## 117.7 Fatigue Risk Management System (FRMS)

Section 117.7(b) needs to be amended to include the following items:

- **The FRMS must be an equal partnership that includes the FAA, the certificate holder and non-management pilot representative.**
- **FRMS does not replace the regulatory scheme, its purpose is to supplement adequate prescriptive rules.**
- **Any FRMS must provide an equivalent or better level of safety and be centrally approved by the FAA. (One office at FAA headquarters should be responsible for approving FRMS. This is the only way to provide a uniform FRMS approval scheme.)**
- **FRMS should be limited to specific certificate holders' data and scheduled city pairs, which must be scientifically and then operationally validated by all stakeholders.**
- **FRMS, like SMS, requires a commitment from the certificate holder's senior management team and a specified line of accountability in the organization.**

## 117.9 Schedule Reliability

**§ 117.9(a)** Change 60 days to **30 days**

**(a)(1)(*modified*)** Its system-wide flight duty periods if the total actual flight duty periods exceed the scheduled flight duty periods **by more than 15 minutes** more than 5 percent of the time**,** and

**(a)(2)(*modified*)** Any scheduled flight **segment** that is shown to actually exceed the schedule 20 percent of the time.

**(b)(*modified)*** Each certificate holder must submit a report detailing the scheduling reliability adjustments required in paragraph (a) of this section to the FAA every **30 days** detailing both overall schedule reliability and **flight segment reliability.** Submissions must consist of:

**(1)*(modified)* The carrier's entire FDP schedule for the previous 30 day period and separately those FDP's exceeding the scheduled FDP by 15 minutes.**

**(2)*(modified)* The carrier's flight segments on a per segment basis and the list of those segments exceeding the 20 percent requirement in (a)(2).**

## 117.13 Flight Time Limitation

**Table A—Maximum Flight Time (Block) Limits**

| Time of Report (Home Base or Acclimated Local Time) | Maximum Flight Time (hours) |
|---|---|
| 0000-0459 | 7 |
| 0500-0659 | 8 |
| 0700-1259 | 9 |
| 1300-1959 | 8 |
| 2000-2359 | 7 |

## 117.19 Flight duty period: Augmented flightcrew

**Revised Table C—Flight Duty Period: Acclimated Augmented Flightcrew**

| Time of Start (Home Base or Acclimated Local Time ) | Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots | | | | | |
|---|---|---|---|---|---|---|
| | Class 1 Rest Facility | | Class 2 Rest Facility | | Class 3 Rest Facility | |
| | 3 Pilots | 4 Pilots | 3 Pilots | 4 Pilots | 3 Pilots | 4 Pilots |
| 0000-0559 | 13:50 | 16:05 | 12:55 | 14:20 | 11:45 | N/A |
| 0600-0659 | 15:10 | 17:40 | 14:10 | 15:40 | 12:55 | N/A |
| 0700-1259 | 16:00 | 18:00 | 15:25 | 17:05 | 14 | N/A |
| 1300-1659 | 15:10 | 17:40 | 14:10 | 15:40 | 12:50 | N/A |
| 1700-2359 | 13:50 | 16:05 | 12:55 | 14:20 | 11:45 | N/A |

**Revised Table D—Flight Duty Period: Nonacclimated Augmented Flightcrew**

| Time of Start (Home Base or Acclimated Local Time) | Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots | | | | | |
|---|---|---|---|---|---|---|
| | Class 1 Rest Facility | | Class 2 Rest Facility | | Class 3 Rest Facility | |
| | 3 Pilot | 4 Pilot | 3 Pilot | 4 Pilot | 3 Pilot | 4 Pilot |
| 0000-0559 | 13:15 | 15:20 | 12:20 | 13:35 | 11:15 | N/A |
| 0600-0659 | 14:30 | 17 | 13:35 | 15 | 12:15 | N/A |
| 0700-1259 | 15:50 | 18:00 | 14:50 | 16:25 | 13:30 | N/A |
| 1300-1659 | 14:30 | 17 | 13:35 | 15 | 12:20 | N/A |
| 1700-2359 | 13:15 | 15:20 | 12:20 | 13:35 | 11:15 | N/A |

Amend (c)(1) to read:

**§ 117.19(c)(1)*(amended)*** **The final segment provides a minimum of 2 consecutive hours available for in-flight rest for both flightcrew members occupying a control seat during landing. (This would require a minimum segment length of 6 hours for a 3 pilot crew and 3:45 for a 4 pilot crew to achieve the required rest.)**

§ 117.19(c)(3) deleted

**§ 117.19(d)(*modified*)** No certificate holder may assign and no flightcrew member may accept an assignment involving more than ~~three~~ **two** flight segments under this section unless the certificate holder has an approved fatigue risk management system under §117.7

**§ 117.19(f)(1)(*modified)*** The pilot in command and certificate holder may extend a flight duty period **beyond the scheduled flight duty period** up to ~~3~~ **2** hours.

**§ 117.19(f)(2)(*modified*)** An extension in the **scheduled** flight duty period exceeding 30 minutes may occur only once in any 168 consecutive hour period.

****Any FDP that includes total flight time in excess of 12 hours shall require a minimum of a Class 1 rest facility aboard the aircraft.**

***As an administrative matter, we have pointed out in our clarifying questions on the docket that Table C as published in the NPRM has an incorrect heading. The table heading needs to match Table B and the "Time of Start" should include home base or acclimated local time.**

## 117.21 Reserve Status

Due to overly complex language, we propose to rewrite section **117.21(c)** as follows:

(c) For short call reserve,

(1) **The maximum reserve duty period for un-augmented operations is defined as:**

**Table E—Short Call Reserve Duty Period**

| Time of Start of RAP (Home Base or Acclimated Local Time) | Maximum Flight Reserve Duty Period (hours) Based on Number of Flight Segments | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7+ |
| 0000-0359 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 0400-0459 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 0500-0559 | 15 | 15 | 15 | 15 | 14 | 13.5 | 13 |
| 0600-0659 | 16 | 16 | 16 | 16 | 15 | 15 | 14.5 |
| 0700-1259 | 16 | 16 | 16 | 16 | 16 | 16 | 15 |
| 1300-1659 | 16 | 16 | 16 | 16 | 15.5 | 15 | 14.5 |
| 1700-2159 | 15 | 15 | 14 | 14 | 13.5 | 13 | 13 |
| 2200-2259 | 14.5 | 14.5 | 13.5 | 13.5 | 13 | 13 | 13 |
| 2300-2359 | 13.5 | 13.5 | 13 | 13 | 13 | 13 | 13 |

(2) **All time within the reserve availability period is duty**.

(3) **The maximum reserve duty period (to include phone availability and/or flight duty period assignments) is determined by the earlier end point of**
**(a) the start of the RAP time plus value in Table E or**
**(b) the Flight Duty Period limitation in Table B as measured from the FDP time of start (home base or acclimated local time).**

**Note: For example: If the RAP started at 0100, crewmember called at 0115, show at 0300, then it would be the EARLIER FDP end time of:**

**(i) RAP start 0100 + 13 hours = 1400 FDP end**

**(ii) RAP start 0100 + 1307 hours (+ 7 minute WOCL adjustment) = 1407 FDP end**

**(iii) FDP start at 0300 + 9 hours FDP limit = 1200 FDP end**

(4) **If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the air carrier may increase the maximum reserve duty period in Table E by one-half of the length of the time during the reserve availability period of 0000-0600 in which the air carrier did not contact the flightcrew member, not to exceed 3 hours; however, the maximum reserve duty period may not exceed 16 hours. If the flightcrew member is contacted for an assignment prior to 0000 hours the reserve duty period would not be extended.**

**Note: For example, RAP starts at 2200 hours, pilot called at 0300 for flight assignment, the RAP may be extended by 1.5 hours. If the pilot was called prior to 0000 hours there would be no extension.**

**(5) No certificate holder may schedule and no reserve flightcrew member on short call reserve may accept an assignment of a flight duty period that begins before the flightcrew member's next reserve availability period unless the flightcrew member is given at least 14 hours rest. This provision may be used only once in a rolling 168 hour period.**

## 117.25 Rest Period

(c) ***(deleted)*** ~~No certificate holder may reduce a rest period more than once in any 168 consecutive hour period.~~

(d) No certificate holder may schedule and no flightcrew member may accept an assignment for reserve or a flight duty period unless the flightcrew member is given a rest period of at least ~~9~~ **10** consecutive hours before beginning the reserve or flight duty period measured from the time the flightcrew member reaches the hotel or other suitable accommodation.

