



REGIONAL AIRLINE ASSOCIATION

DOCKET NO. FAA 2009-1093

FLIGHTCREW MEMBER DUTY AND REST REQUIREMENTS NPRM

SUBMISSION OF COMMENTS

The member airlines of the Regional Airline Association (RAA) respectfully submit the following comments to Docket No. FAA 2009-1093 Flightcrew Member Duty and Rest Requirements. These comments result from our extensive collective review and careful consideration of the Preamble materials and the Proposed Amendment to Part 117- Flight and Duty Limitations and Rest Requirements: Flightcrew Members provided in the NPRM document.

In the interest of clarity, our comments are presented in the following order:

1. Introductory Remarks
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3. Broad Topics of RAA Member Airline Concern with the Proposed Amendment
4. Comments and Recommendations with Respect to Specific Provisions of the Proposed Amendment
5. Potential Future Applicability of the Proposed Amendment to Part 135 Operations
6. RAA Answers to Questions Posed in the NPRM Preamble Material

Introductory Remarks

The RAA member airlines fully support the aim of the Proposed Amendment “*to ensure that flightcrew members have the opportunity to obtain sufficient rest to perform their duties, with an objective of improving aviation safety.*” It was to this end and in support of this aim that the RAA member airlines actively participated in the deliberations of the Flight and Duty Time Limitations and Rest Requirements Aviation Rulemaking Committee (ARC) chartered by the FAA in June 2009.

In June 2009, even before the ARC's July 2009 first meeting, the RAA launched a program to study and recommend actions responsive to the regional airline industry's commitment to be at the forefront in efforts to continuously improve airline safety. It is important to note that two of the four elements of that RAA Strategic Safety Initiative (SSI) deal directly with the aim of the Proposed Amendment. Quoting from the RAA statement announcing the SSI:

- **Study Impact of Fatigue**

The Regional Airline Association will commission a study to look at the impact of fatigue and other human factors on flightcrew member performance. The study will be conducted by an independent and expert organization, in all likelihood a university with a respected aviation program. The study will be framed by a Strategic Safety Advisory Board comprised of industry experts drawn from the ranks of academia, industry, and safety regulators.

- **Fatigue Awareness Management Program**

The Regional Airline Association will create a fatigue awareness management program for use by its member airlines.

Both of these efforts are well underway. For over a year, the SSI program has included funding of an independent fatigue research project performed by Washington State University's Sleep and Performance Research Center and focused specifically on the multi-segment commercial airline operations that characterize regional airline operations, which have heretofore received little attention in fatigue research. This study, currently underway in the sleep lab at the Washington State University (WSU) Sleep and Performance Research Center, is scheduled to soon take the fruits of the lab-developed fatigue science into a full flight simulator evaluation involving actual regional airline flightcrew members and operations. With regard to the RAA's turning to WSU for the academic expertise to undertake the fatigue research part of our SSI program, it is worthy of note that one of the "*experts in sleep, fatigue, and human performance research*" invited by the FAA to brief the ARC on the very latest in fatigue science is Director of the WSU Sleep and Performance Research Center and the individual leading the important RAA SSI fatigue study is the Assistant Director of that Center. Some early findings coming out of WSU's work for the RAA are germane to the proposed new regulatory language and limitations and are presented in our discussion below with respect to the proposed § 117.15 regulatory language.

It should be clear from the above that the RAA member airlines support efforts to advance scientific understanding in the area of fatigue and also support the expanded application of that enhanced understanding to development of science-based fatigue risk management initiatives and to the promulgation of science-based regulations to mitigate fatigue.

RAA Member Airline Areas of Support for the Proposed Amendment

Before presenting both a significant number of wording changes that the RAA member airlines believe need to be made for the sake of clarity in the Proposed Amendment and some additional comments that raise our concerns with various regulatory directions being promulgated, the RAA member airlines would like to clearly state their support for several very important themes underlying the Proposed Amendment.

1. The RAA member airlines strongly support the statements made in the NPRM preamble regarding fatigue mitigation as a joint responsibility:

“B. Joint responsibility

Fatigue mitigation is a joint responsibility of the certificate holder and [of] the flightcrew member. Today’s proposal recognizes the need to hold both certificate holders and flightcrew members responsible for making sure flightcrew members are working a reasonable number of hours, getting sufficient sleep, and not reporting for flight duty in an unsafe condition.”

2. The RAA member airlines therefore strongly support fatigue training as probably the most important initiative in fatigue risk mitigation and therefore in reducing the potential impact of fatigue on airline safety. To properly respond to the joint responsibility described above, both flightcrew members and airline managers must be made fully knowledgeable in the science and implications of fatigue, how personal life decisions will affect an individual’s fatigue level, and the steps that can be taken to mitigate personal exposure to fatigue. Airline training programs need to impart that knowledge.
3. The RAA member airlines support continuation and even the expansion of non-punitive self-reporting programs with respect to fatigue (and to aviation safety issues in general) to ensure that flightcrew members have no reason/incentive to fly while fatigued. It has unfortunately become popular in the press and elsewhere to characterize such programs as being soft on enforcement, but non-punitive safety self-reporting systems are effective and critical to making further improvements in an already strong airline industry safety record.
4. The RAA member airlines further support establishment of proper boundaries for the scheduling of flightcrew members based on advances in fatigue science. To the extent that the science of fatigue is not yet completely clear (therefore our support for studies such as the RAA SSI impact of fatigue study), there will properly be discussion on what those boundaries should be, but it is long overdue that regulations and practice be grounded on available science rather than on supposition.

Broad Topics of RAA Member Airline Concern with the Proposed Amendment

Before beginning a section-by-section discussion of wording changes to the Proposed Amendment and other concerns that have been identified through reviews of the NPRM Preamble materials and the Proposed Amendment, there are several broad concerns with regard to the Proposed Amendment that the RAA member airlines would like to highlight:

1. The Number and Breadth of Comments that the RAA Member Airlines Find It Necessary to Make Regarding the Proposed Amendment Raises Questions Regarding the Appropriate Next Steps for this Regulation

As will quickly become apparent in reviewing the RAA member airlines comments, recommendations and answers to questions regarding this Proposed Amendment presented below, the issues that we raise are individually substantial and collectively cover nearly the full range of the proposed regulation and its conceptual underpinnings. While we have tried to present reasonable alternative processes and regulatory language addressing each of the concerns we raise, we remain unsure those concerns can be adequately resolved within the current NPRM process. We believe, however, that our proposed changes are the minimum required in order to create a rule that is effective regulation, grounded in science, and that is not unduly burdensome for RAA member airlines and to the traveling public.

The magnitude of the necessary changes that we see is beyond what we would have hoped for at the NPRM stage of the regulatory process, although we believe we understand why this might have happened. The time pressure that the ARC was under to analyze and deliberate the subject of flightcrew member duty and rest was substantial. An unfortunate result of that time pressure was there being neither sufficient time to properly vet the major issues of science and industry practice and impact relating to effective flightcrew member fatigue mitigation and scheduling nor time for proper consensus to be forged among the ARC members on those issues. Largely as a result of the absence of necessary time, no formal ARC report was produced to properly educate and guide the FAA rulemaking drafters in the many truly unique aspects of the science/pseudo-science of crew planning and scheduling in airline operations on which the proposed rule now impinges. Added to that, public pressure exerted through Congressional action, among other ways, forced the regulatory process to move ahead without the clarity necessary to effectively deal with the complex and interrelated issues of science and practice that are involved.

The RAA still hopes that the rule-making process initiated by the NPRM can lead to promulgation of an effective and proper science-based regulation governing flightcrew member duty and rest. We hope that our comments and

recommendations below point to a path by which the many deficiencies of the Proposed Amendment can be resolved to that end for the enhancement of flightcrew member fatigue mitigation and airline safety that all in the industry and government seek.

- However, should the FAA consider that the deficiencies outlined in these RAA member airline comments, and likely similarly outlined in the comments of other responding parties, require the proposed NPRM be rescinded and a Supplemental NPRM be developed and issued in its place, such action would have the support of the RAA.
- We think all parties would agree that an important present need exists for new regulation to enhance aviation safety by basing flightcrew member duty and rest requirements on the latest available fatigue mitigation science. As important as that need is, however, the RAA member airlines strongly believe that getting the regulation right is more important than getting it out quickly.¹

2. Two-Year Final Rule Effective Date Will Be An Issue For RAA Member Airlines

While the FAA's Response to Clarifying Questions document indicates that "*The FAA anticipates a final rule would become effective 2 years after publication*", it is not at all clear to the RAA member airlines, given the magnitude of the changes being proposed, that the complex process development, training, and system programming, testing and implementation that would be required to effect those changes can be properly accomplished in such a time period. It needs to be considered in setting an effective date for the Proposed Amendment that the issues brought into play by this rule go to the very heart of an airline's operation and directly and deeply impact more individual airline employees and processes than any other airline regulatory compliance area. The width and breadth of the changes and actions that will be required to implement those changes should not be minimized when considering an effective date for this Proposed Amendment.

3. Inadequate or Confusing Term and Process Definitions and Apparent Incomplete Understanding of Current Airline Operations Cause & Effect Relationships

It is unfortunately not clear from the way that many terms are used and a number of processes are detailed in the Proposed Amendment that the drafting team relied on a full understanding of the day-to-day realities, practicalities and performance inter-relationships inherent to part 121 airline operations. While the FAA Response to Clarifying Questions document provided answers to a number of our initial concerns in this regard, we nonetheless have additional questions that were only recognized after we had submitted our request for clarification:

¹ RAA endorses and incorporates by reference arguments regarding the legal flaws in the FAA's proposal stated in section IV of ATA's comments dated November 15, 2010 in this docket.

- Is there a regulatory distinction between the term “education” and the term “training” as used in §117.11 when referring to the requirements for a “fatigue education and training program”? Part 121 certificate holders generally provide “training” programs, not “education” programs, so is there a specific regulatory purpose for specifying “education” in the Proposed Amendment?
- In §117.9, what is the meaning of the term “adjust” and was this section written with an understanding that in typical part 121 carrier aircraft and crew schedule plans, “scheduled flight duty periods” already change on a monthly if not more frequent basis, tracking marketplace-driven changes to the flight schedule? How will an air carrier be expected to “adjust” for an “exceed [ance]” if the underlying scheduled flight duty periods are so subject to change from flight schedule to flight schedule that there most often is no stable base from which to “adjust”?
- Also with respect to §117.9, how was it determined that a 5 percent difference between actual flight duty periods and scheduled flight duty periods was an appropriate trigger to require an air carrier to “adjust” when, in the day-to-day airline world, that would seem to require an on-time zero flight arrival performance well above 90 percent, something that has not ever been accomplished in scheduled airline operations?

The point of this concern is that many of the specific directives in the Proposed Amendment do not appear to reflect sufficient understanding of the cause-effect relationships that abound in the day-to-day performance of an airline schedule. A better regulatory approach, in many cases, might be to simply specify achievable levels of operational performance an airline would be required to meet in a particular area, and leave the “how” of meeting that level of performance to the airlines.

4. The Layering of Unnecessary and Unnecessarily Duplicative Regulatory Restrictions

While establishing regulatory limits is certainly an important component in ensuring airline operational safety, the establishing too many regulatory limits and especially unnecessarily duplicative limits can have the opposite effect. Too tight a web of regulatory restrictions can all too easily so reduce the breadth of otherwise safety-enhancing alternatives available to airline management and individual flightcrew members alike in a changing operating environment that safety is reduced.

- Further, the sheer number of limits created by the Proposed Amendment and the heavy workload that a number of them will place on flightcrew members at precisely the time in flight when important decisions need to be made can lead to dangerous flightcrew member distraction and mental

fatigue at the least opportune time. The point where holding for weather versus diversion decisions need to be made is not a time for flightcrew members to be calculating their legality under multiple, often conflicting regulatory limitations.

An example of this is the way in which the Proposed Amendment creates unnecessary layers of essentially duplicative flightcrew member standards and limits regarding Flight Time (FT), Flight Duty Period (FDP) and Duty Period (DP). While compliance with only one layer of these proposed standards and limits would achieve the regulatory goal, requiring compliance with all of them in each case would be problematic for certificate holders and flightcrew members alike. This is most specifically found regarding inclusion of both FT and FDP limits in the regulation. The ARC essentially found that FT limits will not provide the fatigue risk mitigation required to ensure safety and turned to the much more productive alternative of FDP limits to achieve that goal. Yet the Proposed Amendment includes daily limits for both FDP and FT and cumulative limits for total FT, total FDP and total DP, with cumulative FT and FDP limits each specified for two different rolling time periods and cumulative DP limits specified for two separate types of DP and each of those specified for two different rolling time periods. That totals 10 separate time limits to which both the certificate holder and individual flightcrew members must manage their plans and schedules, clearly qualifying as a dictionary definition for “unnecessary and unnecessarily duplicative regulatory restrictions”.

As will be discussed in greater detail below, both daily and cumulative FT limits are unnecessary given the strong FDP and Rest Period limits established in the Proposed Amendment, while the need for cumulative DP limits is equally unclear. Even the drafters of the NPRM seem to have questioned the need for this type of piling on of nearly duplicative (but sufficiently different to require attention be paid to each of them individually) regulatory restrictions when they ask in question 12 of the NPRM preamble *“If the FAA adopts variable FDP limits, is there a continued need for daily flight time limits?”*

Beyond being unnecessary, having FDP, DP and FT regulatory limits in the new regulation places a significant burden on the airline (which has to weave its operating and staffing plans and operating day activities through all of these essentially competing but individually unique regulatory filters) and the flightcrew members who throughout the operating day will have to individually track personal compliance against each of these regulatory standards under their “joint responsibility” for managing their individual compliance with “fit to fly” regulations. The issues attendant to creating a successful intermix of aircraft, station gate and crew schedules are among the most complicated with which any airline or airline employee has to deal on both a planning and an operating day basis, so having to manage compliance with multiple, duplicative regulations in these areas is not helpful to safe, timely and compliant airline operations.

5. The FAA’s “Conservative” Approach to Limit Setting

As stated in the preamble to the NPRM:

“In June 2009, the FAA chartered the Flight and Duty Time Limitations and Rest Requirements Aviation Rulemaking Committee (ARC) comprised of labor, industry, and FAA representatives to develop recommendations for an FAA rule based on current fatigue science and a thorough review of international approaches to the issue. The FAA chartered the ARC to provide a forum for the U.S. aviation community to discuss current approaches to mitigate fatigue found in international standards and make recommendations on how the United States should modify its regulations.”

and

“To assist the ARC with its goal of developing proposed rules to enhance flightcrew member alertness and employ fatigue mitigation strategies, experts in sleep, fatigue, and human performance research presented a brief overview of the existing science and studies on sleep and fatigue to the ARC.”

and

“The ARC members considered the information presented by the scientists as well as other available scientific information and used their substantial operational experience knowledge base to develop the ARC proposals.”

and

“There are a number of standards addressing flight and duty time limitations and rest requirements that have been adopted by other jurisdictions, as well as the International Civil Aviation Organization (ICAO), and these standards were reviewed by the ARC to determine if any of their philosophy or structures could be adopted by the FAA.”

In an admittedly compressed period of time, the ARC absorbed all of the above science and international precedent and, in extensive group discussion, *“used their substantial operational experience knowledge base to develop the ARC proposals.”* Admittedly, the ARC was unable from their deliberations to reach a unanimous set of recommendations to the FAA, but that lack of unanimity cannot take away from the fact that the ARC held serious discussions, gave serious consideration to the important issues being deliberated, and developed substantial value in and support for each of the conclusions reached.

Which leads to the question of how the fruits of these ARC deliberations, including each of the two (and, in one area, three) competing ARC positions, have been reflected in the FAA decisions underlying the Proposed Amendment.

“The FAA has decided to propose the more conservative FDPs depicted in Table A(1)”

and

“The FAA recognizes that adopting the numbers in Table A(1) is a conservative approach. The FAA has decided to propose the more conservative numbers because it has little experience with this type of regulatory regime.”

and

“The FAA has decided to propose a variation of the more conservative maximum daily flight time limits for un-augmented operations in Table B(2).”

and

“Accordingly, the FAA believes it is appropriate to propose overall limits that are more conservative than those depicted in Tables B(1), B(3) and B(4).”

and

“Despite the lack of validated data, the FAA believes it is appropriate to take a conservative approach and is proposing to impose cumulative limitations on duty, flight duty periods, and flight time.”

While one can understand a tendency to opt for a conservative approach to rulemaking when entering an entirely new area of consideration, it’s hard to understand why the considerable science, international precedent and experience that the ARC members brought to bear in reaching their recommendations of fatigue risk mitigation strategies and regulatory protections should result in a Proposed Amendment that sets the new regulatory limits nearly across the board for each issue discussed at the most conservative of the ARC-submitted levels relating to that issue.

It also raises a further question as to whether the “conservative approach” taken in this regard might, in fact, be the most “un-conservative approach” with regard to the ability of the industry to absorb all of these new regulatory limitations into its operations. The Proposed Amendment rightfully sets important new requirements for fatigue training programs, for improvements in self- and company-oversight of company and flightcrew member practices with respect to fatigue, and for FAA

oversight of company identification and mitigation of fatigue-inducing situations in airline operations. It would seem that these new process and oversight standards would provide a sufficient level of comfort to allow setting at least some of the numerical limitations at levels above the minimum values coming out of the ARC deliberations – *i.e.* acceptance of the ARC Table A(2) FDP limits rather than the limits found in ARC Table A(1). (See discussion below.)

6. Future Regulatory and Process Uncertainty Regarding Fatigue Training and Fatigue Risk Management Programs

As stated above, the RAA member airlines fully agree that flightcrew member and airline management training in fatigue and fatigue risk mitigation strategies are of paramount importance to meeting the safety enhancement goals of the Proposed Amendment. What is nonetheless concerning is the manner in which expected future improvements in the understanding of fatigue are proposed to be accommodated in the regulation. In particular:

- Included in the requirements for a certificate holder’s fatigue training program in §117.11 is that such programs include “*NTSB recommendations on fatigue management*”. Does this, in effect, mean that certificate holders will be required to accept future regulatory direction in the area of fatigue from the NTSB?
- Both §117.7 and §117.11 include the following language: “*Whenever the Administrator finds that revisions are necessary for the continued adequacy of an FRMS [a fatigue education and training program] that has been granted final approval, the certificate holder must, after notification, make any changes in the program that are deemed necessary by the Administrator.*” Presumably, the intent of this language is to ensure that certificate holder programs keep pace with advances in fatigue science and fatigue mitigation research, but “*by the Administrator*” language typically gives authority to a certificate holder’s local FAA oversight office to direct change. Is this really what is intended or is it rather the intent to have any requirements for future program evolution determined on a national basis in a way that provides structured consideration of advances in fatigue science before directing their implementation?

7. Regulatory Mischaracterization or Mis-Consideration of What Are Truly “Unforeseeable Circumstances Beyond the Carrier’s Control”

Many of the discussions within the NPRM preamble material, within the FAA Response to Clarifying Questions document, and clearly underlying portions of the regulatory language within the Proposed Amendment exhibit a serious mis-consideration and mischaracterization of the concept of “*unforeseeable circumstances beyond the carrier’s control*” and how a certificate holder needs to

plan for/respond to such “*unforeseeable circumstances.*” This comes up in a number of ways and places, such as the following:

- *“In order to assure that the extensions are not abused and that carriers are not creating schedules contemplating circumstances that may be beyond their control, but that are reasonably foreseeable (e.g., seasonal weather trends, planned runway construction, chronically-delayed airports or markets) ...” [Preamble]*
- *“Thus, while the FAA contemplates that adverse weather could fit within that [those] criteria because it is beyond the control of the certificate holder, it would not always be considered unforeseeable.” [Preamble]*
- *“By the same token, carriers are not responsible for air traffic delays; however, if they are operating out of chronically delayed airports, air traffic delays are clearly foreseeable” [Preamble]*
- *“To the extent even small extensions are regularly occurring, the schedule reliability requirements discussed by the ARC should require schedule adjustments, even when the encroachments beyond the FDP table are very small.” [Preamble]*
- *“The FAA believes that the schedules for flight time should take into account circumstances that could reasonably arise during actual operations. For example, if the certificate holder is required to designate an alternate airport, it should assume that there is a chance the flight will have to be diverted to that airport.” [Response]*

The underlying message from the above statements and many like them throughout the NPRM preamble material seems to be that aircraft and crew schedules can and should be much more exact than they currently are and it is up to regulation to force the airlines to make them so. That is decidedly not the case on either count.