**(d)(1) (*added*) An unacclimated flightcrew member shall be given at least 12 consecutive hours of rest beginning upon arrival at the rest facility before beginning a RAP or flight duty period.**

(e) ***(deleted)*** ~~In the event of unforeseen circumstances, the pilot in command and certificate holder may reduce the 9 consecutive hour rest period in paragraph (d) of this section to 8 consecutive hours.~~

**(f) (*added*) No certificate holder may schedule and no flightcrew member may accept an assignment for reserve or a flight duty period after completion of any duty period(s) (flight or reserve) in a new theater unless the flightcrew member is given a rest period upon return to the flightcrew member's home base location in accordance Table F.**

**(f)(1) *(added)* The recovery rest in Table F satisfies the requirements for acclimation and the flightcrew member would then enter Table B without a penalty.**

**Table F – Number of Local Nights for Recovery on Return to Home Base**

| Elapsed Time Since Leaving Home base (h) | Maximum Time Difference from Home Base (h) | | | | | |
|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8-9 | 10-12+ |
| 60-84h | 1* | 2* | 2* | 2* | 2* | 3 |
| 84-108h | 2* | 2* | 3 | 3 | 3 | 3 |
| 108-132h | 3 | 3 | 3 | 3 | 3 | 3 |
| 132-156h | 3 | 3 | 3 | 3 | 3 | 3 |
| 156+h | 3 | 3 | 3 | 3 | 3 | 3 |

**Note 1: The values in Table F refer to eastward transitions (eastward outbound/ westward homebound) only. * denotes that for westward transitions (westward outbound/eastward homebound) one extra day is required to be added to the value depicted.**

**Note 2: When the elapsed time away from home base is less than 60 hours one full local night's recovery rest should be provided on return to base, except when the returning flight duty period encroaches the WOCL, then an additional local nights rest will be added**

## 117.27 Consecutive nighttime operations *(amended)*:

No certificate holder may schedule and no flight crew member may accept more than three consecutive nighttime flight duty periods unless the certificate holder provides an opportunity to rest during the flight duty period in accordance with § 117.17.

**A fourth consecutive nighttime flight duty period may be assigned if the flight crewmember receives a minimum of 12 hours rest following each nighttime flight duty period.**

# Flightcrew Member Duty and Rest Requirements: Proposed Rule; Docket No. FAA-2009-1093
# Preamble Questions

1) Please comment on adopting maximum FDPs. Should the maximum FDP vary based on time of day?

**Yes, the maximum FDP should vary based on the time of day. The method of varying the maximum FDP based on the time of day recognizes a flightcrew member's circadian rhythms and adjusts the FDPs accordingly.**

Should it vary based on the number of scheduled flight segments?

**Yes. There are numerous studies indicating the longer a person spends on a given task the more fatigued they become.[23] As a pilot completes more takeoffs and landings they may become more fatigued and more error prone.**

Should the proposed limits be modified up or down, and to what degree?

**No, the proposed FDP limits do not require modification.[24]**

2) Please comment on permitting flightcrew members and carriers to operate beyond a scheduled FDP. Is the proposed 2-hour extension appropriate?
***(See IPA Comments regarding FDP Extensions)***

**Yes, two hours is a reasonable amount of time to provide a certificate holder with schedule flexibility due to unforeseen operational circumstances. Also, the IPA supports the proposed rule, which requires both the pilot in command and the certificate holder to jointly extend a FDP. Circumstances based strictly on an economic business consideration (such as holding an aircraft to wait for payload from a customer who is late) should not be considered a circumstance beyond the control of the operator.**

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[23] Studies which have investigated the effects of extended shift durations on worker performance may be relevant as they assess fatigue and performance as a function of the set of tasks that are performed during a shift rather than performance decrements that accrue on a single task." Battelle, *Supra* Note 16 at 10.

[24] For pilots with 13 or more hours of duty, the proportion of accident pilot duty periods is over five and a half times as high." Jeffrey H. Goode, *Are Pilots at Risk of Accidents Due to Fatigue*, 34 J. Safety Res. 309, 311 (2003).

**As currently proposed the regulation does not provide greater rest opportunities for augmented operations, therefore, the two-hour extension should remain the same for augmented operations, not be increased to three-hours as proposed under 117.19.**

Is the restriction on a single occurrence beyond 30 minutes in a 168-hour period appropriate?

**Yes, 30 minutes is an acceptable amount of time to provide an operator with flexibility. If the certificate holder requires more than 30 minutes on a regular basis a schedule adjustment would be necessary.**

Should a flightcrew member be restricted to a single occurrence regardless of the length of the extension?

**Yes, the single occurrence beyond 30 minutes in 168 hours ensures there is not abuse of the extension provision and reinforces schedule reliability. In the FAA's response to clarifying questions, the FAA agrees that a single duty extension in a 168-hour rolling period is appropriate. If delays were occurring on a regular basis a schedule adjustment would appear to be necessary.**

**3)** Please comment on the proposed schedule reliability reporting requirements. Should carriers be required to report on crew pairings that exceed the scheduled FDP, but not the maximum FDP listed in the FDP table? ***(See IPA comments regarding 117.9 Schedule Reliability)***

**Yes, operators should be required to report on any crew pairings that exceed the scheduled FDP regardless of the maximum FDP listed in the FDP table. Scheduled FDPs should be accurately constructed so that the scheduled FDP equates the actual FDP. If an operator were only to report exceeding the maximum allowable FDP that would not be a measure of scheduling reliability, instead it would only be a measure of exceeding the values set forth in the FDP tables. To achieve schedule reliability the individual flight segments must be considered. If a given segment within a pairing causes the pairing to exceed the limits, the certificate holder can merely leave the offending segment and change the pairing mix to bring it within limits. The segment would never be corrected.**

**We believe that a scheduling metric must be included in 117.9. Certificate holders now provide on-time reports to the DOT on an individual flight segment so this should not be a burdensome requirement. Also, by using flight segments that would address the operator's concerns regarding schedule reliability and minimal volume pairings that only fly twice a year and fail once. Finally, the schedule reliability report should be made available to all stakeholders and the public.**

4) Should carriers be required to report on more parameters, such as cumulative duty hours or daily flight time? If so, why?

**Yes, the reporting parameters required by the proposed rule should include total flight time (block time) per flight duty period, in addition to flight segment (city pair). The rationale behind measuring schedule reliability is because it directly impacts a flightcrew member's ability to plan rest. A flight duty period or scheduled block time that consistently exceeds planned schedule prevents a flightcrew member from being prospectively rested for duty.**

5) What should be the interval between reporting requirements?

**The reporting interval should be changed from 60 days to 30 days.**

6) How long after discovering a problematic crew pairing should the carrier be afforded to correct the scheduling problem?

**The IPA agrees with the FAA as stated in the FAA's Clarifying Questions (Docket No. FAA-2009-1093) document that the obligation to correct schedules that exceeded the percentages proposed in the regulatory text would be required once the certificate holder discovered the corrections were needed. A certificate holder should not be allowed to operate a schedule that violates the scheduling limitations longer than 30 days and should also not repeat the same problematic schedule from one season to the next.**

7) Is a 3-day adjustment to a new theater of operations sufficient for an individual to acclimate to the new theater? ***(See IPA comments regarding Acclimation)***

**During the ARC the sleep specialists noted that an individual would take approximately one hour per day for each hour of time zone difference to adjust his internal clock and acclimate to a new time zone (i.e. four days minimum to acclimate to a new theater). Although a much more compressed timeframe than explained by the sleep scientists, a 72-hour adjustment to a new theater of operations would be sufficient only if it included three local nights rest (physiological nights rest). Remaining in theater for 72-hours does not necessarily allow for three physiological nights rest. If a flightcrew member were to remain in theater for 72-hours <u>and</u> given at least 36 consecutive hours free from duty in that theater the flight crewmember would be adequately synchronized to the new theater because it is necessary to have both time in theater and adequate rest to become acclimated. This issue is further discussed in our comments.**

8) Is a 36-hour break from duty sufficient for an individual to acclimate to a new theater?

**As discussed in question #7, a minimum 36-hour break from duty is sufficient for an individual to acclimate to a new theater only if that individual has been in that theater for 72-hours. The IPA agrees with the FAA that the 36-hour break should be predicated on actual time and not scheduled time.**

9) Should flightcrew members be given a longer rest period when returning to home base than would otherwise be provided based on moving to a new theater? ***(See IPA comments regarding 117.25 Rest Period)***

**Yes. We have proposed a modification to Section 117.25 to provide a table for recovery rest on return to home base. This concept is contained in numerous international regulations and current FAA regulations.**

10) Should the FAA have different requirements for flightcrew members who have been away from their home base for more than 168 hours? If so, why?