- While “*seasonal weather trends*” are “*reasonably foreseeable*” as a concept, knowledge of that concept is not the same as knowing two or three months in advance (because this is when the schedule planning starts) that the 3:00 pm flight on the 20th needs to be planned around the snowstorm that will ultimately sneak up on and shut down JFK (or maybe not).
- While “*air traffic delays are clearly foreseeable*” to those airlines “*operating out of chronically delayed airports*”, that does not provide an exact schedule planning data point for scheduling crews that will be operating flights into such an airport on the 25th of the month when winds force all flights to use the crosswind runway.

- Even when “*small extensions are regularly occurring*”, it may well not be at all necessary or constructive to “*require schedule adjustments, even when the encroachments beyond the FDP table are very small*” because, when those changes are implemented 60-90 days later, the conditions that caused them to be thought necessary may not be present in that later timeframe.
- The FAA Response to Clarifying Questions document language stating that “*if the certificate holder is required to designate an alternate airport, it should assume that there is a chance the flight will have to be diverted to that airport*” is anything but clarifying for someone planning an airline’s operation. How could an airline ever build a crew schedule months in advance that would reflect an interpretation that FDPs need to cover the possibility that a particular flight might need to divert on a given day?

The point of this concern is that aircraft and crew schedules are planned and put relatively in stone two or more months before their operation. Of necessity, they must be planned on the basis of the information available at that time. Seasonal trends will be covered as a concept, as will runway paving projects and projected gate constraints, and, and, and ... but that effort can only be based on the then best understanding of the trend line derived from history/experience relating to the period of time for which the schedule is being planned. When the day-of-operation for that plan finally arrives, the “*clearly foreseeable*” factors impacting an airline’s ability to exactly meet the plan will actually become data points scattered around what will become next year’s version of the trend line. Like as not, reality may be different than the plan every single day of that plan, with some days above and others below that line. Unfortunately, collecting all that data and basing changes 60-90 days later on it will likely not make performance versus plan much or at all better, and may make it worse, because the operation 60-90 days later will assuredly be under the influence of an entirely different place on the seasonal trend line.

What is the message to be taken from this concern? It’s not clear that the schedule reliability data collection and analysis mandated by the Proposed Amendment will produce any benefit to schedule and FDP reliability except in those very, very few cases when planners may completely misread available information in the first place.

Comments and Recommendations with Respect to Specific Provisions of the Proposed Amendment

Following extensive and careful review by the RAA member airlines, we offer the following comments and recommendations with respect to many of the individual provisions found in the Proposed Amendment. These comments and recommendations are presented in section-order rather than in order of the importance that we place on the comment and recommendation. For ease of understanding, all or appropriate portions of each section's Proposed Amendment language is presented in italics preceding the comments and recommendations relating to that section.

§ 117.1 Applicability.

“This part prescribes flight and duty limitations and rest requirements for all flightcrew members and certificate holders conducting operations under part 121 of this chapter. This part also applies to all flightcrew members and part 121 certificate holders when conducting flights under part 91 of this chapter.”

Comment: The application of §117 to “... *part 121 certificate holders when conducting flights under part 91 of this chapter*” is problematic because of the breadth of the requirement. While the answers to questions in this regard provided in the FAA Response to Clarifying Questions document responded to the uncertainty in the applicability of this proposal, it is requested that the intent be better reflected in the proposed language of this provision. Therefore, we offer the proposed language below.

Recommendation: Revise the regulatory language in this section to the following:

§ 117.1 Applicability.

This part prescribes flight and duty limitations and rest requirements for all flightcrew members and certificate holders conducting operations under part 121 of this chapter and for operations directed by the certificate holder under part 91 of this chapter.

§ 117.3 Definitions.

“Split duty means a flight duty period that has a scheduled break in duty that is less than a required rest period.”

Comment: As described above, this definition is not totally clear as, for example, it would seem to apply in cases such as when there is a three-hour break at an airport between scheduled flights.

Recommendation: Revise the definition of Split duty to the following:

§ 117.3 Definitions.

Split duty as used in § 117.17 means a flight duty period that has a scheduled break in duty in a suitable accommodation that is less than a required rest period.

§ 117.5 Fitness for duty.

“ (a) Each flightcrew member must report for any flight duty period rested and prepared to perform his or her assigned duties.

(b) No certificate holder may assign and no flightcrew member may accept assignment to a flight duty period if the flightcrew member has reported for a flight duty period too fatigued to safely perform his or her assigned duties or if the certificate holder believes that the flightcrew member is too fatigued to safely perform his or her assigned duties.

(c) No certificate holder may permit a flightcrew member to continue a flight duty period if the flightcrew member has reported himself too fatigued to continue the assigned flight duty period.

(d) Any person who suspects a flightcrew member of being too fatigued to perform his or her duties during flight must immediately report that information to the certificate holder.

(e) Once notified of possible flightcrew member fatigue, the certificate holder must evaluate the flightcrew member for fitness for duty. The evaluation must be conducted by a person trained in accordance with § 117.11 and must be completed before the flightcrew member begins or continues an FDP.

(f) As part of the dispatch or flight release, as applicable, each flightcrew member must affirmatively state he or she is fit for duty prior to commencing flight.

(g) Each certificate holder must develop and implement an internal evaluation and audit program approved by the Administrator that will monitor whether flightcrew members are reporting for FDPs fit for duty and correct any deficiencies.”

Comment: Restating from above, the RAA member airlines strongly support the statements made in the NPRM preamble regarding fatigue mitigation as a joint

responsibility and the codification of that joint responsibility in the regulatory language of this section. That being said, the RAA member airlines have several concerns with the regulatory requirements and language in this section and more particularly with the apparently expansive interpretation of that language found in Draft AC-120-FIT:

- There appears to be a significant difference between this part’s regulatory language stating that “*No certificate holder may assign ... a flight duty period ... [to a] flightcrew member ... if the certificate holder believes that the flightcrew member is too fatigued to safely perform his or her assigned duties*” and the language in draft AC 120-FIT stating “*Air carriers must assess the crewmember’s state when they report to work. If the air carrier determines a crewmember is too tired, it may not allow the crewmember to fly*” The former regulatory language suggests a certificate holder is responsible for taking action whenever questions are raised relative to the fatigue state of a flightcrew member in a particular circumstance, while the latter advisory language effectively mandates, in the extreme, that an air carrier must put each of its reporting flightcrew members through a formal fatigue-state evaluation program before allowing them to take their flights. The RAA member airlines fully support the appropriateness of the first quoted, proposed regulatory language above in this regard, but strongly disagree with the AC 120-FIT language as being divisive, expensive and civil liberties intrusive, as well as extremely complicated operationally.
 - Perhaps the long industry/regulatory history with regard to handling suspected alcohol abuse situations through the development of “reasonable cause” processes could be an effective approach with regard to fatigue, because the bold language of AC 120-FIT is simply unworkable as written.
 - While recommending current FAA-approved alcohol abuse “reasonable cause” processes as a possible template for development of comparable processes to evaluate flightcrew member “fatigue state”, we need also to point out that the science of fatigue does not currently provide a means for the performance of proper “fatigue state” evaluations in the field, and that no training is currently available or in development that would allow airline field staff to make such evaluations, even if they were to be supported by available science.
 - Ultimately, only the individual flightcrew member knows if and how they have obtained their required rest and whether they are truly fit for duty. Each certificate holder is appropriately responsible for ensuring that scheduled flight duty periods and flightcrew member assignments are constructed in accordance with all the regulatory limits that have been developed to prevent flightcrew member fatigue from impacting safety. It is the responsibility of each flightcrew member to report fit for duty or to

announce to airline management before starting an assignment if that is not the case.

- Changes to the proposed regulatory language of this section reflecting each certificate holder's responsibility regarding the planning of scheduled flight duty periods and flightcrew member assignments is presented below.
- Changes to the proposed regulatory language of this section reflecting the responsibility of each flightcrew member to announce to certificate holder management should they not be fit for duty are also presented below.
- The necessity and practicality of the regulatory language stating that "*As part of the dispatch or flight release, as applicable, each flightcrew member must affirmatively state he or she is fit for duty prior to commencing flight*" is also of concern. Although the FAA's Response to Clarifying Questions document responds to this concern as follows

"The expectation is that each flightcrew member would affirmatively state in the flight release or dispatch papers at the beginning of each flight segment within the FDP that he or she is fit for duty. Simply allowing the PIC to sign-off for the entire crew would allow individual flightcrew members to shirk their responsibility."

the RAA member airlines do not believe this new requirement provides any fatigue mitigation or personal responsibility benefit and instead seems to be a public relations "feel good" activity that would not be worth the added bother at the gate or in the cockpit.

Due in part to logistical issues at airport boarding gates, current practice is for the flightcrew member-in-command (Captain) to sign security releases confirming flightcrew member identities and that the aircraft has been security checked, fuel sheets and dispatch releases. To add a new requirement that each flightcrew member individually sign a statement attesting to their fitness for duty will add a new and unnecessary complexity to the current pre-departure boarding gate activities. Captains currently sign flight release documents (probably the most important documents attesting to the legality and safety of the ensuing flight) on behalf of their entire crew, so it's not clear what benefit or additional focus on safety is provided by requiring each flightcrew member to individually sign a statement of their fitness-for-duty, especially since it's a requirement of each flightcrew member's profession and FAA license that he/she be fit for duty.

- The RAA member airlines frankly regard the proposed requirement for individual signatures to be an unnecessary and logistically bothersome public perception activity that provides no benefit to fatigue risk

mitigation and below suggest alternate regulatory language that would require adding fitness for duty language to current flight release documents, that would be signed by the Captain attesting to the fitness for duty of all operating flightcrew members.

- The regulatory language stating that *“Each certificate holder must develop and implement an internal evaluation and audit program approved by the Administrator that will monitor whether flightcrew members are reporting for FDPs fit for duty and correct any deficiencies”* generated numerous questions and concerns among RAA member airlines until posting in the NPRM Docket of the FAA Response to Clarifying Questions document.
 - The interpretive statement in that document stating that *“The proposed evaluation and audit requirements are intended to provide certificate holders with historical data that they can use to identify potential problems that lead to excessive incidents of fatigue. As stated in the preamble, the “program would look at both the number of instances in which [flightcrew members report fatigued] as well as the reasons contributing to the problem.” 75 FR 55858. Since the program looks at historical data, there is no expectation that the evaluation be made every time a flightcrew member self-reports as fatigued or is evaluated for fatigue”* provided important clarification and bounding of the intent of the regulatory language.
- However, the following language from the FAA Response to Clarifying Questions document gives RAA member airlines great concern because of its expansiveness, its lack of grounding in the realities of a certificate holder’s ability and right to know of and control flightcrew member personal lives and activities when not “at work”, and inappropriate certificate holder management entry into these contentious areas of civil liberty and employment law without legal authority. The apparent responsibility being assigned to the certificate holder through the advisory language below represents an impossibility for the certificate holder with regard to planning and day-to-day operations:
 - *“Regardless of whether the flightcrew members live at their home domicile or in a different theater, the certificate holder is expected to calculate the typical length of time it would take the flightcrew member to return home, just as it would be required to calculate the typical length of time it would take to get a flightcrew member to a hotel. Since transportation can never be considered rest, certificate holders need to have some cognizance of where their flightcrew members live and whether they are likely to be resting in a hotel or at home.”*

As is restated below, it is the position of the RAA member airlines that personal commuting practice is and must remain a flightcrew member responsibility tied to each flightcrew member’s responsibility to be fit for duty for every FDP to which

they are assigned, a position that would seem to agree with the sentence that concludes the paragraph in the FAA Response to Clarifying Questions document from which the above language was quoted:

- *“Obviously the certificate holder cannot control for every circumstance ... the flightcrew member would bear responsibility for assuring that he or she could get the requisite rest opportunity.”*
- A further concern in this area arises from not knowing the FAA’s future compliance expectations with respect to major parts of draft AC 120-FIT on the subject of both flightcrew member commuting and the internal evaluation and audit program requirement in this section. AC 120-FIT raises the same significant RAA member airline concerns with regard to potential use of the Proposed Amendment regulatory language to deeply involve certificate holders in the lifestyle and commuting practices of their flightcrew members that are discussed above relating the FAA Response to Clarifying Questions document.
 - When speaking with respect to certificate holders’ use of findings resulting from the fatigue internal evaluation and audit program required by this section, AC 120-FIT states *“An air carrier will need to take steps to correct any fatigue problem. For example, if the air carrier became aware that crewmembers were commuting during their windows of circadian low, the air carrier could require that all crewmembers spend the night within the local commuting area prior to starting a series of flight duty periods.”*
 - AC 120-FIT further devotes 6 of its 14 pages to the subject of commuting, the reasons for commuting, the stresses that might result from commuting and suggested relationships between commuting and fatigue.
 - All of this information is certainly grist for the mill in developing a certificate holder’s fatigue training program and providing the fatigue information to flightcrew members that will allow them to act responsibly with regard to controlling and reacting to their own fatigue state. That being said, it is the position of the RAA member airlines that personal commuting practice is a flightcrew member responsibility and is tied to a flightcrew member’s responsibility to be fit for duty for every FDP to which they are assigned.

Recommendation: The RAA member airlines recommend the following:

- That the responsibility of each certificate holder to ensure that scheduled flight duty periods and flightcrew member assignments are constructed in accordance with the regulatory limits that have been developed to prevent fatigue from impacting safety; and

- That current FAA “reasonable cause” regulation language and processes with regard to alcohol abuse be used as the basis for revision to the regulatory language of this section and for the processes discussed in AC 120-FIT regarding responsibility for fitness for duty and the processes that are required should a question arise regarding flightcrew member fitness for duty; and
- That section 5(a) of AC 120-FIT be revised so that the discussion regarding air carrier responsibility to “*assess the crewmember’s [fatigue] state*” is made consistent with the regulatory language in this section and with the statements made in the FAA Response to Clarifying Questions document with regard to that language; and
- That the requirement of proposed subsection (f) of this section for each flightcrew member to attest to his/her being fit-for duty by individually entering their signature to that effect on “*the dispatch or flight release*” be replaced with the requirement that the flightcrew member-in-command sign such a statement on behalf of his/her crew; and
- Revise the regulatory language of this section to read as follows:

§ 117.5 Fitness for duty.

(a) Each flightcrew member must report for any flight duty period rested and prepared to perform his or her assigned duties.

(b) Each certificate holder must ensure that scheduled flight duty periods and flightcrew member assignments are constructed in accordance with the regulatory limits of this rule.

(c) No certificate holder may assign and no flightcrew member may accept assignment to a flight duty period if the flightcrew member has reported for a flight duty period too fatigued to safely perform his or her assigned duties or if the certificate holder believes that the flightcrew member is too fatigued to safely perform his or her assigned duties.

(d) No certificate holder may permit a flightcrew member to continue a flight duty period if the flightcrew member has reported himself too fatigued to continue the assigned flight duty period.

(e) Any person who suspects a flightcrew member of being too fatigued to perform his or her duties during flight must immediately report that information to the certificate holder.

(f) Once notified of possible flightcrew member fatigue, the certificate holder must evaluate the flightcrew member for fitness for duty. The evaluation must be conducted by a person trained in accordance with § 117.11 and must be completed before the flightcrew member begins or continues an FDP.

(g) Each certificate holder must include a statement as a part of every dispatch or flight release, as applicable, affirmatively stating that each flightcrew member operating that flight is fit for duty, which affirmation shall be attested to by

the signature of the flightcrew member-in-command of that flight on that dispatch or flight release, as applicable.

(h) Each certificate holder must develop and implement an internal evaluation and audit program approved by the Administrator that will monitor whether flightcrew members are reporting for FDPs fit for duty and correct any deficiencies.”

§ 117.7 Fatigue risk management system.

“ (a) No certificate holder may exceed any provision of this part unless approved by the FAA under a Fatigue Risk Management System that provides at least an equivalent level of protection against fatigue-related accidents or incidents as the other provisions of this part.

(b) The Fatigue Risk Management System must include:

(1) A fatigue risk management policy.

(2) An education and awareness training program.

(3) A fatigue reporting system.

(4) A system for monitoring flightcrew fatigue.

(5) An incident reporting process.

(6) A performance evaluation.

(c) Whenever the Administrator finds that revisions are necessary for the continued adequacy of an FRMS that has been granted final approval, the certificate holder must, after notification, make any changes in the program deemed necessary by the Administrator.”

Comment: The RAA member airlines support the evolution toward Fatigue Risk Management Systems (FRMS) and believe that the Fatigue Risk Management Plan (FRMP) documents that each RAA member airline has submitted to the FAA attest to that support. We further believe that these FRMP documents provide the basis for development of sound FRMSs should any carrier choose that route to compliance as offered by the Proposed Amendment.

However, as will be expressed again below with respect to § 117.11, the RAA member airlines find the regulatory language in both this section and § 117.11 defining the manner in which air carrier fatigue programs will need to be updated as advances are made in the understanding of fatigue and fatigue risk management to be problematic and unnecessary.

- The language of §117.7(c) stating that “*the certificate holder must, after notification, make any changes in the program that are deemed necessary by the Administrator*”, as traditionally understood in FAA field offices, would open the door for changes directed at an airline’s FRMS program from any number of individuals in those field offices, without standardization and coordination among those directives and at the risk of creating confusion in the important fatigue risk

mitigation programs, messages and strategies that are sought through this regulation.

- It is, however, recognized that any FRMS will need to be updated periodically to incorporate new science or advances regarding fatigue risk management that provide substantive improvement in aviation safety. However the proposed §117.7 (c) language attempts to provide the opportunity for future rule changes without the need for writing a future rule. The usual regulatory process has been to incorporate new science or advances regarding a program such as FRMS into the Advisory Circular (AC) associated with that program, where it can be presented as a new best practice. If, in the future the FAA views that a necessary FRMS change cannot be accommodated through an AC change, then the FAA should propose such change in a future rule.

The RAA member airlines also believe that the approval of FRMS programs can best be accomplished via the same Operations Specification authority that was established for each airline's recently filed FRMP. This approach, via the current language of §119.51 Amending operations specifications, provides an alternative regulatory method by which to ensure that both FRMP and FRMS programs remain consistent with each other and current with the growth in fatigue knowledge and fatigue mitigation best practice. This makes both § 117.7(c) and § 117.11(c) language unnecessary.

- We therefore request that §117.7(c) be deleted from the Proposed Amendment language since it is redundant to the authority already provided to the FAA under §119.51, Amending operations specifications. That existing §119.51 language gives the FAA authority to initiate immediate certificate holder action “*with respect to safety in air transportation or air commerce*”, which is certainly applicable to ensuring desired changes are made to an airlines FRMP or FRMS.
- We also view the §117.7 (c) proposed language to be unnecessarily more stringent than the §119.51 regulation. If the FAA believes that additional authority is needed to change a certificate holders FRMS, then the FAA should propose a revision to the Part 119.51 rule.

Recommendation: That the §117.7(c) regulatory language be deleted in its entirety.

§ 117.7 Fatigue risk management system.

(a) No certificate holder may exceed any provision of this part unless approved by the FAA under a Fatigue Risk Management System that provides at least an equivalent level of protection against fatigue-related accidents or incidents as the other provisions of this part.

(b) The Fatigue Risk Management System must include:

- (1) A fatigue risk management policy.**
- (2) An education and awareness training program.**
- (3) A fatigue reporting system.**

- (4) A system for monitoring flightcrew fatigue.
- (5) An incident reporting process.
- (6) A performance evaluation.
- (c) [Deleted in it its entirety]

§ 117.9 Schedule reliability.

“ (a) Each certificate holder must adjust within 60 days —

- (1) Its system-wide flight duty periods if the total actual flight duty periods exceed the scheduled flight duty periods more than 5 percent of the time, and
- (2) Any scheduled flight duty period that is shown to actually exceed the schedule 20 percent of the time.