**Yes, these flightcrew members may have crossed multiple times zones and operated with irregular duty hours over the course of the week resulting in circadian disruptions. Additionally, many of these types of pairings have consecutive or multiple 24-hour layovers resulting in cumulative sleep debt. Extended recovery sleep is necessary to fully restore the individuals sleep reservoir and recover from the effects of cumulative and transient fatigue.**

**We also believe that there should be recovery rest for time away from home operating flights in a different theater that is less than 168 hours. The current regulations provide for recovery rest in international operations for operations less than a 168 consecutive hours period. See FAR 121.483, 121.485, 121.523, 121.525**

11) Should the FAA require additional rest opportunities for multiple pairings between two time zones that have approximately 24-hour layovers at each destination? What if the scheduled FDPs are well within the maxima in the applicable FDP table or augmentation table? ***(See IPA comments regarding 24-hour Layovers)***

**Yes, rest needs to be adjusted and multiple 24-hour layovers should be limited on consecutive days and on a weekly basis. The difficulty with 24-hour layovers is the crewmember has to get two sleep opportunities in one off duty period, which results in a circadian shift of the pilot's "body clock" resulting in a sleep debt. Further compounding this sleep debt are multiple 24-hour layovers on**

**consecutive days. The result is a cumulative sleep debt and increased fatigue. The length of the FDP is irrelevant because the issue with 24-hour layovers is specific to the amount of rest an individual can obtain in the 24-hour off duty period. It is impossible to obtain two full sleep cycles in a 24-hour period. The IPA suggests limiting flightcrew members to no more than two scheduled layovers between 18-30 hours in a rolling 168 hours to prevent accumulated sleep debt.**

12) If the FAA adopts variable FDP limits, is there a continued need for daily flight time limits? ***(See IPA comments regarding 117.13 Flight Time Limitation)***

**Yes, it is necessary to maintain daily flight time limits even with the variable FDP limits. The maximum FDP permitted in the NPRM is 13 hours, if we assume a 1-hour report time that would permit an operator to schedule an un-augmented flight crew up to 12 hours of flight time, which represents a fifty-percent increase from the current FAR flight time limit of 8 hours. There have been no studies on the affects of altitude, noise, vibration and limited movement on flight crews. Until such studies are completed it is prudent to err on the side of safety, just as has been stated in the preamble to the proposed regulation. These limits have been in place since the beginning of the flight limitation regulations and there is no basis not to continue these limits.**

13) If the FAA retains daily flight time limits, should they be higher or lower than proposed? Please provide data supporting the answer.

**The proposed daily flight time limits should more accurately reflect the majority position of the ARC, including industry and labor. As discussed in the answer to question #12, there is an absence of scientific data supporting a dramatic increase in flight time limits.**

**Equally as important the maximum flight time limits must state, as proposed in 117.13, "No certificate holder may schedule and no flightcrew member may accept an assignment or continue an assigned flight duty period if the total flight time: (a) will exceed the limits specified in Table A of this part if the operation is conducted with the minimum required flight crew." The language in the NPRM differs from current regulation and determines block time to be a hard limit, not a scheduled limit as it is today. Foremost, the most frequently abused provision of the current rules is the "scheduled flight limitation provision." Certificate holders consistently schedule to the limit, i.e. 7:59, even when they know in advance that the flight on a given day will not meet the scheduled time because of winds or ATC delays at busy airports. Under the current FARs eight hours scheduled flight time could realistically be in excess of nine hours, under the proposed NPRM eight hours would mean exactly that, eight hours. The new language will require the operators to schedule more realistically and supplements 117.9. With the sophisticated scheduling programs and historical**

**data available to certificate holders, the implementation of this provision should be accomplished at minimal cost.**

**Additionally, under the current FAR 121.471 the regulation permits flight time to be exceeded provided compensatory rest will be scheduled. The proposed rule prescribes only a minimum rest period and does not take into account additional rest for exceeding flight time limits. If Table A were scheduled there would be no protection for fatigue caused by the exceedures, therefore, flight time limits should remain hard limits and not scheduled limits.**

**The IPA does recommend that Table A be modified to reflect the unanimous view of the ARC that the limit be 7 hours for the early morning hours and the majority view that it be 7 hours for the late evening hours. Likewise, the majority view was that the maximum limit should be 9 hours, which is a 12.5 percent increase when compared to the current rule. Even if certificate holders have to "buffer" schedules, they will be in no worse position than they are today because of the increased limits.**

**Finally, the definition of flight time in FAR 1.1 currently defines flight time as the moment the aircraft fist moves under its own power. However, often the PIC is responsible and performing his duties when the aircraft is moved by a tug or remains at the gate with the engines running, and that time should count as flight time if the movement is with the intention for flight. This definition is consistent with EU-OPS subpart Q which provides:**

**"The time between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped."**

14) Should modifications be made to the proposed flight time limits to recognize the relationship between realistic flight time limits and the number of flight segments in an FDP?

**The proposed limits correctly address the need for lower FDP limits when multiple segments are being flown**.

15) Should augmentation be allowed for FDPs that consist of more than three flight segments? ***(See IPA comments regarding 117.19 FDP: Augmented Flightcrew)***

**No, multi-leg augmentation should only be allowed if no crew change is possible. Page 55866 of the Preamble states, "however, the initial theory behind augmentation was that it was simply impossible to place a fresh crew aboard the**

**aircraft." In no case should augmented operations contain more than two segments. The proposed chart in Table C to Part 117-Flight Duty Period: Augmented Operations is based on the TNO Report which only evaluated single flight segment duty periods.**

**Multi-leg augmentation should never be used solely for the purpose of extending a flight duty period. A freshly rested flightcrew is always preferable to a flightcrew who has had a long duty period. Onboard rest is fragile and merely a countermeasure to mitigate fatigue and may not always be obtained due to factors such as turbulence, time of day and readiness to sleep.**

Does it matter if each segment provides an opportunity for some rest?

**From the NPRM Preamble, "The proposed requirement for the 2-hour rest opportunity on the last flight segment is designed to address a common recognition among the ARC members that, even on a flight with only two segments, the last segment is often of such duration that there is no realistic rest opportunity, even though this is when the crew is likely to be the most fatigued." We agree and have recommended that the last flight provide an adequate sleep opportunity, two hours each for both pilots at the controls during approach and landing, for a minimum segment length of six hours. In reality this may operationally allow a FDP containing a short flight, followed by a long flight. In some cases this may preclude a rest opportunity on the first short flight. At no time should an operation consist of a long flight followed by a short flight.**

**We recommend a 2-hour consecutive sleep opportunity for both required crewmembers at landing. Both crewmembers manipulate the controls, i.e., the non-flying pilot normally operates flaps, landing gear and radios and performs monitoring duties so he must be equally alert. Much emphasis has been placed on the concept of crew resource management (CRM) and pilot monitoring duties. Also, there are circumstances such as Category III approaches where the pilot monitoring might actually be the pilot landing. To deprive any of the operating flightcrew members an in-flight rest opportunity would not help mitigate fatigue and violates the spirit and intent of augmented flight.**

16) Should flight time be limited to 16 hours maximum within an FDP, regardless of the number of flightcrew members aboard the aircraft, unless a carrier has an approved FRMS?

**Yes, flight time should be limited to 16 hours maximum within an FDP. Anything beyond 16 hours should require FRMS**

17) Should some level of credit be given for in-flight rest in a coach seat? If so, what level of credit should be allowed? Please provide supporting data.

**No credit should be given for rest in a coach seat. Sleep scientists document obtaining rest without leg and foot support and the ability to recline at least 40 degrees as difficult. Page 55864 of the Preamble states, "in-flight sleep has restorative value and the flatter one is able to lie, the more beneficial the sleep." Additionally, the note at the bottom of the page states, "sitting up increases blood flow to the brain and causes emission of norephrenephrine, which is stimulative instead of relaxing."**

18) Is there any reason to prohibit augmentation on domestic flights assuming the flight meets the required in-flight rest periods proposed today?