(b) Each certificate holder must submit a report detailing the scheduling reliability adjustments required in paragraph (a) of this section to the FAA every two months detailing both overall schedule reliability and pairing-specific reliability. Submissions must consist of:

- (1) The carrier’s entire crew pairing schedule for the previous 2-month period, including the total anticipated length of each set of crew pairings and the regulatory limit on such pairings;
- (2) The actual length of each set of crew pairings, and
- (3) The percentage of discrepancy between the two data sets on both a cumulative, and a pairing-specific basis.”

Comment: Before offering recommendations with respect to the specific §117.9 Proposed Amendment language, it is necessary to first comment on several important differences in language and apparent intent found among the various discussions of the proposed schedule reliability rules in the NPRM.

There are unfortunately seriously confusing differences between the language in the NPRM preamble explaining the proposed rule (Excerpt 1 below), the language in the preamble submitted to the Office of Management and Budget (Excerpt 2 below) and the proposed rule itself (presented above). Specifically:

- The NPRM preamble defines the criterion for reporting schedule reliability to be the percentage of times that actual FDPs exceed the values in Table B of the Proposed Amendment;
- Whereas the preamble submitted to the Office of Management and Budget targets comparison of actual versus scheduled FDPs rather than actual FDPs versus Table B FDP limits.
- Beyond even that, this latter preamble, in stating “*If the air carrier’s system-wide actual FDPs exceed the scheduled flight [duty periods] by more than five (5) percent or any actual FDP [~~that~~] exceeds the pairing-specific schedule by more*

than twenty (20) percent” would lead one to believe that the criterion is a percentage based on the difference in time length between actual and scheduled FDPs, not a percentage based on the frequency of actual FDPs exceeding scheduled FDPs.

- And to top it off, the Proposed Amendment language makes no mention at all of Table B as a point for comparison.

The FAA acknowledged this confusion in their recently posted [FAA Response to Clarifying Questions](#) document and presumably is editing the regulatory language to resolve it, but there are several more serious flaws underlying the regulatory concept specified in the Proposed Amendment that need to be discussed. Simply stated, the regulatory construct and trigger points bear little relationship to the realities of day-to-day airline operations. In DOT reporting parlance, the comparisons that the Proposed Amendment language would direct certificate holders to make between planned and actual FDP times are directly analogous to the regular reports of “on-time zero” flight arrival performance that airlines are required to make to the DOT. FDPs will clearly not end “on time” if the aircraft operated by flightcrew members working those duty periods do not arrive on time. Against this reality, the Proposed Amendment’s schedule reliability regulatory construct would appear to be based on an expectation that all flights are or should be scheduled to arrive exactly on schedule every flight.

- There is no mention in the preamble discussions regarding schedule reliability of anything akin to the 14-minute grace period that the DOT has established for the public reporting of airline on-time arrival statistics;
- There is no discussion or statistical basis/reality check presented for selection of a 5 percent FDP “late arrival” rate for the certificate holder’s operation as a whole as the trigger point where rescheduling action by the certificate holder will be required to *“adjust within 60 days its system-wide flight duty periods ...”*
- Nor is there any discussion of a statistical basis/reality check for the selection of a 20 percent “late arrival” of a particular FDP as the trigger point requiring action by the certificate holder regarding that particular FDP.
- The only reference point mentioned in the NPRM preamble was in a discussion of the EU OPS subpart Q regulation wherein it was stated that, under subpart Q, *“Certificate holders must take action to revise a schedule in cases where the actual operation exceeds the maximum scheduled FDP on more than 33 percent of the flights in that schedule during a specified period of time.”* This directive is most analogous to the situation for which the Proposed Amendment would establish a 5 percent trigger point, but no explanation has been provided that would explain the significant difference between 5 percent and 33 percent.

That the § 117.9 language may have been drafted in expectation that all flights are or should be scheduled to arrive exactly on schedule every flight is given support by the

following quote from NPRM preamble Extract 1 below, stating “*Air carriers build flight schedules projected to meet the constraints of individual FDP.*” Actually, airlines do not build flight schedules to meet the constraints of individual FDPs. Airlines first build aircraft flight schedules that they believe will best serve their passengers’ desires and then build flightcrew member FDPs that both permit economic operation of those aircraft schedules and provide sufficient “cushion” within the regulatory FDP limits to ensure that the normally occurring day-to-day variances between actual and planned aircraft schedules and actual and planned FDPs will not result in either non-compliance with a regulation or disruption of an aircraft flight schedule. The schedule design standard is not and cannot be that every flight arrives on time every time – there is too much inherent day-to-day variation of all manner of factors for that ever to be possible.

This raises the question of whether 5 percent and 20 percent are appropriate trigger points for the Proposed Amendment’s requirement for formal schedule reliability reporting and schedule change. The question might best be considered in the context of historical airline on-time arrival statistics reported for the US airline industry. The official source for such information is the DOT Bureau of Transportation Statistics. The DOT BTS Transportation Annual Statistics Report for 2008, the latest such annual report available, provides the following:

Table 3-1-2 in this report (see next page) provides major U.S. Airline On-Time Performance statistics for the 12-year period 1995-2007, reporting that:

- Only twice in that period have major U.S. airline schedules achieved an on-time arrivals percentage above 80 percent;
- For the other ten years of the period, the on-time arrivals percentage remained in the upper-middle 70 percent range;
- It also should be noted that these statistics categorizes all flights arriving between 0 and 14 minutes late as on-time arrivals.

TABLE 3-1-2 Major U.S. Air Carrier On-Time Performance: 1995–2007
Thousands of flights

	Late departures	Late arrivals	Cancellations	Diversions	On-time flight arrivals (%)	Total operations
1995	828	1,039	92	10	78.6	5,327
1996	974	1,220	129	14	74.5	5,352
1997	847	1,084	98	12	77.9	5,412
1998	870	1,070	145	13	77.2	5,385
1999	937	1,153	154	14	76.1	5,528
2000	1,132	1,356	187	14	72.6	5,683
2001	954	1,104	231	13	77.4	5,968
2002	717	868	65	8	82.1	5,271
2003	834	1,058	101	11	82.0	6,489
2004	1,188	1,421	128	14	78.1	7,129
2005	1,279	1,466	134	14	77.4	7,141
2006	1,425	1,616	122	16	75.4	7,142
2007	1,572	1,803	161	17	73.4	7,453

NOTES: *Late departures* are flights departing 15 minutes or more after the scheduled departure time. *Late arrivals* are flights arriving 15 minutes or more after the scheduled arrival time. Late departures and arrivals are strongly seasonal and are affected by weather in winter and summer months and by heavy demand in summer. *Cancellations* are flights that were not operated, but were listed in a carrier's computer reservation system within seven calendar days of the scheduled departure. *Diversions* are flights that left from the scheduled departure airport, but flew to a non-destination point. Diverted flights may or may not ultimately reach their scheduled destination.

In 2006 and 2007, 20 air carriers reported on-time performance data, including all major U.S. passenger carriers (carriers with at least one percent of total domestic scheduled-service passenger revenues) and other carriers that reported voluntarily. The number of carriers reporting in previous years is as follows: 2005 (20); 2004 (19); 2003 (18); 2002 (10); 2001 (12); 2000 (11); 1999 (10); 1998 (10); 1997 (10); 1996 (10); and 1995 (10).

Since a flight duty period cannot end until the aircraft arrives at its destination, there is limited likelihood that the flightcrew member FDP reliability analysis gathered under the proposed § 117.9 language will differ greatly from an airline's on-time arrival statistics, even if the Proposed Amendment regulatory language is changed to reflect a 14-minute "grace period" such as the DOT affords in its on-time reporting statistics.

There are also concerns with the underlying logic of this rule. There seems to be a regulatory assumption underlying the proposed language that pairings and flight duty periods repeat. While some do, the very large majority do not. With current flight schedules that vary by day, a given pairing or flight duty period will often not operate on a consistent-enough basis to allow for meaningful tracking. Terminology confusion is also an issue in the proposed language. In (a) the regulation language refers to flight duty periods while in (b) the regulation language requires air carriers to report on pairing reliability. Which one is correct? Are "flight duty period" and "pairing" being used here interchangeably?

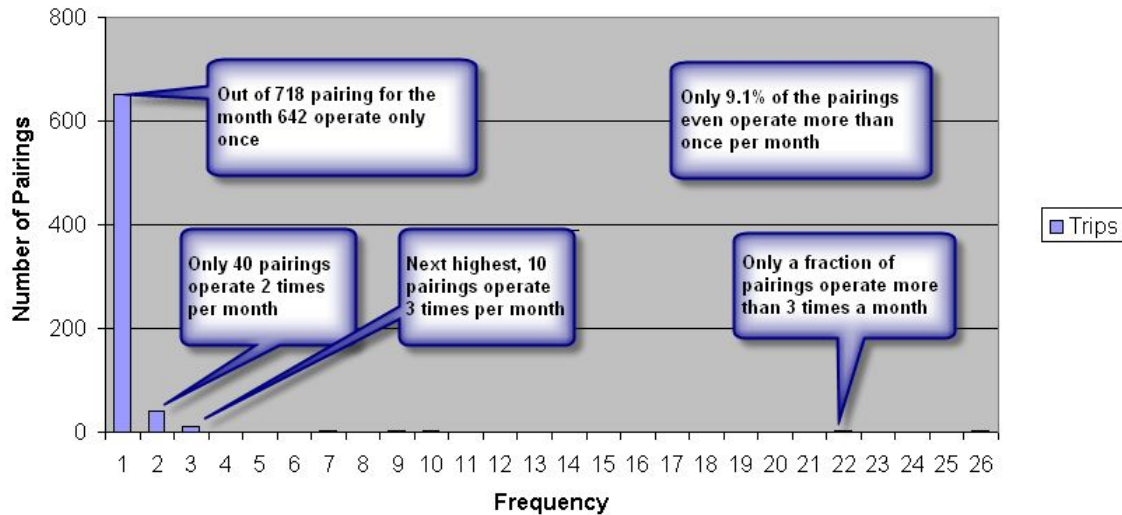
There is an apparent assumption underlying this section of the Proposed Amendment that there is a "sameness" or repeatability among flightcrew member pairings and among flight duty periods in a given month and also repeatability of both across adjacent months. If that were the case, only then would the tracking and analysis directives laid down in the regulatory language of this section make some semblance of sense. That critical assumption, however, upon which all else in this section of the Proposed Amendment rests, is readily debunked by looking at typical regional airline crew schedules.

The repeatability of typical airline crew pairings in a given month is less than minimal:

- The Pairing Frequency chart below details the frequency of repeated pairings in the November 2010 flight schedule for a typical RAA member airline. This airline operates 36 Embraer 175 aircraft in a mix of hub feed and point-to-point domestic services for a major U.S. airline.
- As the chart shows, the November 2010 crew schedule involves 718 crew pairings:
 - 652 of those pairings, representing 90.8% of all pairings, only operate a single time in November
 - 40 pairings, representing 5.6% of all pairings, only operate twice in November
 - 10 pairings, representing 1.4% of all pairings, only operate three times in November
 - Message – 96.4% of this typical airline's crew pairings repeat two or less times in November

Note that November is a “normally expected” month with respect to crew pairings for this certificate holder.

Pairing Frequency (repeating pairings)



There is a bit more repeatability of typical airline FDPs in a given month than there is of crew pairings, but that repeatability is still minimal in the context of what would be required for the tracking and analysis directives of this section to provide any meaningful fatigue mitigation benefit. Based on October 2010 flight schedules, the two FDP Frequency charts below detail the frequency of repeated FDPs for the typical RAA member airline cited above and for a second RAA member airline operating 73 CRJ-family aircraft, also in a mix of hub feed and point-to-point domestic services for a major U.S. airline.

- As the chart for the first airline shows, the October 2010 crew schedule included the assignment of crews to 1,704 FDPs:
 - 211 of the FDPs assigned, representing 12.4% of all FDPs assigned, were scheduled only a single time in October
 - Another 509 of the FDPs assigned, representing 29.9% of all FDPs assigned, were scheduled between 2 and 5 times in October
 - Message – Fully 58.7% of this typical airline’s assigned FDPs in October repeated ten or less times during the month

October 2010 System Pairing Data

<u>Duty Period Occurrences</u>	<u>Duty Period Repetitions</u>	<u>Duty Periods</u>	<u>Percent of Total DPs</u>	<u>Cumulative Total Percent</u>
211	1	211	12.4%	12.4%
41	2	82	4.8%	17.2%
58	3	174	10.2%	27.4%
47	4	188	11.0%	38.4%
13	5	65	3.8%	42.3%
8	6	48	2.8%	45.1%
8	7	56	3.3%	48.4%
11	8	88	5.2%	53.5%
1	9	9	0.5%	54.0%
8	10	80	4.7%	58.7%
2	11	22	1.3%	60.0%
8	12	96	5.6%	65.7%
3	13	39	2.3%	68.0%
6	14	84	4.9%	72.9%
5	15	75	4.4%	77.3%
6	16	96	5.6%	82.9%
3	17	51	3.0%	85.9%
1	18	18	1.1%	87.0%
1	19	19	1.1%	88.1%
2	20	40	2.3%	90.4%
3	21	63	3.7%	94.1%
1	22	22	1.3%	95.4%
1	24	24	1.4%	96.8%
1	26	26	1.5%	98.4%
1	28	28	1.6%	100.0%
Total Duty Periods		1704		

- The chart for the second airline shows even less repeatability. The October 2010 crew schedule for this airline included the assignment of crews to 4,660 FDPs:
 - 1,301 of the FDPs assigned, representing 27.9% of all FDPs assigned, were scheduled only a single time in October
 - Another 1,563 of the FDPs assigned, representing 33.5% of all FDPs assigned, were scheduled between 2 and 5 times in October
 - Message – Fully 76.4% of this typical airline’s assigned FDPs in October repeated ten or less times in the month

October 2010 System Pairing Data

<u>Duty Period Occurrences</u>	<u>Duty Period Repetitions</u>	<u>Duty Periods</u>	<u>Percent of Total DPs</u>	<u>Cumulative Total Percent</u>
1301	1	1301	27.9%	27.9%
273	2	546	11.7%	39.6%
154	3	462	9.9%	49.5%
65	4	260	5.6%	55.1%
59	5	295	6.3%	61.5%
28	6	168	3.6%	65.1%
25	7	175	3.8%	68.8%
17	8	136	2.9%	71.7%
14	9	126	2.7%	74.4%
9	10	90	1.9%	76.4%
10	11	110	2.4%	78.7%
11	12	132	2.8%	81.6%
8	13	104	2.2%	83.8%
3	14	42	0.9%	84.7%
7	15	105	2.3%	87.0%
7	16	112	2.4%	89.4%
8	17	136	2.9%	92.3%
4	18	72	1.5%	93.8%
5	19	95	2.0%	95.9%
3	20	60	1.3%	97.1%
2	21	42	0.9%	98.0%
3	22	66	1.4%	99.5%
1	25	25	0.5%	100.0%
Total Duty Periods		4660		

This significant lack of repeatability both of crew pairings (less than minimal repeatability) and of FDPs (minimal repeatability) within a crew scheduling month comes as no surprise to RAA member airline crew scheduling professionals. Development of both crew pairings and the FDPs that make up those pairings has for quite some time been accomplished using increasingly modern and efficient crew scheduling optimization computer software systems. With regulatory and contractual limitations and restrictions deeply engrained into their software, these systems run for hours to grind out the most manpower and cost efficient FDPs and crew pairings possible. No longer is the design of crew schedules limited to day-to-day sameness (and reduced flightcrew member utilization) by the unaided individual crew scheduler's limited capacity to effectively deal with a large number of pattern differences. Due in large part to the use of such

optimization software systems, made necessary by the size, complexity, geographic spread, and month-to-month variability of typical regional airline flight schedules, the repeatability of crew pairings and FDPs required for the Proposed Amendment language in this section to produce fatigue mitigation value simply no longer exists.

Applying the schedule reliability data collection and analysis requirements specified in §117.9 to the crew pairings or the FDPs of today's typical RAA member airline would place a massive clerical requirement on the scheduling staff of such airline and produce neither meaningful data nor any meaningful insights and direction toward a reduction in flightcrew member fatigue. As an example, analysis of the "schedule reliability" of each of the 90.8% of the first of the above certificate holders' pairings that operate only a single time in November 2010 can produce one of only two possible statistics for each individual pairing – 100% reliability or 0% reliability. Neither is meaningful.

There is also a significant question regarding proper identification of the duty periods to be compared to actual – are they the bid packet duty periods? Or is it the duty period as planned at the beginning of the day? Or, instead, is it the most recently modified duty period? All are reasonable possibilities. Pairings and duty periods are regularly modified for many valid reasons and at many times between the date that the bid package is sent out and the start of a duty period. Some of these modifications may be crew-initiated and most will not exacerbate fatigue. To a lesser but significant extent, duty periods can be modified after a flightcrew member begins his flight duty period, i.e. mechanical or operational issues, employee illness, unforeseen weather conditions, ATC and unexpected airport delays, to name a few. Some examples might be:

- Example 1– Duty period CVG-DCA-CVG-DTW starts in CVG at 1200 and is scheduled to terminate in DTW at 2000. It is modified to operate CVG-DCA-CVG-MSP with a scheduled arrival of 2110. The flight from CVG-MSP arrives on time at 2100
- Example 2 – Duty period CVG-DCA-CVG-DTW starts in CVG at 1200 and is scheduled to terminate in DTW at 2000. The aircraft experiences an unforeseen operational delay on the DCA-CVG leg, (could be weather, maintenance, passenger situation). This delay carries through to the last leg, which arrives in DTW at 2045.
- Example 3 – Duty period CVG-DCA-CVG-DTW starts in CVG at 1200 and is scheduled to terminate in DTW at 2000. The aircraft experiences an unforeseen operational delay on the CVG-DTW leg. This causes an arrival in DTW at 2045.

None of these represent a regulatory compliance issue. None of these have any particular influence on fatigue. Yet all of these would have to be reported as if they involved something wrong and correctable.

Beyond even the serious conceptual issues presented above, there are other, more mundane considerations that further lead one to seriously question the fatigue

identification and mitigation value of the Proposed Amendment’s schedule reliability concept. Scheduled FDPs are necessarily designed to accommodate “normally expected” unexpected delays without breaking regulatory scheduling limits. While this is responsible planning, under the proposed regulation as written, such “normally expected” actual-versus-plan FDP exceedances would have to be reported as if they were something that should not have happened despite their being a perfectly normal result of day-to-day variances in “normally expected” factors such as weather, ATC congestion and the like.

Recommendation: It should be clear from the extensive discussion above that there are a great many unresolved issues with respect to the Proposed Amendment language dealing with schedule reliability, importantly including there being no apparent tie between the schedule reliability regulatory language and the processes necessary for advancing fatigue mitigation. The issues are so numerous and several of them are so deep that the RAA member airlines are certain that the processes envisaged by the currently proposed § 117.9 regulatory language would be completely ineffectual in providing meaningful input to identification of the kinds of purported fatigue and fatigue mitigation issues for which they proposed. As our review of this section finds it to be totally unworkable for the task it is meant to accomplish, it should be removed from the Proposed Amendment.

§ 117.9 Schedule reliability – [deleted in its entirety]

Excerpt 1: Preamble Page 35 (Explanation of the proposed rule)

“ Under today’s proposal, carriers must first demonstrate that 100 percent of the scheduled crew pairings fall within the limits in the FDP table. Actual system-wide FDPs should not exceed the maximum levels in the FDP table more than five percent of the time. Each crew pairing would need to fall within the FDP table 80 percent of the time. The agency believes a 20 percent variation for a specific crew pairing provides carriers with sufficient flexibility to address multiple yet small excursions beyond the FDP table, while still forcing the carriers to recognize when a particular crew pairing is problematic. Because no flightcrew member may exceed the limits in the FDP table beyond 30 minutes more than once in any 168-hour period, the FAA does not believe a 20 percent variation will result in any immediate adverse safety situation.

Should any of the three proposed reporting requirements be exceeded, a carrier would be required to readjust the problematic crew pairings to more realistic schedules.”

Excerpt 2: Preamble Page 116 (Paperwork Reduction Act - notification to the Office of Management and Budget of proposed data collection.)

“ Use of: Maintaining schedule reliability is a critical element to fatigue mitigation. Air carriers build flight schedules projected to meet the constraints of individual FDP. If, however, actual flight time exceeds the projected (scheduled) flight time, the validity of the air carrier’s scheduling process may come into question. This proposal places

accountability upon each air carrier with regard to their scheduling practices and provides a means for the FAA to oversee the reliability of air carrier's scheduling process relative to the flightcrew members actual FDP as opposed to the flightcrew member's scheduled FDP.