**Yes, domestic augmentation should be prohibited. Domestic augmentation has the potential to be a deliberate lowering of pilot alertness for economic gain and goes against the original intent and spirit of augmentation. A freshly rested flightcrew is always preferable to a flightcrew who has had a long duty period. Science does indicate that the sleep quality in an aircraft rest facility is not equivalent to the sleep in a bed. Noise, vibration and low humidity are elements that contribute to fatigue and will always be present on an aircraft.[25] Additionally, bunk size, turbulence and readiness to sleep are factors that may be present and can impact the quality of sleep. Onboard rest facilities simply do not provide the same level of rest that a ground based rest facility does. Onboard rest is merely a countermeasure to mitigate fatigue and should not be a substitute for a normal rest period. Domestically, there is always an ability to change crews. Permitting domestic augmentation is a step backwards from current FARs and does not enhance aviation safety for the flying public by mitigating pilot fatigue.**

19) Are the proposed required rest periods appropriate? ***(See IPA comments regarding 117.25 Rest Period)***

**The IPA applauds the FAA for recognizing rest should begin when the flightcrew members reach the hotel. The IPA recommends 10 hours of rest at the rest facility. According the FAA's own Fitness for Duty Advisory Circular, AC120-FIT, "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**

[25] M.R Rosekind, D.L. Miller, K.B. Gregory, and D.F. Dinges, *Crew Factors in Flight Operations XII: A Survey of Sleep Quantity and Quality in On-Bard Crew Rest Facilities*, (NASA Technical Memorandum 2000-209611, Moffett Field, California) (2000) at 1.

**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."**

**Also it should be recognized that a flight from the U.S. to Europe or Asia disrupts the circadian cycle and a rest of 9 hours is not sufficient to achieve an appropriate level of alertness. When a flightcrew member is unacclimated they should be given at least 12 hours rest at a suitable accommodation until acclimated. We also believe that there should be recovery rest for time away from home operating flights in a different theater that is less than 168 hours. The current regulations provide for recovery rest in international operations for operations less than a 168 consecutive hours period (FAR 121.483, 121.485, 121.523, 121.525)**

**We also do not believe that scheduled rest periods should ever be reduced below the 10-hour and 12-hour proposed. The only time this could be a factor would be after an extended FDP, which is exactly the time when a good quality sleep opportunity is required.**

20) Should credit be allowed if a flightcrew member is not type-rated and qualified as a PIC or SIC?

**No, relief on the flight deck during augmented operations must ensure that it is by flightcrew members with the same or greater level of qualification on that segment. All flightcrew members are required to be current and qualified type-rated as a second-in-command (SIC) or pilot-in-command (PIC). These qualifications provide a consistent level of safety in the event of an emergency.**

21) Please comment on whether a single occupancy rest facility provides a better opportunity for sleep or a better quality of rest than a multiple occupancy facility**.**

**A single occupancy rest facility is superior to obtain an adequate level of rest. A single occupancy facility provides a crewmember a rest opportunity free from environmental and interpersonal disturbances that may be present in a multiple occupancy facility.**

22) Should there be any restriction on consecutive nighttime operations? If not, why? ***(See IPA comments on 117.27 Consecutive Nighttime Operations)***

**Yes, there should be a limit on consecutive nighttime operations. Flight operations that impinge on the WOCL contribute to circadian fatigue and transient fatigue, which may also result in cumulative fatigue. Also, daytime sleep**

**is more difficult than nighttime sleep resulting in greater fatigue. Nighttime operations should be limited to 3 nights unless there is some sort of fatigue mitigation strategy.**

23) If the nighttime sleep opportunity is less than that contemplated under the split duty provisions of this notice, should a carrier be allowed to assign crew pairing sets in excess of three consecutive nights? Why or why not?

**We agree with the FAA and science that consecutive nighttime duty periods contribute to sleep debt and increased fatigue. We also agree with science that fatigue can be mitigated to some extent when a flightcrew member is given a sleep opportunity in a suitable accommodation. However, we do not believe this sleep opportunity mitigates the fatigue associated with an extended flight duty period and should not be used to extend a flight duty period.**

24) If the nighttime sleep opportunity meets the split duty provisions of this notice, should the carrier be allowed to extend the flight duty period as well as the number of consecutive nighttime flight duty periods? Why or why not?

**No, the carrier should not be allowed to extend the flight duty period. The FDP table was constructed based on acknowledging that duty during the WOCL contributed to fatigue. The sleep opportunity afforded during split duty should be to mitigate fatigue not to extend a flight duty period.**

25) Should a fourth night of consecutive nighttime duty be permitted if the flightcrew member is provided a 14-hour rest period between nights three and four?

**The FAA's concept in the proposed rule to allow a fourth consecutive nighttime duty is better handled by requiring 12-hours of rest before each nighttime duty period as recommended in the language proposed in this submission.**

26) Please comment on whether a 16 maximum hour FDP for long call reserve is appropriate when the maximum FDP for a lineholding flightcrew member is 13 hours**.** ***(See IPA comments regarding 117.21 Reserve Status)***

**The FDP for a long call reserve should be 13-hours which is equivalent to the maximum duty period as a lineholding flightcrew member. Since a long call reserve receives the same pre-duty rest as a line holder there is no rationale to assume he can work longer. The same physiological considerations should be given to each flightcrew member regardless of his schedule status.**

27) Please comment on whether the proposed maximum extended FDP of 22 hours for an augmented flightcrew member is appropriate. If not, please provide an alternative maximum FDP.

**The proposed maximum extended FDP of 22 hours is not appropriate. The maximum proposed FDP should be the maximum FDP 18 hours.**

28) Please comment on whether a certificate holder should receive credit for not calling a flightcrew member during the WOCL while on reserve.

**Yes. If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the air carrier may increase the maximum reserve duty period by one-half of the length of the time during the reserve availability period in which the air carrier has not contacted the flightcrew member, not to exceed 3 hours. However, the maximum reserve duty period may not exceed 16 hours. This credit will only be calculated for the time during 0000-0600 before the flightcrew member was contacted. In both the ARC and the NPRM preamble, the intent was expressed that RAP extension credit is to be made available for not contacting reserves between 0000 and 0600 whose RAP's touch that time period. However, the proposed language in 117.21(c)(4) (iv) and 117.21(c)(5)(iii) neglects this distinction, providing credit for *any* period of non-contact.**

29) Should minimum required rest while on reserve status be greater than the amount of rest required for a lineholding flightcrew member? If so, please provide supporting data, if not, please provide rationale.

**No, minimum rest for reserve and a line holder should be the same to provide an equivalent level of safety.**

30) Please comment on the level of complexity on the proposed reserve system.

**The short call reserve section is complex and we are concerned that there may be misunderstanding by flightcrew members, scheduler and management officials as currently written. Consistent with other limitations in the proposal, we believe a chart is a better way to set forth the short call reserve limits expressed in the proposal. We urge that the chart contained in our comments that sets forth the short call reserve limits be adopted. *(See IPA Comments regarding 117.21 Reserve Status*)**

31) The FAA seeks input on the appropriate cumulative limits to place on duty, flight duty periods and flight time. Is there a need for all the proposed limits?

**Yes, the proposed cumulative duty and flight time limits need to be retained as proposed. Just as the certificate holder tracks flight time and flight duty periods, administrative duties should also be tracked. Administrative duties include any duty required by the certificate holder and counts towards daily and cumulative duty limits just as short call reserve does.**

32) The FAA also asks for comments on measuring limits on an hourly rather than daily or monthly basis. Does this approach make sense for some time periods but not for others?

**Hourly limits make sense for daily and weekly limits, but monthly limits should be based on 28 calendar days. Annual limits should also be based on calendar days.**

33) If transportation is not considered part of the mandatory rest period, is there a need for a longer rest period for international flights?

**Yes, we recommend 12-hours as a minimum. Crossing multiple times, an individual's readiness to sleep, circadian de-synchronization and wrong time of the day for sleep are all factors impacting fatigue when flying internationally. *(See IPA Comments regarding 117.25 Rest Period*)**

34) Whether some elements of an FRMS, such as an incident reporting system, would be better addressed through a voluntary disclosure program than through a regulatory mandate? ***(See IPA Comments regarding 117.7 FRMS*)**

**We strongly support the introduction of FRMS in the U.S. Aviation System. We do, however, believe that Section 117.7(b) needs to be amended to include the following items:**

- **The FRMS must be an equal partnership that includes the FAA, the certificate holder and non-management pilot representative.**
- **FRMS does not replace the regulatory scheme; its purpose is to supplement adequate prescriptive rules.**
- **Any FRMS must provide an equivalent or better level of safety and be centrally approved by the FAA. (One office at FAA headquarters should be responsible for approving FRMS. This is the only way to provide a uniform FRMS approval scheme.)**

- **FRMS should be limited to specific certificate holders' data and scheduled city pairs, which must be scientifically and then operationally validated by all stakeholders.**

- **FRMS, like SMS, requires a commitment from the certificate holder's senior management team and a specified line of accountability in the organization.**

35) Are there other types of operations that should be excepted from the general requirements of the proposal? If so, what are they, and why do they need to be accommodated absent an FRMS?

**No. We believe that the single set of rules approach to fatigue is the correct and reasonable approach. The human physiology of fatigue is the same regardless of the type of operation. Any exceptions to the rules should be rare and addressed only through an instituted FRMS. To that end, the FRMS section 117.7 of the proposed rule should clearly state that an FRMS is meant to address individual exceptions by pairing and city pairs, not to replace this entire proposed rule set for a specific carrier.**

## IPA's Response to Questions Posed in the Response to Clarifying Questions

1) The FAA is open to suggestions on how to improve the clarity of the proposed regulatory text regarding schedule reliability.

**The IPA has proposed modifications to Section 117.9 to clarify the language and add a flight segment metric.**

2) The agency is interested in suggestions on how to measure the reliability of infrequently flown pairings in unscheduled operations.

**These pairings in the aggregate would be captured in the system-wide flight duty metric and a single FDP would fall under the 20 percent metric. While the FDP is not "scheduled" in advance, it is nevertheless a FDP with a start and end time when the flight crew receives the assignment. This could be captured in a record and used to demonstrate compliance.**

3) The FAA seeks comment on allowing a certificate holder to reschedule a flight crewmember if the rescheduled time is within the limits of Tables B and C.

**We support the FAA's proposed language and believe the 2 hour extension of a scheduled flight duty period is appropriate for rescheduling events during, "unforeseen circumstances beyond the carrier's control." We anticipate these types of situations to be a rare occurrence.**

4) The FAA seeks comments when a certificate holder's customer demands less than a 2 hour final segment and situations where both crewmembers are manipulating the controls.

**The final segment must allow 2 hours of rest for each pilot occupying a control seat during the landing. For a single crew this would require a minimum 6 block hour segment. For a dual crew this would require a minimum 3 + 45 block segment. These block times are based on 45 minutes from block out to top of climb, 2 hours of sleep opportunity and 1 hour in the seat prior to block in for the crew performing the landing. For single augmented crews 15 minutes is required for pilot swap out in the rest facility. As you can see, there are options available to the certificate holder to safely satisfy the wants of a customer. These limits should be mandated by the FAA to ensure operators truly allow a realistic sleep opportunity.**

5) The FAA seeks input on whether the flight crewmember must be current on the aircraft and actually at the controls rather than simply on the flight deck.

**It is our position that both flight crewmembers occupying a control seat throughout the flight must be current (including landings) and qualified (to include Operational Experience). This is essential so that qualified flightcrew are immediately available in the cockpit to handle any in-flight emergencies from cruise altitude thru landing, especially during a security lockdown. Additionally, given that sleep science indicates up to 30 minutes**

**may be required to overcome the affects of sleep inertia, the option of waking up a sleeping qualified flightcrew member during a time critical emergency is ineffective. Integrity of augmented crew for the entire FDP is essential.**

6) Should short call reserve count as duty?

**Yes. The agency has consistently interpreted reserve duty to be a present responsibility for duty. In our view, that is tantamount to duty. The flight crewmember is restricted in his/her activities and must be prepared to perform flight duty when called on short notice. We agree that flight crewmembers in reserve status can acclimate just as any other flight crewmember.**

7) Can a certificate holder assign additional duty time if there is no additional FDP contemplated for the relevant time period?

**No. An extreme example would be the completion of a 18-hour augmented flight duty period followed by an immediate scheduling of an 8-hour training period. The level of cumulative fatigue without an intervening rest period is unacceptable. Any duty (FDP, reserve, training) performed on behalf of the carrier should require the appropriate minimum rest period before beginning the duty period. We believe that the cumulative duty periods should apply as written. The consecutive duty limits apply to crewmembers that do fly and these limits are necessary to assure alertness over a longer period of time. Also, the "implied 16 hour duty day" as stated in the Preamble should be part of the regulatory scheme. If a management or other pilot wants to work excessive hours performing administrative duties, he or she should relinquish flight duties.**

8) Does Union work count as administrative time?

**Yes, however the difficulty is that the work is not performed for the certificate holder, not required to be reported to the certificate holder, is difficult to track and even more difficult for the FAA to oversee. An individual performing administrative time for the carrier has a defined work schedule easily monitored by the carrier. As previously stated within the findings it is incumbent upon all flight deck crewmembers to ensure they are adequately rested prior to reporting for any flight deck duty period. Not only would this apply to those who would be engaged in labor representative activities but any other activity outside of that associated with the flight deck duty period. This concept is covered within the requirement to report fit for duty.**

9) The FAA seeks input on a circumstance where a flight crewmember is at the end of the cumulative duty period but cannot be released due to circumstances beyond the control of the certificate holder.

**We believe this would be an isolated occurrence limited to operations in an unsafe area or during extreme weather conditions and perhaps the best way to handle this issue is under the emergency powers of the PIC. Any further continuation of duty should be validated within an FRMS. It would be, in our view, so rare that it need not be addressed in a regulation but should be discussed in the accompanying guidance material.**

10) Is prospective scheduling of short call reserve in excess of cumulative duty limits permissible so long as actual duty limits are met?

**Since short call reserve is duty, this presents a circumstance where the schedule would have to be modified prior to the actual duty limits being reached. To over-schedule certainly would not be realistic scheduling and it would be disruptive to the crewmember. Cumulative duty limits should not be exceeded. We agree that this issue is best addressed in the labor-management context.**

The IPA is attaching the following document, which represents a consensus opinion and comments of all ARC Labor Representatives. The IPA was a participant to the summer 2009 ARC.

**BEFORE THE**
**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL AVIATION ADMINISTRATION**
**WASHINGTON, D.C.**

| | | |
|---|---|---|
| **Notice of Proposed Rulemaking for Flightcrew Member Duty and Rest Requirements** | ) | **Docket No. FAA-2009-1093** **Notice No. 10-11** |

**Comments**

**117.1 Applicability**

We are pleased that the FAA has acknowledged the current science and recognizes that pilot fatigue does not differ whether the pilot is operating domestically, internationally or in supplemental operations. We support the FAA's determination that one level of safety with regard to fatigue should apply equally to all Part 121 certificate holders.

**117.3 Definitions**

We propose the following additions and clarifications to the Definition section.

> **Acclimated** – means a condition in which a crewmember has been in a new theater for the first 72 hours since arriving **and** has been given at least 36 consecutive hours free from duty during the 72 hour period.

Rationale: The established science, as we demonstrate below, is that 3 consecutive local nights rest is required to become acclimated. CAP 371 recognizes this science and requires 3 consecutive local nights rest to be acclimated.

As the rule currently is written, it would allow carriers to provide 36 hours of uninterrupted rest at the layover location and then be considered "acclimated" to the local time zone. Such an assumption is incorrect for the following reasons:

1) For typical flights from the U.S. to Europe or Pacific destinations, the number of time zones crews would transit would be in excess of 5 or more. The general agreed upon acclimation rate is about 1 time zone or one hour difference per day.[26] Some expert researchers have published data showing even longer periods to become acclimated to the local time zone.[27] Conclusion: The crew would not be acclimated after 36 hours of layover rest.

2) While 3 consecutive physiological nights may start approaching a reasonable compromise for the purpose of entering the FDP tables, a 36 hour rest by itself clearly would not. In order for the rules to approach parity, the implication is that a night of normal sleep would be approximately 8-9 hours of sleep. Three nights of consecutive sleep would be 24-27 hours of sleep. The 36 hour rule suggests that crews would remain asleep for nearly the entire layover period. This is not physiologically plausible for healthy aircrews.

3) Further, when crews are put into a rest period, it is critical for any fatigue safety regulation to assess where they are in their own circadian cycle – as that will determine when in the following rest periods, crews would be able and likely to sleep from a physiological perspective. To be sure, being put into a rest cycle does not mean that the crew will be able to

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[26] It takes about one day for every time zone crossed to recover from jet lag. When circadian disruption and sleep loss occur together, the adverse effects of each are compounded.

Battelle Memorial Institute. March 1998. *A Review of Issues Concerning Duty Period Limitations, Flight Time Limitations, and Rest Requirements as stated in the FAA's Notice of Proposed Rulemaking 95-18*, 60 Fed. Reg. 244 (Proposed Dec. 20, 1995).