The proposal defines a flight duty period as a period that begins when a flightcrew member is require[d] to report for duty that includes a flight, a series of flights, or positioning flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flightcrew member. If the air carrier's system-wide actual FDPs exceed the scheduled flight [duty periods] by more than five (5) percent or any actual FDP [~~that~~] exceeds the pairing-specific schedule by more than twenty (20) percent, the air carrier will be required to make adjustments to its schedule factoring in the actual time exceeded in order to reflect a more realistic schedule based upon actual data. Under the proposal, each air carrier must make scheduling reliability adjustments to its schedule any time the aforementioned limitations have been exceeded. Additionally, each air carrier must submit an ongoing report on 2-month intervals detailing its overall schedule reliability and pairing-specific reliability.”

§ 117.11 Fatigue education and training program.

“ (a) *Each certificate holder must develop and implement an education and training program, approved by the Administrator, applicable to all employees of the certificate holder responsible for administering the provisions of this rule including flightcrew members, dispatchers, individuals involved in the scheduling of flightcrew members, individuals involved in operational control, and any employee providing management oversight of those areas.*

(b)(1) Initial training for all individuals listed in paragraph (a) of this section must consist of at least 5 programmed hours of instruction in the subjects listed in paragraph (b)(3) of this section.

(2) Recurrent training for all individuals listed in paragraph (a) of this section must be given on an annual basis and must consist of 2 programmed hours of instruction in the subjects listed in paragraph (b)(3) of this section.

(3) The fatigue education and training program must include information on—
(i) FAA regulatory requirements for flight, duty and rest and NTSB recommendations on fatigue management.

(ii) Basics of fatigue, including sleep fundamentals and circadian rhythms.

(iii) Causes of fatigue, including possible medical conditions.

(iv) Effect of fatigue on performance.

(v) Fatigue countermeasures.

(vi) Fatigue prevention and mitigation.

(vii) Influence of lifestyle, including nutrition, exercise, and family life, on fatigue.

(viii) Familiarity with sleep disorders and their possible treatments.

(ix) Responsible commuting.

(x) Flightcrew member responsibility for ensuring adequate rest and fitness for duty.

(xi) Operating through and within multiple time zones.

(c) Whenever the Administrator finds that revisions are necessary for the continued adequacy of a fatigue education and training program that has been granted final approval, the certificate holder must, after notification, make any changes in the program that are deemed necessary by the Administrator.

Comment: Restating from above, the RAA member airlines strongly support fatigue training as probably the most important initiative in fatigue risk mitigation and therefore in reducing the potential impact of fatigue on airline safety. In order to properly respond to the joint responsibility described above, both flightcrew members and airline managers must be made fully knowledgeable in the science and implications of fatigue, how personal life decisions will affect an individual's fatigue level, and the steps that can be taken to mitigate personal exposure to fatigue. Airline training programs need to impart that knowledge. That being said, the RAA member airlines have several concerns with the regulatory requirements and language in this section:

- This section is titled “Fatigue education and training program” yet there is no agreed regulatory interpretation of exactly what comprises “education.” Training, however, is a well understood term meaning “organized activity aimed at imparting information in or instructions to improve the recipient’s performance or to help him or her to attain a required level of knowledge or skill” – “fatigue training program” would seem to be the appropriate term for this section.
- Instructional time requirements are, by their very nature, problematic in the development of effective training programs – they can either act to stifle training content (“we’ve got our required hours, so that’s enough content”) or can create training pabulum to fill the time slot (“what can we put in the last hour that the program is required to have?”). Fatigue training programs should be judged on their content and delivery methods, not against essentially arbitrary time standards.
 - Under both ATOS and modern teaching techniques, setting a standard of hours has been replaced with the need to produce “outcomes” in training. We would encourage the FAA to specify such outcomes and not focus on hours, which often produce the negative results discussed above without achieving the desired goal.
- The formal regulatory requirement to include “NTSB recommendations on fatigue management” is an open-ended requirement that inappropriately brings the NTSB into the FAA’s regulatory space – while NTSB recommendations might well be important to advancing fatigue risk management practices, from a regulatory standpoint, these should flow through an FAA process and not be required by regulation to be implemented based on NTSB action without prior FAA review and direction.

The desire expressed in this section that fatigue training programs be regularly updated as advances are made in the understanding of fatigue and fatigue risk management is supported by the RAA member airlines, but, as extensively discussed above with regard to § 117.7, the regulatory language proposed for this to be accomplished is problematic and unnecessary.

- The language of §117.11(c) stating that “*the certificate holder must, after notification, make any changes in the program that are deemed necessary by the Administrator*”, as traditionally understood in FAA field offices, would open the door for changes directed at an airline’s fatigue training program from any number of individuals in those field offices, without standardization and coordination among those directives and at the risk of creating confusion in the important fatigue risk mitigation programs, messages and strategies that are sought through this regulation.
- It is, however, recognized that any fatigue training program will need to be updated periodically to incorporate new science or advances regarding fatigue risk management that provide substantive improvement in aviation safety. However the proposed §117.11 (c) language attempts to provide the opportunity for future rule changes without the need for writing a future rule. The usual regulatory process has been to incorporate new science or advances regarding a program such as fatigue training into the Advisory Circular (AC) associated with that program, where it can be presented as a new best practice. If, in the future the FAA views that a necessary fatigue training program change cannot be accommodated through an AC change, then the FAA should propose such change in a future rule.

The RAA member airlines also believe that the approval of fatigue training programs can best be accomplished via the same Operations Specification authority that was established for each airline’s recently filed FRMP. This approach, via the current language of §119.51 Amending operations specifications, provides an alternative regulatory approach by which to ensure that a both certificate holder’s fatigue training program and FRMP (which already includes their fatigue training program, making questionable the regulatory need for any of the language in §117.11) remain consistent with each other and current with the growth in fatigue knowledge and fatigue mitigation best practice. This Op Spec approach makes the proposed § 117.11(c) language unnecessary.

- We therefore request that §117.11(c) be deleted from the Proposed Amendment language since it is redundant to the authority already provided to the FAA under §119.51, Amending operations specifications. That existing §119.51 language gives the FAA authority to initiate immediate certificate holder action “*with respect to safety in air transportation or air commerce*”, which process is certainly applicable to ensuring desired changes are made to an airlines fatigue training program.

- We also view the §117.11 (c) proposed language to be unnecessarily more stringent than the §119.51 regulation. If the FAA believes that additional authority is needed to change a certificate holder’s fatigue training program, then the FAA should propose a revision to the Part 119.51 rule.

Recommendation: Revise the regulatory language in this section to the following:

§ 117.11 Fatigue education and training program.

(a) Each certificate holder must develop and implement a training program, approved by the Administrator, applicable to all employees of the certificate holder responsible for administering the provisions of this rule including flightcrew members, dispatchers, individuals involved in the scheduling of flightcrew members, and their direct supervisors.

(b)(1) Initial training for all individuals listed in paragraph (a) of this section must include, at a minimum, the subjects listed in paragraph (b)(3) of this section.

(2) Recurrent training must be given on an annual basis for all individuals listed in paragraph (a) of this section and must include, at a minimum, the subjects listed in paragraph (b)(3) of this section.

(3) The fatigue training program must include information on—

(i) FAA regulatory requirements for flight, duty and rest.

(ii) Basics of fatigue, including sleep fundamentals and circadian rhythms.

(iii) Causes of fatigue, including possible medical conditions.

(iv) Effect of fatigue on performance.

(v) Fatigue countermeasures.

(vi) Fatigue prevention and mitigation.

(vii) Influence of lifestyle, including nutrition, exercise, and family life, on fatigue.

(viii) Familiarity with sleep disorders and their possible treatments.

(ix) Responsible commuting.

(x) Flightcrew member responsibility for ensuring adequate rest and fitness for duty.

(xi) Operating through and within multiple time zones.

(c) [Deleted in its entirety]

§ 117.13 Flight time limitation.

“ 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 flightcrew.

(b) Will exceed 16 hours if the operation is conducted with an augmented flightcrew”

Comment: In the preamble to the Proposed Amendment, the FAA states that:

“Initial ARC discussion of FDPs assumed that, as in the case of CAP-371 and the EASA regulations, there would be no daily limit on flight time. Instead flight time would effectively be limited to approximately 2 hours less than the FDP because FDP assumes a flightcrew member will report for duty an hour and a half before flying and will spend approximately 30 minutes after completing all flying for the day completing paperwork.”

The FAA then raises a concern that *“the maximum amount of time flying during the middle of the day could increase from the current 8 hours to as much as 11 hours, almost a 50% increase”* in a regulatory regime limiting maximum FDP but having no maximum FT limit.

- The NPRM Preamble materials present no experience or scientific data to indicate that such an increase would be a bad or good thing, or would impact safety in any way.
- The NPRM Preamble statement regarding *“almost a 50% increase”* in time flying is also a bit misleading, as the actual percentage increase in going from 8 hours to 11 hours is 37.5%, mathematically well less than *“almost a 50% increase.”*
- The RAA member airlines finds nothing in science or experience that would lead them to be concerned with the potential for flight hour increases of this limited magnitude (which would only occur during a portion of the day and then only on single-leg pairings), especially under a new regulatory regime based on FDP limits rather than FT limits.

The ARC obviously resolved any concerns of science or experience that they may have had in this regard by noting in their deliberations that FTs are directly related to and a subset of FDPs and therefore are indirectly and effectively controlled by the FDP limits included in the Proposed Amendment. The international regulatory community seems also to have resolved any concerns that they might have had in this regard as witnessed by the absence of FT limits in both CAP-371 and EASA regulations.

The RAA member airlines therefore strongly believe that limitations on flight time of any kind (daily or cumulative over any timeframe) are unnecessary for the assurance of safety and fatigue mitigation in airline operations and should be removed from the Proposed Amendment. Just because a new regulatory regime results in a relaxation of one or more of the limits proscribed by the previous regulatory regime does not make the new regime ineffective and require the old regime to be superimposed on top of the new regime in the absence of any facts supporting that duplication.

- FT limitations are essentially duplicative of the FDP limitations in the Proposed Amendment, which limitations have RAA member airline support;

- No scientific support has been presented for an FT requirement as an addition to the proposed FDP limitations (indeed, quite the opposite may be the case, as indicated by the following quote from the NPRM preamble – “...it may be possible to demonstrate that longer flight times will not adversely affect safety”);
- The international regulatory community regulations upon which the ARC charter and much of the ARC deliberations were based have found no need for such limitations; and

As discussed above, the sheer number (8) of regulatory limitations that will need to be tracked on an operating-day basis both by the certificate holder and by each individual flightcrew member is mind-numbing (see Item 2 under Broad Topics of RAA Member Airline Concern with the Proposed Amendment above).

- This latter point is particularly important, as not all flightcrew members have the necessary sophistication or always have the time available to calculate and track all of the proposed parameters and make a proper and timely compliance decision before departing on their last flight of the day. With reserves not being available at every station on an airline’s route map and given that they may not be available at all times during the day even at cities where reserves are normally staffed, the opportunity for severe disruption to operations on a weather-impacted operating day is significant.

The RAA member airlines therefore respectfully submit that, in the absence of both an international regulatory case and a scientifically supportable case for FT limitations, and given the necessary compliance process impact that such limitations will have on the certificate holder and on each individual flightcrew member, all FT limitation language should be removed from the Proposed Amendment.

Recommendation: The following:

§ 117.13 Flight time limitation – [Deleted in its entirety]

§ 117.15 Flight duty period: Un-augmented operations.

“ (a) *Except as provided for in § 117.17, no certificate holder may assign and no flightcrew member may accept an assignment for an unaugmented flight operation if the scheduled flight duty period will exceed the limits in Table B of this part.*

(b) *If the flightcrew member is not acclimated:*

(1) *The maximum flight duty period in Table B of this part is reduced by 30 minutes.*

(2) *The applicable flight duty period is based on the local time at the flightcrew member’s home base.*

(c) *In the event unforeseen circumstances arise:*

(1) The flightcrew member in command and certificate holder may extend a flight duty period up to 2 hours.

(2) An extension in the flight duty period exceeding 30 minutes may occur only once in any 168 consecutive hour period, and never on consecutive days.”

Comment: As noted in the NPRM preamble material, it is generally accepted that the flight duty periods (FDP), regardless of tasks that they might include beyond the performance of actual flight segments, are the principal contributors to fatigue among airline flightcrew members. While rest “*in a suitable accommodation*” mitigates fatigue (and other activities such as transportation to/from a hotel do not), the flight duties performed during an FDP are the underlying cause of fatigue. As such, the RAA member airlines endorse FDP limits as a reasonable and sufficient regulatory control for the prevention and mitigation of flightcrew member fatigue. It is also intuitive that there is likely correlation between the number of flight segments flown during an FDP and the level of fatigue that a flightcrew member will experience, although the exact science for that relationship remains under research.

Based on the above, RAA member airlines endorse the concept of FDP limits as the logical centerpiece for any regulation designed to prevent and mitigate flightcrew member fatigue. As stated in our Introductory Remarks above, the RAA also endorses efforts to develop and learn from the latest in scientific research into fatigue and its effects on flightcrew member performance to ensure that regulatory limits that might be promulgated have sound scientific underpinnings. It was to this end that the RAA Strategic Safety Initiative launched in June 2009 included funding support for the Washington State University Sleep and Performance Research Center research into flightcrew member fatigue and specifically on the correlation between flightcrew member fatigue states and segments flown.

- It is important to note with regard to RAA funding of this research that the WSU team of scientists solely control of their studies and experimentation and are exclusively responsible for the results that their efforts produce. There is no RAA bias involved in these studies, the results of which will be presented in respected scientific forums and journals. The RAA’s role is solely that of a seeker after scientific truth and wisdom through its contributions in support of the WSU research regarding flightcrew member fatigue.

The quote below from the Regional Airline Association Fatigue and Performance Study, Phase 1 Final Report, 2010 July 31 submitted to the RAA by WSU describes the state of aviation fatigue science at the point that the RAA contracted with WSU and the level of science that the RAA sought to achieve by funding WSU’s efforts.

“With the arrival of airplanes capable of flying ultra-long-range (ULR) distances, new hours of service regulations have been needed to deal with greater-than-16-hour flight durations. As part of its 2009 rule-making activity, the Federal Aviation Administration (FAA) sought to make use of the science of sleep and fatigue to account for the effects of sleep restriction and circadian rhythm on

performance and safety. During the ensuing discussions of the Flight and Duty Time Limitations and Rest Requirements Aviation Rulemaking Committee (ARC), mathematical models of fatigue and performance (Van Dongen, 2004) were introduced to evaluate existing and hypothetical flight schedules. Model-based comparisons of predicted fatigue were made between ULR flights and long haul flights – which are broadly considered to be historically safe – to inform the rule-making process. This has been an important step toward acceptance of model-based fatigue risk management systems in U.S. commercial aviation.

Following the Colgan Air flight 3407 accident, attention began to shift from ULR flights to short haul (commuter) flights. A concern was raised that the multiple take-offs and landings associated with typical Regional Airline short haul flight schedules would result in workload-related fatigue, making such flight schedules potentially less safe than long haul operations. However, whereas the effects of sleep loss and circadian rhythm on performance and safety are well documented and understood (Åkerstedt, 2003; Van Dongen & Dinges, 2005), little is known about how these effects interact with workload (Van Dongen et al., 2010). To date, only one laboratory experiment has systematically investigated this issue (Van Dongen et al., 2005), and extant mathematical models of fatigue and performance (Mallis et al., 2004) do not yet account for workload. **Thus, there is a need to develop a scientific basis for comparing fatigue in Regional Airline flight schedules with fatigue in (historically safe) long haul flights. The Regional Airlines Association (RAA) seeks to address this issue [emphasis added].**”

With publication of the instant NPRM, the RAA asked the WSU research team to apply the advanced mathematical modeling that WSU developed in response to the above Statement of Work (see emphasized portion above) to a review of the Proposed Amendment’s FDP limits. In particular, the WSU researchers were asked to test the Proposed Amendment Table B FDP limits against the somewhat less restrictive Table A(2) limits generally proposed by the air carrier participants in the Flight and Duty Time Limitations and Rest Requirements ARC. The methodology for and results from that comparative analysis, taken from the Executive Summary of the WSU Sleep and Performance Research Center report dated November 8, 2010 and titled Maximum Flight Duty Periods: A Comparison of the FAA Proposal with the ARC Recommendations based on Mathematical Modeling of Fatigue – Peter McCauley PhD and Hans P.A. Van Dongen PHD, are presented below:

“The Regional Airline Association (RAA) asked Washington State University (WSU) to address the following two questions:

- 1) Using the expanded capabilities of the mathematical fatigue and performance modeling developed in Phase 1 of WSU’s project for the RAA, determine if

the predicted highest fatigue level for pilots is consistent when comparing the Aviation Rulemaking Committee (ARC) recommended maximum Flight Duty Period (FDP) with the Federal Aviation Administration (FAA) proposed maximum FDP, when they are not the same.

- 2) Determine if the results are comparable when using a validated fatigue model such as SAFTE.

Using the RAA model developed in Phase 1 of WSU's project for the RAA, which accounts for workload from multiple take-offs and landings, we predicted fatigue profiles across the maximum FDPs indicated in Table 1 [see below], which displays the ARC's recommended maximum FDPs and, where not the same, the FAA's proposed maximum FDPs. Only the 42 scenarios for which the FAA's proposed maximum FDP differed from the ARC's original recommendation were considered. For each comparison, the highest level of fatigue predicted across the period between first take-off and last landing for the FAA's proposed maximum FDP was determined, and compared to the highest level of fatigue predicted across the period between first take-off and last landing for the ARC's originally recommended maximum FDP. If the highest predicted fatigue for the ARC's recommended maximum FDP did not exceed that identified for the FAA's proposed maximum FDP, then it was concluded that the FAA's deviation from the ARC's recommendation may be overly restrictive with respect to predicted fatigue. Table 2 [see below] shows for which cells of Table 1, the FAA's proposed maximum FDP was predicted to be overly restrictive compared to the ARC's recommended maximum FDP on the basis of the RAA model developed in Phase 1. This was the case for 11 of the 42 cells considered. In addition, in 5 cases the ARC's recommendation was actually more restrictive (shorter maximum FDP) than the maximum FDP proposed by the FAA.

The RAA model developed in Phase 1 encompasses the latest science of sleep and fatigue, but has yet to be validated in simulator- or field-based studies. Therefore, the model-based analyses were repeated using the SAFTE model. This model does not account for workload from multiple take-offs and landings, but is considered a standard in several operational environments including parts of aviation. Table 3 [see below] shows for which cells of Table 1, the FAA's proposed maximum FDP was predicted to be overly restrictive compared to the ARC's recommended maximum FDP on the basis of SAFTE model predictions. This was the case for 29 of the 42 cells considered.

The results in Table 3 are consistent with those in Table 2 – in the sense that all of the cases where the FAA's proposed maximum FDP was found to be overly restrictive when taking into account workload from multiple segments using the RAA model developed in Phase 1, were also found to be overly restrictive using the SAFTE model (which does not account for workload). As such, there is converging evidence from two mathematical models instantiating the science of sleep and fatigue that some of the FAA's proposed maximum FDP adjustments relative to the ARC's original recommendations may be overly restrictive, as indicated in Table 2. Further, there is

converging evidence from these models that for the cases where the ARC's original recommendations were more restrictive (i.e., shorter maximum FDP) than the FAA's proposed maximum FDPs, the ARC's recommendations may have been comparatively too restrictive, as also indicated in Table 2.

No analyses were performed to directly compare predictions for different start times and/or different numbers of flight segments – comparisons were only made within table cells comparing the ARC's original recommendation to the FAA's proposed maximum FDP for the same start time and same number of segments. It should also be noted that the modeling results pertain strictly to the predicted fatigue aspect of the proposed maximum FDPs; information on other potentially relevant factors (e.g., traffic density, visibility, weather) was not available to us and could therefore not be accounted for.”

TABLE 1: MAXIMUM FLIGHT DUTY PERIODS. This table identifies maximum FDPs recommended by the ARC.³ The numbers in parentheses (red) show the FAA's proposed⁴ maximum FDP where deviating from the ARC's recommendation.

Time of Start (Home Base)	1 Flight Segment	2	3	4	5	6	7+
0000-0059	9	9	9	9	9	9	9
0100-0159	9	9	9	9	9	9	9
0200-0259	10 (9)	10 (9)	10 (9)	10 (9)	9	9	9
0300-0359	10 (9)	10 (9)	10 (9)	10 (9)	9	9	9
0400-0459	10	10	10 (9)	10 (9)	9	9	9
0500-0559	12 (11)	12 (11)	12 (11)	12 (11)	11.5 (10)	11 (9.5)	10.5 (9)
0600-0659	12	12	12	12	11.5	11	10.5
0700-0759	13	13	13	13	12.5	12	11.5 (11)
0800-0859	13	13	13	13	12.5	12	11.5 (11)
0900-0959	13	13	13	13	12.5	12	11.5 (11)
1000-1059	13	13	13	13	12.5	12	11.5 (11)
1100-1159	13	13	13	13	12.5	12	11.5 (11)
1200-1259	13	13	13	13	12.5	12	11.5 (11)
1300-1359	12	12	12	12	11.5	11	10.5
1400-1459	12	12	12	12	11.5	11	10.5
1500-1559	12	12	12	12	11.5	11	10.5
1600-1659	12	12	12	12	11.5	11	10.5
1700-1759	11	11	11 (10)	11 (10)	9 (9.5)	9	9
1800-1859	11	11	11 (10)	11 (10)	9 (9.5)	9	9
1900-1959	11	11	11 (10)	11 (10)	9 (9.5)	9	9
2000-2059	11	11	11 (10)	11 (10)	9 (9.5)	9	9
2100-2159	11	11	11 (10)	11 (10)	9 (9.5)	9	9
2200-2259	10.5	10.5	10.5 (9.5)	10.5 (9.5)	9	9	9
2300-2359	9.5	9.5	9.5 (9)	9.5 (9)	9	9	9

³ In June 2009, the FAA chartered the Flight and Duty Time Limitations and Rest Requirements Aviation Rulemaking Committee (ARC). On September 9, 2009, the ARC delivered its recommendations to the FAA in the form of a draft Notice of Proposed Rulemaking (NPRM).

⁴ The FAA published its recommended maximum flight duty limits in the Flightcrew Member Flight and Rest Requirements NPRM on September 14, 2010.

TABLE 2: COMPARISONS OF MAXIMUM FLIGHT DUTY PERIODS USING THE RAA MODEL DEVELOPED IN PHASE 1. The numbers in parentheses show the FAA’s proposed maximum FDP when it deviates from the ARC’s original recommendation; cells where there is no difference are not filled. Light green colored cells indicate instances where the FAA’s proposed maximum FDP was predicted to be overly restrictive compared to the ARC’s original recommendation in terms of modeled fatigue. Dark green colored cells indicate cases where the highest predicted fatigue during the ARC’s recommended maximum FDP marginally exceeded that predicted for the FAA’s proposed maximum FDP due to the difference in placement of the take-offs and landings in the modeling; however, predicted fatigue declined towards the end of the duty period, and thus the FAA’s proposed maximum FDP was predicted to be overly restrictive compared to the ARC’s original recommendation as well. Yellow colored cells indicate instances where the ARC’s original recommendation was predicted to be an improvement and is already (and arguable unnecessarily) more restrictive (shorter maximum FDP) than the FAA’s proposed maximum FDP.

Time of Start (Home Base)	1 Flight Segment	2	3	4	5	6	7+
0000-0059							
0100-0159							
0200-0259	10 (9)	10 (9)	10 (9)	10 (9)			
0300-0359	10 (9)	10 (9)	10 (9)	10 (9)			
0400-0459			10 (9)	10 (9)			
0500-0559	12 (11)	12 (11)	12 (11)	12 (11)	11.5 (10)	11 (9.5)	10.5 (9)
0600-0659							
0700-0759							11.5 (11)
0800-0859							11.5 (11)
0900-0959							11.5 (11)
1000-1059							11.5 (11)
1100-1159							11.5 (11)
1200-1259							11.5 (11)
1300-1359							
1400-1459							
1500-1559							
1600-1659							
1700-1759			11 (10)	11 (10)	9 (9.5)		
1800-1859			11 (10)	11 (10)	9 (9.5)		
1900-1959			11 (10)	11 (10)	9 (9.5)		
2000-2059			11 (10)	11 (10)	9 (9.5)		
2100-2159			11 (10)	11 (10)	9 (9.5)		
2200-2259			10.5 (9.5)	10.5 (9.5)			
2300-2359			9.5 (9)	9.5 (9)			

TABLE 3: COMPARISONS OF MAXIMUM FLIGHT DUTY PERIODS USING THE SAFTE MODEL. The numbers in parentheses show the FAA’s proposed maximum FDP when it deviates from the ARC’s original recommendation; cells where there is no difference are not filled. Green colored cells indicate instances where the FAA’s proposed maximum FDP was predicted to be overly restrictive compared to the ARC’s original recommendation in terms of modeled effectiveness. Yellow colored cells indicate instances where the ARC’s original recommendation was predicted to be an improvement and is already (and arguable unnecessarily) more restrictive (shorter maximum FDP) than the FAA’s proposed maximum FDP.

Time of Start (Home Base)	1 Flight Segment	2	3	4	5	6	7+
0000-0059							
0100-0159							
0200-0259	10 (9)	10 (9)	10 (9)	10 (9)			
0300-0359	10 (9)	10 (9)	10 (9)	10 (9)			
0400-0459			10 (9)	10 (9)			
0500-0559	12 (11)	12 (11)	12 (11)	12 (11)	11.5 (10)	11 (9.5)	10.5 (9)
0600-0659							
0700-0759							11.5 (11)
0800-0859							11.5 (11)
0900-0959							11.5 (11)
1000-1059							11.5 (11)
1100-1159							11.5 (11)
1200-1259							11.5 (11)
1300-1359							
1400-1459							
1500-1559							
1600-1659							
1700-1759			11 (10)	11 (10)	9 (9.5)		
1800-1859			11 (10)	11 (10)	9 (9.5)		
1900-1959			11 (10)	11 (10)	9 (9.5)		
2000-2059			11 (10)	11 (10)	9 (9.5)		
2100-2159			11 (10)	11 (10)	9 (9.5)		
2200-2259			10.5 (9.5)	10.5 (9.5)			
2300-2359			9.5 (9)	9.5 (9)			

The mathematical models and processes that WSU employed in the above analysis were developed during Phase 1 of the RAA SSI fatigue research project, based on research that WSU fatigue scientists have accomplished in similar fatigue research studies unrelated to aviation. The next step in the RAA SSI fatigue research project will be for WSU fatigue scientists to validate the mathematical models in a series of tests in RAA member airline flight simulators using RAA member airline flightcrew members as test subjects. Although that validation has not yet occurred, both the WSU Phase 1 mathematical modeling and the SAFTE model indicate large areas of time where the Table B limits in the Proposed Amendment are unnecessarily restrictive relative to the Table A(2) limits submitted by the ARC.

- Supporting the validity of such modeling techniques is the following footnote from the NPRM Preamble material:

“Bio-mathematical modeling of fatigue and performance can assist in providing objective metrics, which are conspicuously lacking in fatigue science. The rationale for modeling is that conditions that lead to fatigue are well known. A model simulates specific conditions and determines if fatigue could be present. Models can estimate degradations in performance and provide an estimate of schedule-induced fatigue risk that considers many dynamically changing and interacting fatigue factors.”

In keeping with the above indicated strong RAA member airline support of science-based regulations in the area of fatigue, the RAA member airlines recommend that the Proposed Amendment Table B maximum FDP limits in the 1400 – 1059 timeframe for every flight segment column and in the 1700 through 2159 timeframe for the 5 flight segments column be revised to reflect the Table A(2) limits proposed for those timeframes/segment columns by the ARC. Such revision is supported both by the WSU research dealing specifically with multi-segment flight operations detailed above and by the less specific SAFTE analysis that WSU performed to test the conclusions of their more rigorous mathematical modeling.

While accepting the (a) and (b) regulatory language of this section, the RAA member airlines find the (c)(1) and (c)(2) language to be unclear in many regards:

- Upon first read, the (c)(1) regulatory language statement that *“The flightcrew member in command and the certificate holder may extend a flight duty period by up to 2 hours”* is unclear as to whether such FDP extensions could be decided by either the flightcrew member-in-command or the certificate holder acting individually or whether a joint decision is required. That confusion was clarified on one level by the following passage from the FAA Response to Clarifying Questions document

“As discussed in the preamble to the NPRM, all extensions for unforeseen operational circumstances would be based on joint decision of the PIC and the certificate holder. The extension would be available, subject to the restrictions on the number of times it could be invoked, for any of the certificate holder’s

operations. This joint responsibility should assure that the decision whether to extend is based on the ability of the crew to safely continue the flight and the business needs of the certificate holder. It cannot be an arbitrary decision by either party, and safety of flight must be the primary consideration.”

However, while that clarification establishes the end state of the process leading to a recovery action plan decision “*in the event unforeseen circumstances arise,*” the Proposed Amendment language still exhibits confusion regarding the order of involvement of the certificate holder and the affected flightcrew members during the process leading up to that decision. Most certificate holders view the development and initiation of operational recovery plans to be within the purview of the certificate holder’s operating management - the initiating authority must rest with the certificate holder. However, upon such a decision being initiated by certificate holder operating management, the RAA member airlines agree that taking action on that decision appropriately requires the concurrence of the flightcrew member-in-command.

- The RAA member airlines support that portion of the (c)(1) regulatory language requiring agreement between the certificate holder and the flightcrew member in command before an extension decision is enacted.
- A second RAA member airline concern regarding the (c)(1) regulatory language is that it does not clearly specify whether the FDP that is permitted an extension in accordance with this section is the maximum FDP per Table B or the published FDP as assigned to a flightcrew member.
 - The answer to this question appears to be found in the following statement from the NPRM Preamble materials:

“The FAA has decided to propose the more conservative FDP’s depicted in Table A(1), with a 2-hour extension for unforeseeable circumstances beyond the carrier’s control permitted once in a 168-hour period”
 - From this NPRM statement, it is clear that the (c)(1) regulatory language is meant to provide permissive extension authority relative to the Proposed Amendment Table B maximum FDP limits.
 - The RAA member airlines support both this concept and the proposed 2-hour limit to such an extension, and propose alternate regulatory language in our recommendations below to provide regulatory clarity to that authority.
- Similar to the (c)(1) regulatory language, the proposed (c)(2) regulatory language also does not state clearly whether it is the maximum FDP per Table B or the published FDP as assigned to the flightcrew member that is subject to a limit of one FDP extension exceeding 30 minutes in any 168 consecutive hour period.

- Based on the NPRM Preamble language quoted above with regard to the (c)(1) regulatory language, it appears clear that the (c)(2) regulatory language setting a limit of one FDP extension exceeding 30 minutes in any 168 consecutive hour period is also meant to apply to FDP extensions beyond the maximum FDP per Table B.
- The RAA member airlines support this limit of one FDP extension exceeding 30 minutes beyond the Table B maximum FDP limits in any 168 consecutive hour period and propose alternate regulatory language in our recommendations below to provide regulatory clarity to that authority.
- A further RAA member airline concern with the proposed (c)(2) regulatory language is that establishment of a rolling 168 consecutive hour period as the limiting time period in this section needs to be reconsidered in light of the onerous daily tracking, record-keeping and compliance burden that it will place both on individual flightcrew members and on the certificate holder.
 - While current regulations deal with limits set in calendar days that can be easily understood and readily calculated by flightcrew members in the cockpit, assuring compliance under the proposed language will require flightcrew members to make multi-day consecutive hour calculations on the fly to keep track of individual compliance. Their ability to do this accurately and quickly will be problematic at best (and likely lead to interesting conversations in the cockpit – “You want to change my schedule how? Let me think. My consecutive hour starting point was last Tuesday, I think at 4 pm. So I add up how many hours for Tuesday? And then there’s 24 hours each for Wednesday, Thursday ... Now how many hours do I add for today, ‘cause it’s now 3 pm?”).
 - While airline scheduling computer systems can be programmed to accommodate this logic, every flightcrew member has an individual responsibility to track his/her own compliance, and a rolling hour tracking requirement will sorely test their ability to do that with operational disruption and unnecessary mental distraction and fatigue.
 - The RAA member airlines thus offer as an alternate, a much less problematic tracking and control proposal based on the concept discussed in the NPRM preamble material and found in §117.25 (b) that a flightcrew member’s fatigue clock is reset whenever he/she receives “at least 30 consecutive hours free from duty in any 168 consecutive hour period”. Using this requirement to set readily recognizable “markers” in time, we recommend below a change from the “once in any 168 consecutive hour period” limit language to “at most once between any two 30 consecutive hour rest periods.” This wording is easier to understand and would equally well ensure that flightcrew members are given the time necessary

to recover from any excess fatigue-producing extension to their flight duty period as does the proposed (c)(2) regulatory language but in terms that place far less tracking and compliance burdens on flightcrew members and certificate holders alike.

Recommendation: The RAA member airlines recommend the following:

- (1) Based on the new scientific evaluation of fatigue as related to FDP length, time of day and flight segments operated undertaken by WSU at the request of the RAA, that the Table B limits in the Proposed Amendment be revised upward in the 0400 through 1059 time frame to reflect the Table A(2) limits submitted by the ARC; and
- (2) Based on that same evaluation, that the Table B limits for 5 flight segment FDPs in the 1700 through 2159 timeframe be revised downward to reflect the Table A(2) limits submitted by the ARC; and
- (3) Revise the regulatory language in this section to the following:

§ 117.15 Flight duty period: Un-augmented operations.

(a) Except as provided for in § 117.17, no certificate holder may assign and no flightcrew member may accept an assignment for an unaugmented flight operation if the scheduled flight duty period will exceed the limits in Table B of this part.

(b) If the flightcrew member is not acclimated:

(1) The maximum flight duty period in Table B of this part is reduced by 30 minutes.

(2) The applicable flight duty period is based on the local time at the flightcrew member's home base.

(c) In the event unforeseen circumstances arise:

(1) With the concurrence of the flightcrew member-in-command, the certificate holder may extend an individual flightcrew member's flight duty period up to 2 hours beyond the maximum flight duty period specified in Table B.

(2) Extension of an individual flightcrew member's flight duty period exceeding 30 minutes beyond the maximum flight duty period specified in Table B may occur only once in any 168 consecutive hour period.

§ 117.17 Flight duty period: Split duty.

“For a split duty period, a certificate holder may extend and a flightcrew member may accept a flight duty period up to 50 percent of time that the flightcrew member spent in a suitable accommodation up to a maximum flight duty period of 12 hours provided the flightcrew member is given a minimum opportunity to rest in a suitable accommodation of 4 hours, measured from the time the flightcrew member reaches the

rest facility.”

Comment: RAA member airlines rely on Split Duty crew pairings for the practical and economic operation of certain late evening/early night flights out of a hub and corresponding early morning return flights to that hub (so-called continuous duty overnight or CDO pairings). These airlines have worked diligently with their labor groups to develop CDO scheduling agreements that both accommodate the airlines’ economic needs to operate these CDO trips and provide assurance that crews operating CDO trips are provided with sufficient fatigue-mitigating rest opportunities so that CDO flight operations do not compromise aviation safety. As such, the RAA member airlines agree with much of the preamble discussion on this topic and especially with the Proposed Amendment provision requiring adequate mid-trip rest “*in a suitable accommodation*”.

The RAA member airlines are very concerned, however, with the 12-hour flight duty period (FDP) limit that the Proposed Amendment places on Split Duty crew pairings. Current scheduling practice allows operation of CDOs with up to 15 hours of FDP, so the 12-hour restriction is a significant 20 percent FDP reduction from current practice. Given the nature of regional airline hub feed routes and the distances/flight times that they usually involve, current FDP hours over what the Proposed Amendment would permit most often serve as a fatigue-mitigating addition to the rest opportunity at the center of these pairings, rather than as a “fatiguing” increase to flight times either side of that rest opportunity.

Looking at an example based on the Proposed Amendment, the Table B FDP limit for a 2-leg CDO pairing starting at 2245 is 10.5 hours. Providing this CDO pairing with the proposed minimum 4-hour rest opportunity increases the FDP limit to 12 hours, the maximum FDP allowed by the Proposed Amendment (an allowable addition to the Table B FDP limit of 50 percent of the rest opportunity – 2 hours in this case – to a maximum FDP of 12 hours – reducing that allowable addition to 1.5 hours). Increasing the rest opportunity included in this CDO beyond the minimum required 4 hours would therefore provide no FDP extension benefit. But a 2245 start to an FDP equates to a near-midnight flight departure, a commercially unattractive departure time for passengers connecting to that flight from a late evening hub arrival bank. Were it not for the proposed 12-hour FDP limit, the spoke city in this case could be provided its desired earlier evening departure time from the hub, have an unchanged morning departure time back into the hub, and the pairing rest opportunity would increase to 5:30 hours from the 4-hour minimum cited in the above example.

The RAA member airlines agree with the philosophy of increasing FDP limits from those in Table B based on the length of the Split Duty rest opportunity provided in a Split Duty pairing. However, we do not believe that the duty period extension should be arbitrarily limited as it is in the Proposed Amendment. In an extreme example, a two-leg CDO pairing starting at 2030 and providing an 8-hour rest opportunity (nearly enough to qualify as full overnight rest) should be allowed a 15-hour FDP (11 hours from Table B plus 50% of the rest opportunity or 4 hours). Even if this CDO pairing was repeated for

several consecutive days, the assigned flightcrew members would receive 17 hours of rest (8 hours rest opportunity in the FDP plus 9 hours rest between FDPs) in each 24-hour period and nearly their complete window of circadian low would be spent at rest. Based on the above, the RAA member airlines believe the proposed 12-hour Split Duty FDP limit to be unnecessary.

Recommendation: Revise the regulatory language in this section to the following:

§ 117.17 Flight duty period: Split duty.

For a split duty period, a certificate holder may extend a flight duty period from the limits prescribed in Table B by up to 50 percent of the time that the flightcrew member spends in a suitable accommodation, and a flightcrew member may accept such a flight duty period, provided the flightcrew member is given a minimum opportunity of 4 hours to rest in a suitable accommodation, measured from the time the flightcrew member reaches the rest facility.

§ 117.19 Flight duty period: Augmented flightcrew.

Comment: None

Recommendation: None

§ 117.21 Reserve status.

- “ (a) *Unless specifically designated otherwise by the certificate holder, all reserve is considered long-call reserve.*
- (b) *For airport/standby reserve, all time spent in a reserve status is part of the flightcrew member’s flight duty period.*
- (c) *For short call reserve,*
- (1) *All time within the reserve availability period is duty.*
- (2) *The reserve availability period may not exceed 14 hours.*
- (3) *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.*
- (4) *The maximum reserve duty period for un-augmented operations is the lesser of –*
- (i) *16 hours, as measured from the beginning of the reserve availability period;*
- (ii) *The assigned flight duty period, as measured from the start of the flight duty period; or*
- (iii) *The flight duty period in Table B of this part plus 4 hours, as measured from*

the beginning of the reserve availability period.

(iv) If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the certificate holder may increase the maximum reserve duty period in paragraph (c)(4)(iii) of this section by one-half of the length of the time during the reserve availability period in which the certificate holder did not contact the flightcrew member, not to exceed 3 hours.

(5) The maximum reserve duty period for augmented operations is the lesser of –

(i) The assigned flight duty period, as measured from the start of the flight duty period; or

(ii) The flight duty period in Table C of this part plus 4 hours, as measured from the beginning of the reserve availability period.

(iii) If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the certificate holder may increase the maximum reserve duty period in paragraph (c)(5)(ii) of this section by one-half of the length of the time during the reserve availability period in which the certificate holder did not contact the flightcrew member, not to exceed 3 hours.

(d) For long call reserve,

(1) The period of time that the flightcrew member is in a reserve status does not count as duty.

(2) If a certificate holder contacts a flightcrew member to assign him or her to a flight duty period or a short call reserve, the flightcrew member must receive the required rest period specified in § 117.25 prior to reporting for the flight duty period or commencing the short call reserve duty.