[27] For example: Gander, et al. (1989) showed that it took several days for the acrophase of the temperature rhythm to come within one standard error of complete resynchronization after a 9h westward transition, and that the adaptation in an eastward direction took even longer. *Paper presented at the RTO HFM Lecture Series on "Sleep/Wakefulness Management in Continuous/ Sustained Operations," held in Fort Rucker, Alabama, United States, 17-18 June 2002; Warsaw, Poland, 24-25 June 2002; Paris, France, 27-28 June 2002, and published in RTO-EN-016,* Gander PH, Myhre G, Graeber RC, Andersen HT, Lauber JK (1989*) Aviat Space Environ Med* 61: 733-743.

sleep according to a desired clock position. The crews' circadian phase will be the key-determining factor as to when and how long crews will subsequently sleep. In a 36 hour rest situation, crews could have only one full sleep cycle in their physiological nadir and if that falls early in the layover rest period, they would initially sleep, then be awake for an extended period before reporting for duty. At that point, the pilots, through no fault of their own, would be significantly fatigued after being awake for 12 to 15 hours prior to starting their duty period.

We believe that the regulation should require 3 local nights rest. However, during the first 72 hours in theater, measured from the time of first arrival, a 36 hour rest within the 72 hours may allow a flight crewmember to become acclimated. Merely being in theater for a 72 hour period without at least 36 consecutive hours rest during that time would not allow a person to become acclimated. It is necessary to have both time in theater and adequate rest to become acclimated. The preamble to the proposed regulation states that the tables selected from the ARC were in part based on being the most conservative approach. The wide range of available research on the topic of acclimation, combined with operational experience, clearly supports a more conservative approach of 72 hours in theatre with 36 hours free of duty to consider the crew acclimated.

**Acclimated Local Time - means the local time at the location where the pilot last had greater than 36 hours free from duty in the first 72 hours in theater.**

Rationale: This definition provides an unambiguous time for applying the definition of Nighttime Duty Period and for entering the FDP and Flight Time limit tables. The original NPRM wording of "acclimated or home base" time left many questions of interpretation. For example, a USA based pilot who acclimates in Europe and then subsequently flies to Japan would, under the current wording, enter the tables at Home Base time instead of Europe time. Similarly, the exact location of acclimation must be known to determine future loss of

acclimation. For example, a pilot flies to Paris and has 37 hours off, but at the end of his 72 hours in theater happens to be 3 more hours east at Tel Aviv. He is now acclimated, but where? Would a further flight two more hours east to Dubai cause him to be unacclimated? It depends whether you define the point of acclimation as being tied to the 36 hour rest or to the 72 hours in theater condition. The above proposed definition removes such doubts about the location of acclimation and the use of regulatory tables, allowing practical and reliable computer programming of scheduling. Under this proposal, both the tables and the definition of Nighttime Flight Duty Period would then use the new term, "Acclimated Local Time".

> **Consecutive night duty period - means two or more night flight duty periods that are not separated by at least a Part 117.25 rest between the duty periods that encompasses a physiological night's sleep (1:00 am to 7:00 am at home base or acclimated local time).**

Rationale: Part 117.27 limits consecutive nighttime flight duty periods to three periods. The term *consecutive night duty period* is not defined, and to avoid confusion in applying 117.27 we believe it should be defined.

> **Flight Time – means when the aircraft first moves with the intention of flight.**

Rationale: The FAA in FAR 1.1 currently defines flight time as the moment the aircraft first moves under its own power. However, the PIC and required flight deck crewmembers are always responsible and must perform their duties when the aircraft is moved by a tug or sits on a hardstand and that time should count as flight time if the movement is with the intention for flight. This definition is consistent with EU-OPS subpart Q which provides:

> "The **time** between an aeroplane first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are stopped."

> **Nighttime Flight Duty – means a duty period during which any part of the duty period falls within the home base or acclimated local time period of 0200 to 0459.**

Rationale: The term "nighttime flight duty" is not defined and to avoid confusion in applying 117.27 we believe it should be defined. The Nighttime Flight Duty definition we have used is the CAP 371 definition which we believe is scientifically correct.

**Rest Facility** definition should include the following clarification:

**"A rest facility on an aircraft shall only be used for in-flight rest opportunities."**

Rationale: This statement will eliminate any temptation to have crews obtaining their Part 117.25 or Part 117.17 rest on the aircraft when it is on the ramp. A bunk or seat on an aircraft is simply not a suitable rest facility on the ground.

**Schedule Reliability – means the accuracy of the length of both a scheduled flight duty period and a <u>scheduled flight segment</u> as compared to the actual flight duty period <u>and segment</u>.**

Rationale: This change in definition to include measurement of "flight segments" is necessary for consistency with our proposed changes to 117.9 below.

**Suitable accommodation - means a <u>single occupancy</u>, facility with sound mitigation that provides a crewmember with the ability to sleep in a bed and to control light.**

Rationale: Operational experience has demonstrated that a <u>single occupancy</u> room is required. Otherwise, disruptions such as the other person reading, watching TV, snoring, etc., will disrupt the roommate's rest.

**Theater - means a geographical area where local time at the crewmember's flight duty period departure point and arrival point differ by no more than 4 time zones or 60 degrees of longitude.**

Rationale: Theater is a term used in the proposed regulation and should be defined. 60 degrees of longitude is necessary for those countries such as China which for political reasons is a single time zone.

**Unacclimated – A pilot becomes unacclimated if he has traveled to a location more than 4 time zones or more than 60 degrees of longitude from the location at which he was last acclimated.**

Rationale: The NPRM references "unacclimated" in several sections of the proposed regulation but does not define the term. We believe it should be defined. Defining acclimation in terms of "time zones" is subject to whim of governmental policy, (e.g., all of China is in a single time zone even though it spans 5 normal time zones in width). 60 degrees of longitude is equivalent to 4 normal time zones and should be included as a supplement to the time zone metric.

**117.5 Fitness for Duty**

We support the concept that a flight crewmember must be fit for duty prior to operating an aircraft. The fitness for duty is and must be a joint responsibility of the certificate holder and the flight crewmember. While it is important that both the flight crewmember and the certificate holder be involved in fit for duty determinations, we cannot create an environment that requires tracking and reporting the activities of an individual flight crewmember prior to their reporting for flight duty. Such tracking would be difficult, costly and impractical for the certificate holder to administer and would constitute an unwarranted invasion of the personal privacy of the flight crewmember. The proposed provision provides a framework for educating and encouraging responsible jointly-managed commuting policies. The proposed 117.5 should be adopted as written and the accompanying Advisory Circular (AC 120-FIT) should be removed from the docket, as the topic itself was not exposed to the same peer review and recommendations that other aspects of the proposed rule were during the ARC process. The FAA took a path in AC 120-FIT significantly different from ARC recommendations. If it is the desire to continue down this path, all of the applicable stakeholders should have a similar opportunity to provide input in the process and a corresponding comment period should follow separate from this rulemaking.

We would recommend a process set up where this occurs and would recommend an ARAC approach so that the issue is properly identified and jointly addressed.

**117.7 Fatigue Risk Management System (FRMS)**

We strongly support the introduction of FRMS in the U.S. Aviation System. We do, however, believe that Section 117.7(b) needs to be amended to include the following items:

- **The FRMS must be an equal partnership that includes the FAA, the certificate holder and a non-management pilot representative.**
- **FRMS does not replace the regulatory scheme, its purpose is to supplement adequate prescriptive rules.**
- **Any FRMS must provide an equivalent or better level of safety and be centrally approved by the FAA. (One office at FAA headquarters should be responsible for approving FRMS. This is the only way to provide a uniform FRMS approval scheme.)**
- **FRMS should be limited to specific certificate holders' data and scheduled city pairs or substantially similar city pairs in terms of FDP length, start time and block, which must be scientifically and then operationally validated by all stakeholders.**
- **FRMS, like SMS, requires a commitment from the certificate holder's senior management team and a specified line of accountability in the organization.**

Rationale: A FRMS comprises a comprehensive range of procedures that are both scientifically based and data-driven, allowing a cooperative and flexible means of managing fatigue. There remains a requirement for the regulator to provide prescriptive flight and duty time rules for operators not embracing FRMS principles. Such a set of rules will also provide a base line against which the fatigue levels of any FRMS can be compared, and in the case where an FRMS does not provide at least an equivalent level of safety to the prescriptive scheme, provide a reversion. Operators may, subject to regulator approval, embrace FRMS for all or part of their operations.