(3) If a certificate holder contacts a flightcrew member to assign him or her to a flight duty period that will begin before and operate into the flightcrew member's window of circadian low, the flightcrew member must receive a 12 hour notice of report time from the air carrier.

(e) An air carrier may shift a reserve flightcrew member's reserve availability period under the following conditions:

(1) A shift to a later reserve availability period may not exceed 12 hours.

(2) A shift to an earlier reserve availability period may not exceed 5 hours, unless the shift is into the flightcrew member's window of circadian low, in which case the shift may not exceed 3 hours.

(3) A shift to an earlier reserve period may not occur on any consecutive calendar days.

(4) The total shifts in a reserve availability period in paragraphs (e)(1) through (e)(3) of this section may not exceed a total of 12 hours in any 168 consecutive hours.”

Comment: Since first receiving this NPRM, literally dozens of RAA member airline crew scheduling professionals have been working alone and in groups seeking to understand and evaluate the implications of the Proposed Amendment language relating to reserve status and the hour limits placed on reserve assignments by that language. Each of the participants approached this effort with an open mind, although that often required them to block out up to 20 years of professional experience in flight operations

and crew scheduling. It took this collective effort of comparing notes and working through the thickness of the words and the varying numeric limitations to come even close to unlocking the keys to understanding this proposed regulation. One conclusion that the group as a whole quickly reached through this effort is that the proposed reserve language is too complicated and complex to be real-world workable and, as it has been proposed, it will lead to years of interpretation uncertainty in actual operations, not what one would have hoped for a new regulation.

This complexity of the proposed language and, in many cases, the mental gymnastics necessary for the RAA member airline professionals to make order out of that language, together make necessary the extensive comments below and the form in which those comments are presented.

RAA Member Airlines Strongly Disagree With The Proposed Amendment Interpretation/ Determination That Short Call Reserve Be Considered Duty – From the outset of their reviews, the RAA member airline crew scheduling professionals sought to answer the question of what new information or science led to a regulatory interpretation/ determination that a short call reserve availability period (RAP) represents actual duty. The ARC certainly didn't find anything in their deliberations that supports such an interpretation/determination. Quoting from the NPRM Preamble materials:

“The ARC did not consider time within the RAP to be duty”

and

“... there appears to be a general agreement in the aviation community that reserve is neither rest nor duty”

Given the extensive scientific and operational ground covered by the ARC in its efforts leading to the FDP limits that it proposed, one would think that a concept as critical to the meaning and import of those FDP limits as to whether or not short call reserve should be counted as duty against them would have been a subject of much discussion. The fact that it wasn't strongly indicated that the ARC's determination *“not [to] consider time within the RAP to be duty”* resulted not from inattention to the subject but rather from a broadly shared belief that the answer to the question was so obviously *“not [to] consider time within the RAP to be duty”* as not to require writing down.

The only thin reed of support that the NPRM preamble material provides for a regulatory interpretation/determination to declare short call reserve as duty is:

“One of the most fatiguing elements of reserve duty is the lack of predictability. Unlike a flightcrew member who has a set schedule (a line-holder), a flightcrew member on reserve may spend several hours on-call and then, once called, be expected to report to the airport ready to commence his or her duty day. The lack of predictability means the reserve crewmember cannot schedule naps or

otherwise control his or her sleep opportunities to assure the reserve crewmember is adequately rested when he or she reports to work.”

Other than the above in the NPRM Preamble material, no RAA member airline recalls having heard any discussion supporting the notion of a fatiguing so-called “*lack of predictability*” associated with assignment to short call reserve. There is no “*lack of predictability*” when one is assigned to short call reserve – the flightcrew member knows when the RAP is scheduled to start, knows how long the RAP is, knows what his/her exposure to flight time is versus when he/she might be called out and knows that the times when he/she might be called to duty are as properly surrounded with rest opportunities as are any other airline crew assignment. There may be uncertainty as to exactly what time the call-out will come, but there is no unpredictability as to the RAP and the potential reserve obligations. A flightcrew member need only prepare himself/herself for those knowable factors and his/her day-of-operation fatigue mitigation opportunities can only improve from that point onward based on actuation of the real possibility of not getting called out at all.

The RAA member airlines are not aware of any studies or scientific basis supporting the NPRM statement quoted above, nor do we agree that the so-called “*lack of predictability*” in a reserve flightcrew member’s call-out for an FDP is a fatigue-inducing factor. Under longstanding current regulations, all flightcrew members, including flightcrew members on reserve, are provided a defined amount of time (a rest period) in which to make themselves rested in preparation for their next assignment. Like any other flightcrew member duty assignment, each reserve availability period (RAP) assignment is preceded by the required rest period to ensure that the flightcrew member begins his/her RAP ready to take a flight assignment without the need for further rest. While there is no restriction on or monitoring of a flightcrew member’s activity during a RAP other than the need that he/she be available by phone, it’s totally unclear why there is any “*lack of predictability* [in this situation that] *means the reserve crewmember cannot schedule naps or otherwise control his or her sleep opportunities.*” During a RAP, there will obviously be uncertainty with regard to the time within that period when the reserve flightcrew member will be called to duty and uncertainty as to the flight that reserve will be assigned to cover, but there is absolute certainty/ predictability as to the period of time that the reserve flightcrew member might be required to perform flight duties. Bottom line, sitting on a RAP is no different with respect to one’s ability to “*schedule naps or otherwise control his or her sleep opportunities*” than it would be for any other flightcrew member assigned to a line of flights – both assignments have been structured with at least regulatory rest opportunities surrounding the period of the assignment and no need for rest within the period of assignment.

Searching for key words (reserve, reserve fatigue, caused by reserve assignments, stand by...etc) on the NTSB website coverage of dozens of NTSB accident and incident investigations as far back as 1970 produced not a single reference that even hints that a flightcrew member is fatiguing while on reserve status or that a flightcrew member on reserve status has been linked to any accident or incident. In addition, in the course of developing the Fatigue Risk Management Plans (FRMPs) that all RAA member airlines submitted to the FAA by Congressional mandate in October, the documents listed below

were researched without finding a single reference to or accident /incident resulting from flightcrew member fatigue attributed to being on a scheduled reserve status. Nowhere in all of the extensive research undertaken by RAA member airlines in trying to understand this section of the Proposed Amendment was any support found for either the NPRM preamble statement quoted above or for a regulatory decision to consider a flightcrew member on a RAP assignment to be on “actual duty”. Neither was any support found for rejection of the ARC’s submission in this regard, as stated in the NPRM preamble material - “*the ARC did not consider time within the RAP to be duty.*”

Documents/publications searched for fatiguing factors associated with Reserve Status:

AC120-100 Basics of Aviation Fatigue (none found)

AC120-103 Fatigue Risk Management Systems (only mention of reserve is that flightcrew members on reserve are needed to cover for flightcrew members who call in fatigued)

SaFO 09014 Concepts for Fatigue Countermeasures (none found)

a Fatigue Related Material (none found)

ALPA White Paper - Fatigue Risk Management Systems (none found)

Fatigue Countermeasures in Aviation: Aviation, Space, and Environmental Medicine. Vol 80, No 1, Jan 2009 (none found)

Principles & Guidelines for Duty & Rest Scheduling in Commercial Aviation: NASA Technical Memorandum 110404 (none found)

Fatigue & Performance: Naval Safety Center, Feb 2009 (none found)

Practical & Diligent Application Of The Proposed Reserve Rules Will Not Be Easy For Either Certificate Holder Or Flightcrew Member – There are numerous everyday realities of airline operations, crew planning and scheduling, and operations management that seem to have been ignored in the rules proposed for something as intimately woven into the fabric of an airline operation as reserve rules:

- Keeping consistent
In the SOC and Daily Crew Scheduling environment, one major factor in keeping the airline running safely and on time is consistent handling of flightcrew member issues, concerns and questions. Considering the time and effort that has been required for the scheduling professionals to gain a basic level of understanding of the changes presented by the proposed rule, it will take a huge effort to train literally thousands of flightcrew members and hundreds of crew schedulers on how to calculate these rules. We are

concerned that long and stressful phone conversations will take place daily between flightcrew members and company operations staff and management when the flightcrew member should be considered “at rest”.

- **Reliability**
The complexity of the proposed rules and types of logic needed to understand the distinctions and rule differences between long call, short call, and ready reserve will make it a constant challenge to provide the required reliable information to the flightcrew members, schedulers and for reporting.
- **Quick response**
The pressure of running a safe, on-time and a reliable airline will increase as each situation requiring the call out of a reserve flightcrew member will have to be evaluated, reviewed and discussed with and/or possibly disputed by the flightcrew member in what should and could be a simple call out to replace another flightcrew member - all of this will increase stress and fatigue, exactly what the new rules are supposed to reduce.

One-Size Fits All Is Not A Meaningful Concept Or Undertaking When Discussing Reserve Status – As stated in the NPRM preamble, the ARC recognized three types of reserve as typical in the industry: long call, short call and airport ready reserve. The Proposed Amendment is the first time that these terms, which are generally applicable to Labor contracts, are appearing in regulatory language. In today’s airline world, the delineation between the types of reserves and details of when notification can, can’t or should be made is very airline-specific and often labor contract specific. Differences in the type of flying, flight segment length and aircraft routings between airlines and labor contracts simply cannot be addressed in the wholesale manner presented in the Proposed Amendment. One RAA member airline’s philosophy for the establishment of flightcrew member domiciles differs from that of the other member airlines. Another member airline has a completely different ratio of flightcrew members that live in a mix of hub bases and spoke bases not contemplated by these regulations. With the Whitlow letter establishment of rest periods before and after RAPs, the requirement that appropriate rest be ensured for flightcrew members on reserve has been widely addressed. The manner in which it has been addressed naturally differs among airlines based on individual airline route structures, corporate cultures, scheduling needs and labor/management relationships and agreements. Forced replacement of all of those customized approaches with the single, presumed one-size-will-fit-all, proposed regulations, regulations that appear not to be based on an understanding of how reserve works or has to work in numerous different individual airline situations, will be a huge step backward. Much of what has been proposed regarding reserve status seems to be more of an unwarranted intrusion into labor/management relations than a set of proposals aimed solely at mitigating fatigue.

There Is No Justification For Declaring Short Call Reserve To Be Duty – RAA member airlines must go on the record against the language in the Proposed Amendment that declares a flightcrew member on short call reserve to be on duty. The proposed regulatory language wrongly ignores that a flightcrew member spends his/her short call

RAP is in an environment of his/her own choosing, an environment in which he/she can feel comfortable and relaxed. An environment where he/she can sleep in his/her own bed or one of his/her own choosing, sit in his/her own chair or at his/her own home desk, etc., on top of which being afforded at least the same rest opportunities as are provided to a line flightcrew member. In regard its rest-like qualities, being on short call reserve provides rest opportunities similar to those of the semi-rest that the regulation gives credit for in the Split Duty rules contained in § 117.17.

While one cannot entirely disagree or dispute the possibility that the lack of predictability of when and to where a specific flight assignment might come may cause uncertainty, there is no evidence that this uncertainty causes fatigue. In fact, within the call-up constraints of the particular carrier, a reserve flightcrew member is free to manage his/her time in any way he/she chooses to mitigate such uncertainty. Any number of activities - sleeping, playing golf, fishing, watching TV or washing a car - would maintain and/or counteract any stress perceived as a result of needing to remain contactable during a RAP. It is not appropriate to equate this degree of freedom with the duties assigned to a flightcrew member in actual flight operations and declare a RAP to be “duty”.

Placing Limits On The Movement Of RAPs Is Counter To Airline Need, Airline Schedule Reliability And Airline Safety - Adherence To Set Schedules, Shifting RAP And Why Airlines Have Reserves – Much emphasis in the NPRM preamble material and in the proposed new regulations focuses on protecting flightcrew members with “set” schedules (lineholders) from being extended beyond their planned and current flying assignments (FDPs) or otherwise being shifted or changed in regards to rest, duty, sit time between flights or other adjustments. The RAA member airlines agree that keeping lineholders on their “set” schedules can help immensely in running an on-time airline for the flying public. We also agree that running an on-time airline is an important contributor to controlling many of the factors that can lead to fatigue. But unfortunately, the proposed regulatory focus on reducing the degree of schedule “uncertainty” (a word that appears quite regularly in the NPRM preamble materials) for lineholding flightcrew members is carried over in an inappropriate manner into the proposed rules governing reserve assignments and periods, where it does not need to be and does not belong. The limitations proposed with regard to permissible shifting of short call reserve RAP periods negatively impacts reserve scheduling, utilization and overall flightcrew member fatigue mitigation, and needs to be reconsidered.

The RAA member airlines believe that everyone, airline manager, flightcrew member and regulator alike, would agree that the major reason an airline staffs reserve flightcrew members is to have them available for deployment to replace lineholders who, for whatever reason (sick, on vacation, delayed by the weather, in training, etc.), have missed or will miss their flight assignment and, without a replacement being available, will cause a scheduled flight to be cancelled. That being the case, it is totally illogical to arbitrarily limit the movement of reserve flightcrew members’ reserve availability periods (RAPs) to only little amounts of time as an airline nears the day-of-operation. The proposed regulatory language limits to the degree to which RAPs can be shifted from planned and awarded RAP assignments, made possibly months before the day-of-operation, is

seriously flawed. An analogy might be that a rule such as the one being proposed would have prevented Patton's army from responding to the Battle of the Bulge because such a move was too far outside the original planning parameters. Stretching that analogy, without the availability of Patton's "reserves", Bastogne would have fallen and the weight of the unavailable "reserve availability" would have fallen on the soldiers trapped there, just as reasonably expected schedule disruption and fatigue impacts will fall on flightcrew member lineholders and the traveling public if the proposed limits on reserve period shifts are implemented.

Certificate holders regularly are required to shift somewhat intangible RAP "availability" timeframes, often days ahead of time, to keep crew availability in sync with situations impacting or expected to impact operations. There is no question that fatigue science and limitations need to be fully factored into planning these shifts to a RAP or group of RAPs, but putting arbitrary limits on the amount by which those RAPs can be shifted is not the answer, especially since there has been no evidence showing that such limits are in any way grounded in proper research, data analysis, fatigue science or an understanding of the dynamics of reserve assignments in the real world airline operating environment. Further, the limits as proposed hinder a certificate holder's ability to both reduce fatigue and balance the exposure to fatigue among all flightcrew members in the operation, in almost all circumstances forcing more individual flightcrew member schedules to be disrupted through delay or cancellation than would otherwise be necessary.

Modeling The Potential Manpower Impact Of The Proposed Rules Treating Short Call Reserve As Duty – Despite there being no meaningful justification for the Proposed Amendment's establishment of time spent on short call reserve as duty, implementation of the Proposed Amendment as currently written, will generate unnecessary staffing and scheduling cost with no benefit and potential harm to fatigue mitigation among flightcrew members. Constraining short call reserve assignments in compliance with the proposed regulations will require individual reserve flightcrew member schedules to be reduced and require reserve flightcrew members to work additional days in the operation in order to maintain current levels of flight pay.

A particularly unhelpful suggestion as to how a certificate holder might attempt to avoid at least the hiring part of the above conundrum is provided by the following statement quoted from the FAA Response to Clarifying Questions:

- *“Since the restriction is on actual duty rather than possible duty, the FAA does not believe that over-scheduling of reserve (or other duty) is prohibited as long as the actual duty limits are not exceeded. This appears to be largely a labor-management issue, although the FAA is interested in hearing if this type of over-scheduling has a negative safety impact.”*

The suggestion that a certificate holder might choose to avoid the reserve staffing, scheduling and expense issues resulting from the Proposed Amendment by just over-scheduling reserves on a planned basis and hoping that things would work out on an

“actual duty limits” basis hardly seems like the way that responsible airline management should be expected to comply with a unnecessary and overly complicated new set of reserve rules. It also seems a little strange in light of the FAA’s apparently unsupported belief that “unpredictability” is a fatigue-inducing factor impacting flightcrew members assigned to short call reserve that the above seems to recommend that reserve schedules be developed that are outside of regulatory limits and that, therefore, must be changed in some unpredictable way at some uncertain future point in order for the certificate holder to maintain compliance. What the above largely indicates is the lack of understanding of airline operations, crew scheduling, airline reserve staffing needs and processes, and the implications of the Proposed Amendment language for the quality of reserve flightcrew member life and individual flightcrew member take-home pay that unfortunately underlies the Proposed Amendment language regarding reserves.

The following analysis of the impact of the proposed rule declaring short call reserve to be “actual duty” and thereby governed by the various consecutive duty tracking rules shows the significant manpower impact resulting from this proposed regulatory change. Starting on the reasonable basis that short call reserve schedules should be planned in accordance with the regulations, Exhibit 1 below depicts a typical short call reserve flightcrew member RAP schedule assignment built to current regulatory limits. In this example, “R” represents an assigned RAP period and a “*” indicates a day off. This typical schedule example assumes that each RAP assignment is for the 14-hour 0600 – 2000 time period.

In a 28-day bid period, this schedule provides:

- 9 days off
- 19 days of RAP
- A combination of 2-day and 3-day blocks free from duty between consecutive RAP periods
- This represents a typical RSV Schedule reflecting a 28-day bid period, a minimum of 2 days off between every block of RSV days, and no more than 5 consecutive RSV days between days off

Exhibit 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
FR	SA	SU	MO	TU	WE	TH	FR	SA	SU	MO	TU	WE	TH	FR	SA	SU	MO	TU	WE	TH	FR	SA	SU	MO	TU	WE	TH
*	R	R	R	R	R	*	*	*	R	R	R	R	R	*	*	*	R	R	R	R	R	*	*	R	R	R	R

Exhibit 2 below details various important statistical measures associated with the Exhibit 1 reserve schedule example. Below Exhibit 2 are line-by-line descriptions/explanations of the information presented in the chart. The exercise takes the RAP schedule depicted in Exhibit 1 and contrasts how that RAP schedule would fare under current rules with how it would fare under the new Proposed Amendment rules.

Exhibit 2

	Captains	Current Rules	117.21 Rules
1	Bid Month Days	30	28
2	Bid periods in Year	12	13
3	Maximum RAP Hours	14	14
4	Maximum Duty Week (168 hrs)	0	70
5	Maximum Duty in 28 days (672 hrs)	0	266 (max 215)
			Adjustments Made
6	Average RSV days per/period	19	15
7	Average RSV days per/year	228	195
8	Average RSV Less per/period	0	4
9	Average RSV Less per/year	0	52
10	Average RSV Captains per/period	25	25
11	Average Total RSV per/month	475	375
12	Average Total RSV per/year	5700	4875
13	Yearly Loss of Available Days		825
14	Equivalent RSV Heads		4.2

Referring to Exhibit 2 above:

- Lines #1 The number of days in a scheduling period.
- Line #2 The resulting annual number of bid periods
- Line #3 14 hr RAP period that today is not considered “duty” but, for this exercise will be considered “duty” in order to calculate rolling hours.
- Line #4 Overlays the hours of “duty” under the proposed new rules (14 hours each RAP) onto the typical RSV schedule, reaching a high of 70 hour in a rolling 168-hour period on day 6, 14, 22, and 28
- Line #5 The Exhibit 1 schedule, which is legal under the proposed rules up to this point, becomes illegal under those rules by failing to meet the 215 hrs max in a rolling 672 hour period (28 days), requiring that adjustments be made. Removing work days and/or a combination of that and lowering the 14 hr duty each day are the only two options that will make this otherwise reasonable RAP schedule legal under 117.21.
- Line #6 Average RAP days per reserve flightcrew member under the proposed rules decrease from 19 to 15 per bid month (21% reduction)
- Line #7 Average annual RAP days per reserve flightcrew member decrease from 228 to 195 (14% reduction)
- Line #8 Average available RAP days per bid month/reserve flightcrew member decrease by 4
- Line #9 Average annual available RAP days per reserve flightcrew member decrease by 52
- Line #10 Average number of Reserve Captains required each month in 2010 (typical airline requires 25 Captains with reserve assignments each bid month)

- Line #11 Average number of available Captain RAP days each bid period based on above Line #10 staffing decreases from 475 to 375 (21% reduction).
- Line #12 Average number of available Captain RAP days each year based on above Line #10 staffing decreases from 5700 to 4875 (14% reduction).
- Line #13 Yearly losses of available Captain RAP days based on above Line #10 staffing and implementation of the proposed rules - 825
- Line #14 **Number of net new Captains needed for assignment to reserve status to offset loss of reserve Captain coverage resulting from proposed new regulations – 4.2 per 25 Captains currently in reserve (a 17% reserve staffing increase)**

Exhibit 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
FR	SA	SU	MO	TU	<u>WE</u>	TH	FR	SA	SU	MO	TU	WE	<u>TH</u>	FR	SA	SU	MO	TU	WE	TH	<u>FR</u>	SA	SU	<u>MO</u>	TU	WE	TH
*	R	R	R	R	*	*	*	*	R	R	R	R	*	*	*	*	R	R	R	R	*	*	*	*	R	R	R

Exhibit 3 above adjusts the schedule depicted in Exhibit 1, by removing 4 reserve assignment days (underlined) to address the 215 hours in a rolling 672 hours limit

- 13 days off
- 15 days of RAP
- Basically a 4 RAP days and 4 Off days is all that can be constructed

Leading to several obvious questions:

- Why does the reasonable schedule of RAP periods depicted in Exhibit 1 (5 day blocks of reserve assignment separated by periods of 2 or 3 days off) that is not in violation on a rolling 168-hour basis throughout the entire bid period and that, if extended, would not be in violation on an annual basis, produce a violation (and not just a little one) on the basis of the rolling 672 hour limits established by the proposed new regulation?
- Where in the cost/benefit analysis of the proposed new regulation has the resulting requirement to increase reserve staffing across the entire airline industry by 17% been accounted for?
- What is the logic behind the rolling period limits proposed by the new regulation that causes a pattern of reserve assignment be acceptable on a weekly and annual basis but in violation on a monthly basis?

Now return to the above reserve model to consider the fatigue mitigation, staffing and operational impact of the following regulatory language controlling RAP shifts:

“The total amount of shift in RAPs for a flightcrew member may not exceed 12 hours (regardless of direction) in any 168 consecutive hour period.”

Recall that the Exhibit 3 reserve schedule above resulted from reducing the Exhibit 1 current rule reserve schedule by four RAP days from the current reserve schedule

presented in Exhibit 1. This reduction was made necessary by the Proposed Amendment declaration that RAP is duty and thereby governed by proposed cumulative FDP limits, in the case of Exhibit 3 by the limit to 215 RAP hours in a rolling 672 hours. Now assume that this schedule was planned with a RAP of 0600-2000 (14 hours) on each of the assigned days. In testing the implications of the “*total amount of shift*” restriction above, further assume that this flightcrew member’s planned RAP is shifted to (1200-2300) on Monday the 4th and Tuesday the 5th (12 hours of total shift) in expectation of bad weather at the hub, but the weather doesn’t materialize as forecast and the reserve flightcrew member is not even called out. Now comes Sunday the 10th, the snow is really going to come down tonight, and crew scheduling wants to shift this flightcrew member’s RAP back by 2 hours to have him available to help deal with the storm disruption impacting the 1800 connecting bank. Unfortunately, this reserve flightcrew member cannot be shifted to the need because his permissible “shift” hours for the period were spent on Monday and Tuesday. Even after 4 days off, the proposed RAP shift restriction prevents a minor 2-hour shift in this flightcrew member’s RAP because it would exceed 12 hours of shift in a rolling 168-hour period.

The “shift in RAP” language makes no sense in real world operations and serves no purpose as a fatigue mitigation strategy. As discussed above with regard to “short call RAP as duty”, the result of the new “shift in RAP” language will be a lack of reserve availability and flexibility when it is otherwise arguably available. This language will significantly reduce a certificate holder’s ability to reduce fatigue and balance the exposure to fatigue among all of its flightcrew members by forcing more individual flightcrew member schedules to be disrupted through delay or cancellation than would otherwise be necessary. Absent the proposed rule, any fatigue issues potentially arising from reserve duty period shifts can easily be resolved within the reserve assignment process as it now stands using the rest rules that surround and cushion reserve and lineholder assignments alike. Simply stated, the proposed language limiting reserve period shifts is a problematic “solution” in search of a problem that doesn’t exist.

The RAA member airlines strongly recommend that the proposed regulatory language dealing with reserve assignments and defining short call reserve as duty be withdrawn from the Proposed Amendment. As written, that language appears to be based on a seriously flawed understanding of the dynamics of fatigue and fatigue mitigation in the context of reserve duty assignments, and on flawed arithmetic in setting the proposed new limits. The Proposed Amendment has clear implementation issues in an airline operating environment. It lacks any fatigue mitigation benefit for flightcrew members holding reserve assignments and indeed, is likely to frustrate fatigue mitigation across the broader flightcrew member workforce. Significant added manpower requirements and disrupted schedule expenses would result from implementation of this proposed regulatory language as it now stands, while almost no fatigue mitigation benefits can be expected.

Recommendation: The RAA member airlines recommended language below offers an alternative to both the Proposed Amendment reserve language and current regulations that holds true to our core belief that time spent on short call reserve is not duty and also

brings recent findings in fatigue science regarding interruptions to rest in the WOCL into the reserve assignment process. Our recommendation is as follows:

- (1) That all of (c) be deleted and replaced by the language below; and
- (2) That all of (e) be deleted, as it serves no useful purpose in preventing or mitigating fatigue and represents an unwarranted regulatory intrusion into labor/management relations.

§ 117.21 Reserve status.

(a) Unless specifically designated otherwise by the certificate holder, all reserve is considered long-call reserve.

(b) For airport/standby reserve, all time spent in a reserve status is part of the flightcrew member's flight duty period.

(c) For short call reserve,

(1) When a flightcrew member is given a flight duty assignment within a short call reserve period, the flight duty period for that assignment, measured from the time of report for the assignment, is limited to the Table B flight duty period limit for the assignment report time minus one-half of the time spent on reserve during the reserve availability period up to the report time.

(2) When a reserve crewmember is called between 0100 and 0600 local base time and given a flight duty assignment within a short call reserve period, the flight duty period for that assignment, measured from the time of report for the assignment, is limited to the Table B flight duty period limit for the assignment report time minus the full time spent on reserve during the reserve availability period up to the report time.

(3) Reductions taken to the Table B flight duty time limits under (c)(1) and (c)(2) above are not duty and are not to be included in any determinations of performance against cumulative duty limits.

(d) For long call reserve,

(1) The period of time that the flightcrew member is in a reserve status does not count as duty.

(2) If a certificate holder contacts a flightcrew member to assign him or her to a flight duty period or a short call reserve, the flightcrew member must receive the required rest period specified in § 117.25 prior to reporting for the flight duty period or commencing the short call reserve duty.

(3) If a certificate holder contacts a flightcrew member to assign him or her to a flight duty period that will begin before and operate into the flightcrew member's window of circadian low, the flightcrew member must receive a 12 hour notice of report time from the air carrier.

(e) [Deleted in its entirety]

(1) [Deleted in its entirety]

(2) [Deleted in its entirety]

(3) [Deleted in its entirety]

(4) [Deleted in its entirety]

§ 117.23 Cumulative duty limitations.

“ (a) *The limitations of this section on flightcrew members apply to all commercial flying by the flightcrew member during the applicable periods.*

(b) *No certificate holder may schedule and no flightcrew member may accept an assignment if the flightcrew member’s total flight time will exceed the following:*

- (1) *100 hours in any 28 consecutive calendar day period and*
- (2) *1,000 hours in any 365 consecutive calendar day period.*

(c) *No certificate holder may schedule and no flightcrew member may accept an assignment if the flightcrew member’s total Flight Duty Period will exceed:*

- (1) *60 flight duty period hours in any 168 consecutive hours and*
- (2) *190 flight duty period hours in any 672 consecutive hours.*

(d) *Except as provided for in paragraph (d)(3) of this section, no certificate holder may schedule and no flightcrew member may accept an assignment if the flightcrew member’s total duty period will exceed:*

- (1) *65 duty hours in any 168 consecutive hours and*
- (2) *200 duty hours in any 672 consecutive hours.*
- (3) *If a flightcrew member is assigned to short-call reserve or a certificate holder transports a flightcrew member in deadhead transportation in, at a minimum, a seat in aircraft cabin that allows for a flat or near flat sleeping position, the total duty period may not exceed:*
 - (i) *75 duty hours in any 168 consecutive hours and*
 - (ii) *215 duty hours in any 672 consecutive hours.*
- (4) *Extension of the duty period under paragraph (d)(3) of this section is limited to the amount of time spent on short-call reserve or in deadhead transportation”.*

Comment: As stated in the NPRM Preamble material, cumulative duty limits, although difficult to set at specific values, are a generally accepted component in regulatory schemes in defense against fatigue and the development of cumulative rest or sleep deficits. It is, however, impossible to find justification for the scheduled air transportation need for three different sets of cumulative limits (flight time, flight duty period and duty) comprising a total of eight different rolling time period limits (on top of two different daily limits – flight time and flight duty period) as included in the Proposed Amendment.

The European approach to duty time regulation encompasses broader goals than does such regulation in the United States. American regulation most often seeks to solve a narrow problem, in this case flightcrew member fatigue, while the broader European approach seeks to solve that problem while also fostering other societal goals. Both CAP-371 and the EASA regulations envision a system of “fair and equitable” crew scheduling that is justified in a European context by its intent of spreading more fatiguing assignments among the entire flightcrew member community as opposed to concentrating them on the most “junior” bidders, an approach that is foreign to American life and to the American approach to scheduling flightcrew members.

The inclusion of annual limits in the CAP-371 and EASA regulations, by itself, is not sufficient justification for their inclusion in the Proposed Amendment. American societal goals rightly focus on protection of individual initiative and, indeed, our nation prides itself on being more productive than Europe across our economy. While the RAA member airlines generally accept that some reasonable set of cumulative “time at work” limits are an important component of a new regulation designed to mitigate against flightcrew member fatigue negatively impacting airline safety, eight such cumulative limits is clearly regulatory overkill and the group of proposed limits needs to be considerably thinned out.

A good place to start with that thinning is with the annual limit on flight time included in the Proposed Amendment. No hard evidence is put forth in the NPRM Preamble material to justify the proposed 1,000 flight hour rolling 365-day limit on flight time, or indeed any limit at all on flight time, other than the passing comment that CAP-371 and EASA regulations contain such a limit. The NPRM Preamble material and the Proposed Amendment make no case at all that annual flight time limits have any effect in fatigue mitigation, which is not surprising as it would really stretch one’s imagination to believe that a cumulative sleep deficit or fatigue problem could be meaningfully resolved through imposition of a rolling 365-day limit. Indeed, the only argument put forth for inclusion of the 1,000 flight hour rolling 365-day limit in the proposed regulation is that without such a limit, a flightcrew member could theoretically fly 2,000 hours in a year based on the proposed daily flight hour limits also included in the Proposed Amendment. But that “concern” is also quickly eliminated by the Proposed Amendment’s rolling 28-day flight time limit, the effect of which is to limit permitted annual flight time to at most 1,304 hours. But even that reduced limit is not necessarily the most limiting of the multiple limits included in the Proposed Amendment, as the new rule’s reduction in permitted maximum daily flight duty period hours by time of day and by the number of segments operated in a flight duty period will likely further lower the that ostensible cap in practical day-to-day operations.

- For these reasons (and many more – see below), the RAA member airlines strongly urge that the annual limit on flight time contained in §117.23 (b) (2) be eliminated from the regulation. There is simply nothing to support the notion that what a flightcrew member did 365 days in the past has any influence on his/her alertness or fatigue in the present. What is proposed is an arbitrary limit that does not further the goals of the regulation.

As is readily apparent from the above, it is pretty easy to see the silliness in the proposed overlapping flight time limits. One limit is “required” as the solution to a “problem” that vanishes in the face of another proposed limit and even the impact of that limit might be superseded by yet another of the proposed limits. But there is equal silliness in the overlapping among the three separate kinds of rolling period hourly limits included in the Proposed Amendment. Cumulative flight time limits and cumulative flight duty time limits basically intertwine to cover the same fatigue mitigation risks. Cumulative duty time limits add a minor new dimension to the mix - the inclusion of time that a flightcrew member might spend performing tasks assigned by the certificate holder that do not

involve the flying of an aircraft – but these are seldom a significant factor is the scheduling of crews. Mostly what the three sets of cumulative “time at work” limits do is overlap each other, make compliance difficult to confirm (each of the three sets of the “weekly” and “monthly” limits are established on a consecutive hour basis – try calculating that sometime), make the calculations needed to confirm that compliance hard to navigate, and overall likely lead to individual flightcrew member’s feeling good that they have met a required limit only to later discover that another cumulative time measure was more limiting than the one that he/she worked hard to calculate and believed he/she had met.

Furthermore, the inclusion of three separate cumulative limits seems unnecessary for the mitigation of fatigue and for flight safety, as well as being overly complicated. Throughout the preamble, it is repeatedly stressed that flight duty is the predominant source of flightcrew member fatigue, followed by commuting. Flight hours themselves are not considered a significant source of fatigue and their influence is readily captured in the regulation of flight duty periods. For this reason, and as discussed above, there is no compelling reason to include the limitation of flight hours in the cumulative limitations. Indeed, the title of this section of the regulation pointedly excludes flight hours. Limits on flight hours accomplish nothing with regard to fatigue mitigation that is not already addressed in the duty limitations.

The inclusion of total duty limits on top of flight duty limits seems to also be unnecessarily confusing and redundant. While it might be suggested that the fatigue impact of flightcrew member time spent performing tasks assigned by the certificate holder not involving the flying of an aircraft is something that should be considered, the RAA member airline discussions below regarding § 117.29 provide an alternate way to control the potential for fatigue relating to such activities from impacting flight safety.

- We have therefore recommended language below simplifying the proposed regulation by establishing cumulative flight duty period limits only, since it is this factor that is most often cited as fatigue generating and best ensures fatigue mitigation and aviation safety.

As in other parts of the Proposed Amendment, this section shows an unfortunate lack of specificity as to how these limits are to be measured and enforced in practice. This situation is made all the more concerning by the following quotes from the FAA’s Response to Clarifying Questions document:

“The certificate holder is required to track all time that the individual is on duty, and to the extent the individual is required to be in touch with the certificate holder by checking email or answering phone calls, that time is included in the cumulative duty restrictions”

and

“The FAA has not determined whether union time would count as duty.”

and

“Should it become apparent after pushback, but prior to takeoff, that a flightcrew member will exceed his or her allowable flight time limits, the airplane would need to return to the gate.”

and

“The proposed regulatory text does not address whether some allowance should be made for a flightcrew member at the end of his or her cumulative duty limit, but the certificate holder cannot allow the individual to be free from duty because of circumstances beyond its control.”

Statements such as these are red flag warnings of interpretational issues that will dog certificate holders and flightcrew members alike as they seek compliance to the Proposed Amendment regulations. One critical area of concern in this regard relates to the last two quoted passages above. While every certificate holder will plan its flightcrew member assignments to the proposed daily flight duty periods so as to ensure compliance with cumulative duty limits established by regulation, there is no guarantee that weather, an aircraft mechanical, or one of any number of other “*unforeseen circumstances*” might develop during the performance of an individual duty period that would not permit that flight duty period to be completed within the cumulative limits.

- Current official regulatory interpretation, often phrased as “legal to start, legal to finish”, appropriately covers such situations that might be expected to arise as a result of “*unforeseen circumstances*”. Regulatory language formally stating that a flightcrew member is considered to be in compliance with the cumulative duty limits of this section if he/she was legally scheduled in compliance with those limits at the beginning of his/her assigned FDP needs to be included in the regulatory language of this section.²
- The RAA member airlines recommend such language below.

Recommendation: Based upon the above, the RAA member airlines recommend the following:

- That §117.23 (b), (b)(1) and (b)(2) each be deleted in their entirety from the proposed regulations; and
- That §117.23 (d), (d)(1), (d)(2), (d)(3), (d)(3)(i), (d)(3)(ii), and (d)(4) each be deleted in their entirety from the proposed regulations; and

² While, by our comments, the RAA member airlines recommend elimination of the Proposed Amendment language placing daily and cumulative limits on flight time and on duty, should the FAA reject these recommendations and issue a final rule including daily and cumulative limits on flight time and duty, then the relief requested in this paragraph should also be applied to those additional limits.

- That a new §117.23 (f) be added to this section to provide compliance guidance with regard to unforeseen circumstances impacting compliance with these cumulative duty limits.

§ 117.23 Cumulative duty limitations.

(a) The limitations of this section on flightcrew members apply to all commercial flying by the flightcrew member during the applicable periods.

(b) [Deleted in its entirety]

(1) [Deleted in its entirety]

(2) [Deleted in its entirety]

(c) No certificate holder may schedule and no flightcrew member may accept an assignment if the flightcrew member’s total Flight Duty Period will exceed:

(1) 60 flight duty period hours in any 168 consecutive hours and

(2) 190 flight duty period hours in any 672 consecutive hours.

(d) [Deleted in its entirety]

(1) [Deleted in its entirety]

(2) [Deleted in its entirety]

(3) [Deleted in its entirety]

(i) [Deleted in its entirety]

(ii) [Deleted in its entirety].

(4) [Deleted in its entirety]

(e) In the event that unforeseen circumstances delay completion of a flight duty period, a flightcrew member is considered to be in compliance with the limitations of this section if that flightcrew member was legally scheduled at the beginning of his assignment to that duty period.

§ 117.25 Rest period.

“ (a) No certificate holder may assign and no flightcrew member may accept assignment to any reserve or duty with the certificate holder during any required rest period.

(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, except that:

(1) If a flightcrew member crosses more than four time zones during a series of flight duty periods that exceed 168 consecutive hours, the flightcrew member must be given a minimum of three physiological nights rest upon return to home base.

(2) A flightcrew member operating in a new theater must receive 36 hours of consecutive rest in any 168 consecutive hour period.

(c) 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 consecutive hours before beginning the reserve or flight duty period measured from the time the flightcrew member reaches the hotel or other suitable

accommodation.

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

Comment: While flight duty is the prime generator of fatigue, rest is very clearly the prime component of fatigue mitigation. The RAA member airlines feel that the over-all approach with regards to rest in this section is reasonably supported but that there are problems and ambiguities in the wording of a number of the provisions. One such problem with respect to the meaning the statement that “*No certificate holder may reduce a rest period more than once in any 168 consecutive hour period.*” was resolved in the FAA Response to Clarifying Questions, which makes clear that this language is intended to mean that “*The limitation on rest reductions applies to each flightcrew member and not to the certificate holder’s entire schedule during the rolling period*”, the language in the Proposed Amendment will have to be clarified in that regard.

Another is that the same questions discussed above regarding to §117.15 (c) (2) are equally applicable to the language of this section. Those questions are: (1) does the limit apply to any scheduled rest period? or (2) does it specifically refer to the minimum rest referred to in §117.25 (d)? If the restriction applies to any rest period, it would seem to be overly restrictive, as a reduction of a 22:00 rest to 20:00 would hardly seem to be fatigue inducing when considering the limits imposed by the regulation on duty limits. Additionally, since transportation to a rest facility is largely out of the control of the carrier, requiring a carrier to relieve an entire crew from duty as a result of traffic congestion on the way to the hotel seems overly burdensome, and especially so in the cases of small reductions to longer layovers that have little or no impact on the ultimate state of flightcrew member alertness if adequate rest is still provided prior to the next assignment.

The intent of §117.25 (d) is clearly stated – to give flightcrew members “*a rest period of at least 9 consecutive hours before beginning the reserve or flight duty period ...*”. The application of this rule is less than clear when it pertains to rest periods other than those scheduled and taken in a hotel at a layover city. There is no effective way that a certificate holder can take responsibility for ensuring that a flightcrew member on a long layover in the city where he may actually reside is getting ALL of the rest that he is scheduled to be given, other than by requiring the flightcrew member to utilize the provided facility, but this seems unnecessary and denies the flightcrew member potentially better rest with family.