The *purpose* of any FRMS is to ensure that flight crew members are sufficiently alert so that they can operate to a satisfactory level of performance and safety under all circumstances.

A FRMS supplements prescribed flight and duty time regulations and other validated independent scientific research based software tools by applying safety management principles and processes to proactively and continuously manage fatigue risk through a partnership approach requiring shared responsibility among management and crew members. These changes to the prescriptive rules must be operationally validated prior to acceptance. It can therefore only operate in circumstances where all stakeholders, particularly the pilot body, support the operation of a FRMS. Accordingly, an open reporting system and non-punitive working environment, sometimes referred to as a "just culture" is a prerequisite within the organization for a FRMS to exist because crew feedback is an essential component of the program. All successful safety programs such as ASAP and FOQA are based on a three-way partnership and FRMS should be the same. A FRMS must specify the prescriptive regulatory scheme upon which it is based. In the event of suspension, termination or revocation of FRMS, the carrier's affected operations shall revert to the baseline prescriptive scheme.

FRMS is intended to be used to supplement prescriptive fatigue management regulations as a means of ensuring that flight crew remain sufficiently alert during duty to achieve a satisfactory level of operational performance and hence safety under all circumstances. A well developed and managed FRMS integrates operational and scientific data such as physiological and behavioral measures in the scheduling of crew members by providing a balance between duty types, crew rest and recovery. In the case of extended flight duty periods with augmented crew, such as ultra long range (ULR) operations, the planning of in-flight rest can be optimized.

FRMS must be based on a partnership approach for which there is agreement between the operator, regulator and pilot body. As FRMS is a new emerging concept, a Memorandum of Understanding between principle stakeholders should form the basis of initial agreement and be the subject to on-going periodic review based on assessment of the effectiveness of the program in achieving its stated goals. The Memorandum of Understanding must include a mechanism for the representatives of the stakeholding pilots to unilaterally suspend or terminate participation in the operator's FRMS in the event that the representatives of the stakeholding pilots determine in their discretion that the FRMS program's safety *purpose* is not being met.

Pilot representatives, either from, where such a body exists, an established organization independent of the company, or where such a body does not exist, independently elected directly by the pilots, must be included as members of the operator's Fatigue Management Steering Group. This committee will be fully involved in the initial development of the FRMS program, and shall be fully and directly involved in the on-going oversight of the operator's FRMS program including the development of modifications of the FRMS to meet the program's safety *purpose*.

**117.9 Schedule Reliability**

We propose the following additions and changes to the Schedule Reliability section:

**117.9(a)** Change 60 days to **30 days**

**(a)(2)(*modified*) Any scheduled flight segment that is shown to actually exceed schedule 20 percent of the time.**

**(b)(*modified)* Each certificate holder must submit a report detailing the scheduling reliability adjustments required in paragraphs (a) of this section to the FAA every**

**30 days detailing the overall scheduling reliability, and flight segment reliability. Submissions must consist of:**

**(2) The carrier's flight segments on a per segment basis and the list of those segments exceeding the 20 percent requirement in (a)(2).**

Rationale: These proposed amendments accomplish two changes to the proposed rule. First, the reporting period is 30 days rather than 60 days and second, a flight segment reliability requirement is added.

If a schedule exceeds the limits in this section the certificate holder should take prompt action to correct the schedule. A certificate holder should not be allowed to operate a schedule that violates the scheduling limitations for 60 days. With the sophisticated computerized scheduling programs available and used by most if not all certificate holders, a 30 day reporting period is neither unreasonable nor burdensome. The certificate holder should correct any schedule exceedance at the point the certificate holder becomes aware that the schedule does not meet the scheduling limitations. This is particularly true considering the amount of change in an air carrier's flight crew schedule month to month.

To achieve schedule reliability the individual flight segments must be considered. If a given segment within a pairing causes the pairing to exceed the limits, the certificate holder can merely leave the offending segment and change the pairing mix to hide the problem and/or bring it within limits. The problem segment would never be corrected. We believe that a scheduling metric must be included in 117.9. Certificate holders now provide on-time reports to the DOT on an individual flight segment so this should not be a burdensome requirement.

**117.13 Flight Time Limitation**

We propose that Table A which specifies flight time limits be amended as follows:

**Table A—Maximum Flight Time (Block) Limits**

| Time of Report (Home Base or Acclimated Local Time) | Maximum Flight Time (hours) |
|---|---|
| 0000-0459 | 7 |
| 0500-0659 | 8 |
| 0700-1259 | 9 |
| 1300-1959 | 8 |
| 2000-2359 | 7 |

Rationale: The flight time limits must be "hard" and not scheduled for several reasons. Foremost, the most frequently abused provision of the current rules is the "scheduled flight limitation provision." Certificate holders consistently schedule to the limit, i.e., 7:59 or 7:55, even when they know in advance that the flight on a given day will not meet the scheduled time because of winds or ATC delays at busy airports. In practice, many of these schedules exceed 8 hours by 45 minutes or more.

The hard limits would be applied like "Whitlow" is with the 16 hours duty limit. As the FAA and others will recall, in 2001 the certificate holders resisted Whitlow on the grounds that the cost would put certificate holders out of business. We anticipate the same approach to this NPRM. In their request to stay enforcement of Whitlow, the RAA stated that the Whitlow interpretation would "bring about the demise of smaller carriers." They would be required to hire numerous flight crewmembers and the cost would mean elimination of service to smaller cities. Likewise, the ATA complained that enforcement of Whitlow would inconvenience the traveling public as their members would have to delay and cancel flights. Additionally, the ATA carriers would be subjected to having to hire many additional flight crewmembers incurring tremendous costs for salaries, benefits and training.

For this reason they engaged in litigation to overturn Whitlow. When that effort failed, the certificate holders implemented the interpretation with little or no impact on their operation. They adjusted their scheduling practices with minimal or no cost. It can be anticipated that the certificate holders will take the same position on hard limits as they did with Whitlow. *The sky is falling* approach should be rejected. With the sophisticated scheduling programs and historical data available to certificate holders, the implementation of this provision should be accomplished at minimal cost. Another reason these limits must remain hard is that the current protection for exceeding schedule, which is *compensatory rest,* is not included in this proposal. If Table A were to be scheduled rather than actual flight time there would be no protection for fatigue caused by the exceedances. We do recommend that Table A be modified to reflect the unanimous view of the ARC that the limit be 7 hours for the early morning hours and the majority view that it be 7 hours for the late evening hours.

Likewise, the majority view was that the maximum limit should be 9 hours for the 0700-1259 time period, which is a 12.5 percent increase when compared to the current rule. Even if certificate holders have to "buffer" schedules, they will be in no worse position than they are today because of the changed limits. In most instances, they will receive a distinct advantage with the increased flight limits.

**117.19 Flight Duty Period: Augmented Flightcrew**

We propose the following amendments and additions to 117.19.

Amend (c)(1) to read:

**117.19(c)(1) The final segment provides a minimum of 2 consecutive hours available for in-flight rest for both flightcrew members occupying a control seat during landing. (This would require a minimum segment length of 6 hours for a 3 pilot crew and 3:45 for a 4 pilot crew to achieve the required rest).**

117.19(c)(3) deleted.

**117.19(d)(*modified*)** No certificate holder may assign and no flightcrew member may accept an assignment involving more than **2** flight segments under this section unless the certificate holder has an approved fatigue risk management system under §117.7

Rationale: As an administrative matter, we have pointed out in our clarifying questions on the docket that Table C as published in the NPRM has an incorrect heading. The Table heading needs to match Table B and the "Time of Start" should include home base or acclimated local time.

The NPRM proposed chart in Table C is based on the TNO Report. Upon a further review of the TNO Report, we believe the proposed Table C was oversimplified in two regards. The first was that many of the values were oversimplified following a rounding process that doesn't adequately represent the actual calculations used in the ARC process. The second oversimplification is the use of a standard 30-minute reduction for a nonacclimated crewmember. The end result is an improper application of a nonacclimated penalty for the operation planned. Additionally, just as is the case with the acclimated discussion, a table that reflects the true values is better suited to accurately reflect the appropriate reduction for the crewmember not being acclimated.

Additionally, the TNO Report is intended for single segment operation only and the addition of more than one additional segment would stray too far from the science on which the charts were developed. Multi-leg augmentation should only be allowed when no crew change is possible. Multi-leg augmentation should never be used solely for the purpose of extending a flight duty period. Augmented flights must not be mixed with non-augmented flights in the same flight duty period.

The proposed regulation (117.19 (c)(3)) provides for a two hour consecutive sleep opportunity for the flight crewmember manipulating the controls on landing. That sleep opportunity should be mandated for both required crewmembers at landing. Both crewmembers manipulate the controls, i.e., the non-flying pilot normally operates flaps, landing gear and radios and performs monitoring so he must be equally alert. This is especially important as augmentation has the potential to significantly increase time on task. The final segment of any augmented flight must provide the required rest. During the most challenging approaches on short final, both crewmembers are manipulating the controls and the manipulation of the flight controls transfers from one pilot to the other at about 300 feet. There are also other high workload circumstances where both pilots are manipulating the controls such as when a landing must be rejected or decision-making is required for diversion.

**117.21 Reserve Status**

Due to overly complex language, we propose to rewrite section **117.21(c)** as follows:

(c) For short call reserve,

(1) **The maximum reserve duty period for un-augmented operations is defined as:**

**Table E—Short Call Reserve Duty Period**

| Time of Start of RAP (Home Base or Acclimated Local Time) | Maximum Flight Reserve Duty Period (hours) Based on Number of Flight Segments | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7+ |
| 0000-0359 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 0400-0459 | 14 | 14 | 13 | 13 | 13 | 13 | 13 |
| 0500-0559 | 15 | 15 | 15 | 15 | 14 | 13.5 | 13 |
| 0600-0659 | 16 | 16 | 16 | 16 | 15 | 15 | 14.5 |
| 0700-1259 | 16 | 16 | 16 | 16 | 16 | 16 | 15 |
| 1300-1659 | 16 | 16 | 16 | 16 | 15.5 | 15 | 14.5 |
| 1700-2159 | 15 | 15 | 14 | 14 | 13.5 | 13 | 13 |
| 2200-2259 | 14.5 | 14.5 | 13.5 | 13.5 | 13 | 13 | 13 |
| 2300-2359 | 13.5 | 13.5 | 13 | 13 | 13 | 13 | 13 |

(3) **The maximum reserve duty period (to include phone availability and/or flight duty period assignments) is determined by the earlier end point of (a) the start of the RAP time plus value in Table E or (b) the Flight Duty Period limitation in Table B as measured from the FDP time of start (home base or acclimated local time).**

Note: For example: If the RAP started at 0100, crewmember called at 0115, show at 0300, then it would be the EARLIER FDP end time of:

(i) RAP start 0100 + 13 hours = 1400 FDP end

(ii) RAP start 0100 + 1307 hours (+ 7 minute WOCL adjustment) = 1407 FDP end

(iii) FDP start at 0300 + 9 hours FDP limit = 1200 FDP end

Rationale: This ensures that the reserve will NOT have an allowable FDP limit greater than the lineholder the reserve is paired with and does not impact the operator in any manner since the reserve and lineholder end point is the same.

(4) **If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the air carrier may increase the maximum reserve duty period in table E by one-half of the length of the time during the reserve availability period of 0000-0600 in which the air carrier did not contact the flightcrew member, not to exceed 3 hours; however, the maximum reserve duty period may not exceed 16 hours. If the flight crewmember is contacted for an assignment prior to 0000 hours the reserve duty period would not be extended.**

Note: For example, RAP starts at 2200 hours, pilot called at 0300 for flight assignment, the RAP may be extended by 1.5 hours. If the pilot was called prior to 0000 hours there would be no extension.

Rationale: The short call reserve section is complex and we are concerned that there will be misunderstanding by flight crewmembers, schedulers and management officials with the section as written. Consistent with other limitations in the proposal, we believe a chart is a better way to set forth the short call reserve limits expressed in the proposal. We urge that the chart that sets forth the short call reserve limits be adopted. In both the ARC and the NPRM preamble, the intent was expressed that RAP extension credit is to be made available for not contacting reserves between 0000 and 0600 whose RAP's touch that time period. However, the proposed language in 117.21(c)(4) (iv) and 117.21(c)(5)(iii) neglects this distinction, providing credit for *any* period of non-contact. This error in the language has been corrected in our revised language in (4) above.

(5) **No certificate holder may schedule and no reserve flightcrew member on short call reserve may accept an assignment of a flight duty period that begins before the flightcrew member's next reserve availability period unless the flightcrew member is given at least 14 hours rest. <u>This provision may be used only once in a rolling 168 hour period.</u>**

Rationale: The need for this provision is best illustrated by real world examples. A pilot is scheduled and adjusts his rest schedule for a series of RAPs beginning at 0400. If the operator contacts the pilot at 0600 (after the morning bank of departures) and releases the pilot for a 14 hour rest period, the pilot could then begin a RAP at 2000 to cover the late evening bank of

departures. The pilot could then be contacted at 2200 and released for another 14 hour rest period. This cycle could continue for an indefinite period. Our proposal aligns this section with the provision for shifting of a RAP in section (e). Without this provision there is essentially no difference between a short-call and long-call reserve removing all circadian protection afforded by having a RAP system in the first place.

**117.25 Rest**

The following changes are proposed:

**(d)(1) (*added*) An unacclimated flight crewmember shall be given at least 12 consecutive hours of rest beginning upon arrival at the rest facility before beginning a RAP or flight duty period.**

**(f) (*added*) No certificate holder may schedule and no flightcrew member may accept an assignment for reserve or a flight duty period after completion of any duty period(s) (flight or reserve) in a new theater unless the flightcrew member is given a rest period upon return to the flightcrew members home base location in accordance with Table F.**

**(f)(1)(*added*) The recovery rest in Table F satisfies the requirements for acclimation and the flight crewmember would then enter Table (B) without a penalty.**

**Table F – Number of Local Nights for Recovery on Return to Home Base**

| Elapsed Time Since Leaving Home base (h) | Maximum Time Difference from Home Base (h) | | | | | |
|---|---|---|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8-9 | 10-12+ |
| 60-84h | 1* | 2* | 2* | 2* | 2* | 3 |
| 84-108h | 2* | 2* | 3 | 3 | 3 | 3 |
| 108-132h | 3 | 3 | 3 | 3 | 3 | 3 |
| 132-156h | 3 | 3 | 3 | 3 | 3 | 3 |
| 156+h | 3 | 3 | 3 | 3 | 3 | 3 |

Note 1: The values in Table F refer to eastward transitions (eastward outbound/ westward homebound) only. * denotes that for westward transitions (westward outbound/eastward homebound) one extra day is required to be added to the value depicted.

> Note 2: When the elapsed time away from home base is less than 60 hours one local night's recovery rest should be provided on return to base, except when the returning flight duty period encroaches the WOCL, then an additional local nights rest will be added.

Rationale: A flight from the U.S. to Europe or Asia disrupts the circadian cycle and a rest of 9 hours is not sufficient to achieve an appropriate level of alertness. However, when flight crewmembers fly to a new theater they should be given at least 12 hours at a suitable accommodation between all duty periods until they become acclimated to the new theater in accordance with 117.25 or return to home base.

Where crew members are not acclimated, upon return to home base, a recovery period should be provided that ensures a crew member's body clock has recovered to home base local time before the start of the next duty. The time necessary to ensure complete recovery of the circadian rhythm varies as a function of the elapsed time away from home base and the maximum time difference from home base. Table F can be used to determine the number of local nights required to readapt within an hour of home base.

We also believe that there should be recovery rest for time away from home when operating flights in a different theater that is less than 168 hours away from home base. The current regulations provide for recovery rest in international operations for operations less than a 168 consecutive hours period. See 121.483, 485; 121.523, 525

We believe that this recovery rest is necessary to address cumulative fatigue, to provide circadian restabilization and to repay accumulated sleep debt. We therefore propose the recovery rest chart (Table F) be incorporated into the final rule.

**117.27 Consecutive Nighttime Operations**

We propose the following amendment:

No certificate holder may schedule and no flight crew member may accept more than three consecutive nighttime flight duty periods unless the certificate holder provides an opportunity to rest during the flight duty period in accordance with § 117.17.

**A fourth consecutive nighttime flight duty period may be assigned if the flight crewmember receives a minimum of 12 hours rest following each nighttime flight duty period.**

Rationale: Operational experience has shown over a period of years that overnight cargo airlines can assign up to four consecutive nighttime duty periods providing that flight crewmembers are given adequate rest between each consecutive duty period. If a crewmember is given a 12 consecutive hour rest break after each duty period, that will provide for an 8 hour rest opportunity and the cumulative sleep debt incurred will not be so excessive as to prevent a 4th consecutive nighttime FDP.