As to rest in domicile, the FAA has gone out of its way to avoid restricting flightcrew member commutes, yet these commutes make it unreasonable to require the company to ensure that a flightcrew member is actually taking proper advantage of a 9-hour opportunity for rest provided by the certificate holder in his/her schedule. In effect, such a requirement would necessitate that carriers set up individual rest parameters for each flightcrew member in each city where it schedules rest. Unfortunately, the confusion in

this regard was only made worse by the following statement in the FAA Response to Clarifying Questions document:

“Regardless of whether the flightcrew members live at their home domicile or in a different theater, the certificate holder is expected to calculate the typical length of time it would take the flightcrew member to return home, just as it would be required to calculate the typical length of time it would take to get a flightcrew member to a hotel. Since transportation can never be considered rest, certificate holders need to have some cognizance of where their flightcrew members live and whether they are likely to be resting in a hotel or at home. Obviously the certificate holder cannot control for every circumstance, such as a crewmember choosing to visit extended family members. In that instance, the flightcrew member would bear responsibility for assuring that he or she could get the requisite rest opportunity.”

We find it disturbing that a certificate holder might be asked or worse required to affect the behavior of a commuting flightcrew member through the oversight of individual commuting practices as inferred by the NPRM language and in the FAA Response to Clarifying Questions document. Through such undefined oversight, if the certificate holder determines that flightcrew members are routinely commuting during their WOCL's, then how is the certificate holder expected to handle it? Should the certificate holder restrict its own jumpseat and non-revenue passenger use within certain windows prior to a flightcrew member's report time? Even were this possible, no doubt algorithms would also be required to judge each individual's WOCL based on subjective criteria. Could zip codes be utilized, or would a flightcrew member need to be required to provide data to his or her employer of his or her “Home WOCL Window”. Also, if the certificate holder were to try to modify its CASS Agreement or to work with the industry to limit CASS privileges for pilots within certain “windows” and within certain “commuting parameters”, this would create a firestorm that no certificate holder is prepared or equipped to handle.

Additionally, the NPRM comment that *“If a carrier determines that the flight crew member was responsible for becoming fatigued, it has every right to take steps to address that behavior”* may sound appropriate, but within the context of labor-management relations this is a third rail issue. Airlines are routinely charged with harassment for questioning multiple sick calls or for discussing “lessons learned” related to fatigue calls. Absent individual agreements with each certificate holder's bargaining unit, such a statement of carrier rights is not credible.

As discussed above, it is the position of the RAA member airlines that personal commuting practice must be considered as a flightcrew member responsibility tied to each flightcrew member's responsibility to be fit for duty for every FDP to which they are assigned, a position that would seem to agree with the sentence that concludes the paragraph in the FAA Response to Clarifying Questions document from which the above language was quoted:

“Obviously the certificate holder cannot control for every circumstance, ... the flightcrew member would bear responsibility for assuring that he or she could get the requisite rest opportunity.” t

Another way to approach questions such as this would be to differentiate between total time spent in a layover location and the portion of that total time that represents required rest time. In effect, this would allow carriers to designate which 9 hours of a given layover period is actually rest, and shift the burden of taking the required 9 hour rest in domicile or at a layover where the flightcrew member resides onto the flightcrew member. The only thing in the regulation as proposed that prevents carriers from doing this is the phrase at the end of §117.25 (d) that states that rest is measured “from the time the flightcrew member reaches the hotel or other suitable accommodation.” One could interpret this phrasing as an encouragement to carriers to prevent flightcrew members from going to the hotel in order to shorten their “scheduled rest.” This would certainly be counterproductive to fatigue mitigation. This portion of §117.25 (d) might be better worded by stating that “all rest at a layover station will occur at a hotel or other suitable accommodation.” Such wording would allow carriers to schedule rest without punishing them for providing more than the required rest. It would also go a long way in clarifying what is intended in §117.25 (c).

As was discussed extensively above with respect to §117.15 (c) (2), choice of a 168 consecutive hour period as the physical delimiter controlling this regulatory restriction seems arbitrary and likely will present a significant difficulty to flightcrew members having to make an individual determination of personal compliance during the operating day. A better delimiter of this restriction would be the “at least 30 hour” rest period specified in §117.25 (b). If the permissible number of reductions is to be limited, then that limitation should apply between the 30 hour rest periods specified in §117.25 (b). We have accordingly recommended alternative language for §117.25 (c) below making this change. The recommended language also includes the “*unforeseen circumstances*” considerations detailed in §117.25 (e) of the Proposed Amendment, making that section of the proposed regulation unnecessary.

Recommendation: Revise the regulatory language in this section to the following:

§ 117.25 Rest period.

(a) No certificate holder may assign and no flightcrew member may accept assignment to any reserve or duty with the certificate holder during any required rest period.

(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, except that:

(1) If a flightcrew member crosses more than four time zones during a series

of flight duty periods that exceed 168 consecutive hours, the flightcrew member must be given a minimum of three physiological nights rest upon return to home base.

(2) A flightcrew member operating in a new theater must receive 36 consecutive hours of rest in any 168 consecutive hour period.

(c) No certificate holder may reduce a flightcrew member's minimum rest period as specified in §117.25 (d) more than once in the period following that flightcrew member's most recent rest period of at least 30 consecutive hours and, in the event of unforeseen circumstances, in no case can that reduction result in a rest period of less than 8 hours. A reduction below 9 hours can only be scheduled with the concurrence the flightcrew member-in-command

(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 consecutive hours before beginning the reserve or flight duty period measured from the time the flightcrew member reaches the hotel or other suitable accommodation.

(e) [Deleted in its entirety]

§ 117.27 Consecutive nighttime operations.

“ No certificate holder may schedule and no flightcrew 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.”

Comment: While a limitation on consecutive nighttime operations is appropriate from a fatigue mitigation standpoint, setting that limit at *“three consecutive nighttime operations”* is not. Setting this limit needs to be based on a proper balance of a number of conflicting messages from fatigue science and modeling. These conflicting messages were well-presented in the NPRM Preamble materials:

“Modeling indicates that consecutive nights of nighttime work will lead to a decrease in productivity over a relatively short period of time (approximately 3 days). The modeling notes a steady deterioration in performance because it is very difficult for most people to sleep effectively during the day”

“The members of the ARC who had flown nighttime operations generally agreed that the first night of multiple nighttime operations was the most difficult because they were unaccustomed to being awake all night.”

“The cargo carriers asserted that higher levels of sleep pressure brought on by the longer period of wakefulness on day one of the pairing act to offset the general inability to sleep effectively during the day, particularly when people have been trained to understand the need to take advantage of the sleep pressure to improve their ability to sleep during the day.”

“The FAA has asked Dr. Hursh, who developed the SAFTE/FAST model, to input these assertions into the model. Dr. Hursh determined that, given a sufficient sleep opportunity at night, a person can sustain his or her performance at acceptable levels for five consecutive nights.”

The above quotations from the NPRM Preamble material aptly point out the competing arguments that need to be balanced in setting a regulatory limit on consecutive nighttime operations to ensure that the safety of such operations is not compromised by fatigue – Three operations? Five operations? Reduce the number of “*first night*” operations? In the NPRM Preamble materials, the FAA itself addresses these conflicting factors:

“The FAA has concerns that simply limiting nighttime operations to three consecutive nights could result in a significant increase in the number of first night operations, since presumably carriers will not change the nature of their operations, but simply will schedule more multiple-night crew pairings to accommodate the existing operations. Thus, a flightcrew member who is currently assigned two 5-night pairings in a 2-week period could potentially be assigned three 3-night pairings in the same 2-week period, increasing the risk associated with the first night of operations by 50 percent during that timeframe. Certainly long-standing industry practice has been to fly more than three consecutive nights. The FAA is concerned that taking an approach that may appear safer in modeling could lead to adverse safety impacts in the real world.”

In seeking a proper balance among these competing concerns, the FAA came down with a limit of “*three consecutive nighttime operations*”. The RAA member airlines believe “four consecutive nighttime operations” to be the proper balance.

Recommendation: Revise the regulatory language in this section to the following:

§ 117.27 Consecutive nighttime operations.

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

§ 117.29 Deadhead transportation.

“ (a) All time spent in deadhead transportation is considered part of a duty period.

(b) Time spent in deadhead transportation is considered part of a flight duty period if it occurs before a flight segment without an intervening required rest period.

(c) Time spent entirely in deadhead transportation during a duty period may not exceed the flight duty period in Table B of this part for the applicable time of start

plus 2 hours unless the flightcrew member is given a rest period equal to the length of the deadhead transportation but not less than the required rest in § 117.25 upon completion of such transportation.

Comment: Including deadhead travel that is immediately prior to a flight or a series of flights in the FDP limitations of the Proposed Amendment (see (b) regulatory language above) is consistent with past regulations and certainly continues to be justified for the mitigation of fatigue and thereby the improvement of operational safety. Such deadhead travel cannot be considered rest and may directly impinge on the fatigue-state of a flightcrew member and on his/her readiness for his/her flight assignment.

However, deadhead travel is only one of any number of company activities in which a flightcrew member might be engaged at the company's direction immediately prior to operating "*a flight segment without an intervening required rest period.*" As quoted in the NPRM Preamble material, the ARC took note of such activities as "*any task that crewmembers are required by the certificate holder to perform including, but not limited to: flight duty, administrative work, ground training, ancillary training, positioning and airport standby.*" The RAA member airlines believe that the subsection (b) regulatory language of the Proposed Amendment should be revised to cover consideration of all such "*task[s] ... required by the certificate holder*" that a flightcrew member may be engaged in prior to "*a flight segment without an intervening required rest period.*" Further, this new language should make clear that time spent in the performance of such company-directed non-flight activities, while requiring consideration in the determination of individual FDPs, are not to be included in calculations of adherence against cumulative FDP limits.

That being said, the currently proposed regulatory language of subsections (a) and (c) provides an entirely unnecessary duplication of considerations addressed, and rules and limitations found, elsewhere in the Proposed Amendment (§ 117.5 Fitness for duty, § 117.15 Flight duty period : Unaugmented operations, § 117.21 Reserve status, and § 117.25 Rest period) and should be deleted in its entirety.

Bottom line is that this section of the Proposed Amendment should be rewritten and re-titled such that it treats deadhead travel and all other non-flight company directed flightcrew member activities occurring prior to "*a flight segment without an intervening required rest period*" in the same manner.

Recommendation: That the Proposed Amendment title and regulatory language for this section be deleted in its entirety and replaced with the following:

§ 117.29 Time spent in non-flight certificate holder-directed activity

Any time that a flightcrew member spends in any certificate holder-directed activity that occurs before a flight segment without an intervening required rest period is considered part of a flight duty period; but such time is not to be included in any determinations of performance against cumulative duty limits.

§ 117.31 Operations into unsafe areas.

“ (a) This section applies to operations that cannot otherwise be conducted under this part because of unique circumstances that could prevent flightcrew members from being relieved by another crew or safely provided with the rest required under § 117.25 at the end of the applicable flight duty period.

(b) A certificate holder may exceed the maximum applicable flight duty periods to the extent necessary to allow the flightcrew to fly to a destination where they can safely be relieved from duty by another flightcrew or can receive the requisite amount of rest prior to commencing their next flight duty period.

(c) The flightcrew shall be given a rest period immediately after reaching the destination described in paragraph (b) of this section equal to the length of the actual flight duty period or 24 hours, whichever is less.

(d) No extension of the cumulative fatigue limitations in § 117.3 is permitted.

(e) If the operation was conducted under contract with an agency or department of the United States Government, each affected air carrier must submit a report every 60 days detailing the –

(1) Number of times in the reporting period it relied on this section to conduct its operations.

(2) For each occurrence,

(i) The reasons for exceeding the applicable flight duty period;

(ii) The extent to which the applicable flight duty period was exceeded; and

(iii) The reason the operation could not be completed consistent with the requirements of this part.”

Comment: While it might not be initially obvious why the RAA member airlines would have a potential interest in this section of the Proposed Amendment, operations to rapidly remove or recover aircraft and crews from an airport about to be impacted by a heavy storm (hurricane, blizzard, ice, etc.) might require operation under this section.

The only comment of note that we would make regarding the language of this section relates to subsection (d), which states that

“No extension of the cumulative fatigue limitations in § 117.3 is permitted”.

This language is problematic on several levels:

- § 117.3 of the Proposed Amendment is devoted to definitions, offers up no limits on anything, and doesn't even include “*cumulative fatigue limitations*” in its table of defined terms;
- The term “*cumulative fatigue limitations*” is found nowhere else in the NPRM ;

- Even if the term/concept was to be found/used elsewhere in the Proposed Amendment, there would seem to be no reason why a flightcrew member would be allowed under this section to “*exceed the maximum applicable flight duty periods*” (by which we presume is meant the Table B maximum allowable flight duty period length) to remove his/her aircraft from the path of a hurricane but have to sit out the storm because he would otherwise exceed a 672 consecutive hour limit or some such.

Recommendation: That this language be reviewed and corrected as may be necessary based on its intent, which is not currently clear, and that the resulting language exhibit a greater degree of logical consistency than is the case of the current language.

Potential Future Applicability of the Proposed Amendment to Part 135 Operations

While the majority of RAA member airlines operate services under part 121, there also are several member airlines whose operations are conducted under part 135. The NPRM preamble material statement that “*In addition, part 135 certificate holders should pay close attention to both this NPRM and any final rule. This is because part 135 operations are very similar to those conducted under part 121, particularly part 121 supplemental operations... Accordingly, the part 135 community should expect to see an NPRM addressing its operations that looks very similar to, if not exactly like, the final rule the agency anticipates issuing as part of this rulemaking initiative.*” leads to the following comments.

It should be noted that there are significant differences in “on-demand” Part 135 Operations and “Scheduled” Part 135 Operations. At least one RAA member airline provides separate services under both a part 121 certificate and a part 135 certificate. The part 135 certificate services involve a fleet of more than 60 aircraft in regularly-scheduled operations, with up to 600 flights per day in six different geographic regions. There should be no doubt that any fatigue-related issues that might currently be present in this type of operation need to be found and addressed. It is just as important to address fatigue mitigation in the operations of smaller part 135 aircraft as it is to address fatigue mitigation in the operations of larger part 121 aircraft, as the safety of crewmembers and passengers is equally important no matter how many individuals may be occupying a particular aircraft.

There are, however, fundamental differences from part 121 operations in the missions and profiles of part 135 operations. For instance, we would hope that the FAA would consider certain unique aspects of part 135 flying while drafting part 135 flight and duty time regulations. While the total length of the duty days might be similar for part 135 in part 121 operations, provisions for reducing hours on duty based high numbers of legs flown in part 135 operations might not fit the same criteria as part 121. Part 135

scheduled carriers, for instance, can routinely fly as many as fourteen 20 minute legs, with 15-30 minute turn times between legs. Limiting the number of legs than can be flown by a part 135 flightcrew member in a duty day to seven or less, and thereby reducing the duty day for these pilots as a result would be counterproductive, as cumulative fatigue in this type of flying is substantially different than in operations in larger, more complex aircraft with, on average, substantially longer stage lengths. The NPRM preamble material itself notes that there is “*no evidence that flying multiple legs contributes to fatigue.*”

The net result of a rule that would limit part 135 operations to a substantially reduced number of legs and to foreshortened duty days would be to increase the total number of days that a pilot would be inclined to fly in order to gain as much flying or duty time (depending on the carrier) and flight pay as possible. In such a case, fatigue would not be an issue by the shortened duty days, but rather by the total number of days that a flightcrew member would be flying per month, causing a substantial negative effect on flightcrew member fatigue.

RAA Member Airline Answers to Questions Posed in the NPRM Preamble Material

The NPRM Preamble material included 35 questions regarding the regulatory directions underlying the Proposed Amendment, seeking commenter input with regard to those questions to assist in determination of the final rule. RAA member airlines’ answers to those questions and the considerations and analysis supporting those answers are fully presented in the voluminous comments above. Presented below are brief summaries of those answers, considerations and analyses.

1) Please comment on adopting maximum FDPs. Should the maximum FDP vary based on time of day? Should it vary based on the number of scheduled flight segments? Should the proposed limits be modified up or down, and to what degree? Please provide supporting data.

Answer: Yes to both questions. Varying the maximum regulatory FDP based on time of day is an acceptable construct and in accordance with current understandings in fatigue science. Similarly, varying maximum FDP based on the number of scheduled flight segments is also acceptable, again based on current understandings in fatigue science. The FDP limits detailed in Table B of the Proposed Amendment, however, need to be adjusted generally to the values submitted by the ARC as detailed in Table A(2) of the NPRM Preamble. Presented above in our comments and recommendations to § 117.15 are the fatigue science justifications and supporting considerations for this change. This recommended change to proposed Table B is better matches the regulatory limits to

currently known fatigue science and is a reasonable and necessary step to reduce the excessive conservatism that has been built into the Proposed Amendment (see Item 3 under Broad Topics of RAA Member Airline Concern with the Proposed Amendment above).

2) *Please comment on permitting flightcrew members and carriers to operate beyond a scheduled FDP. Is the proposed 2-hour extension appropriate? Is the restriction on a single occurrence beyond 30 minutes in a 168-hour period appropriate? Should a flightcrew member be restricted to a single occurrence regardless of the length of the extension? Please provide supporting data.*

Answer: No. There should be no limit preventing flightcrew members and carriers from accepting an extension of any length to a scheduled FDP provided such extension does not result in the actual FDP extending more than 2 hours beyond the maximum FDP established by Table B (after revisions are made to that table as described in the answer to Question 1 above). The proposed restriction to a single occurrence beyond 30 minutes in a 168-hour period should be dropped from the regulation, as it is an unnecessary approach (apparently attempting to ensure that necessary rest is provided) to something that is already well provided for in the proposed maximum FDP limits and the new rest regulations, and will drive actions in normal airline operations that will cause more disruption and change to other crew duty and rest schedules than it seeks to prevent for the instant crew's duty and rest schedule (see § 117.15 above). It also seems to go against the science outlined in the NPRM. The NPRM states that any sleep cycle should reset a flightcrew member's condition and should allow that flightcrew member to be rested enough to safely operate an aircraft; however, by limiting a flightcrew member to a single extension in any 168-hour period, the proposed regulation is stating that the extension has caused fatigue from which the flightcrew member cannot recover for 168 hours. Limiting the number of extensions in this manner goes against the science that underlies the new FDP and rest rules.

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?*

Answer: No. As discussed very extensively in our comments and recommendations (see § 117.9 above), the schedule reliability regulatory construct and the reporting requirements in the Proposed Amendment related thereto are totally and seriously at odds with the way that schedule reliability numbers occur and can be controlled in daily airline operation, making adding a scheduled FDP exceedance reporting requirement to this section of the regulation totally unworkable and unlikely to provide any meaningful data helpful for fatigue mitigation. A typical example presented in detail in our comments above showed that over 90% of the crew pairings for the November 2010 schedule of an RAA member airline operate only a single time. Thus reliability statistics relative to exceedances of scheduled FDP for this airline for November will show either 100%

reliability or 0% reliability for 90% of its individual crew pairings – likely leading to a very large reporting requirement but not likely leading to any actionable determinations.

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

Answer: No. As discussed in our comments and recommendations (see § 117.9 above) and in our answer to Question 3 above, the schedule reliability regulatory construct and the reporting requirements in the Proposed Amendment related thereto are totally and seriously at odds with the way that schedule reliability numbers occur and can be controlled in daily airline operation – they underlying deficiencies in this section of the Proposed Amendment need to be resolved before consideration is given to adding more parameters and confusion to an already unworkable proposed process.

5) *What should be the interval between reporting requirements?*

Answer: See answers to Question 3 and Question 4 above.

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

Answer: See answers to Question 3 and Question 4 above, but also note that the environmental and marketplace factors that lead to quite normal variances in day- to-day operating performance around the planned/published schedule are themselves driven by day-of-week and seasonal patterns (weather, volume of flights, numbers or passengers, airport construction, etc., etc.), so that anything that might be learned from an analysis of the failure of a specific crew pairing in a given month may have very little or nothing to say about the performance of that same pairing (should it in fact be repeated, which is a low percentage event in its own right) in the following month or the next following month

7) *Is a 3-day adjustment to a new theater of operations sufficient for an individual to acclimate to the new theater?*

Answer: No opinion – not applicable to RAA member carrier operations.

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

Answer: No opinion – not applicable to RAA member carrier operations

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?*

Answer: No opinion – not applicable to RAA member carrier operations

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?

Answer: No opinion – not applicable to RAA member carrier operations

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?

Answer: No. The regulations are complicated enough (too complicated) as they are currently proposed and this further complication is not needed for nor would it add anything to the mitigation of flightcrew member fatigue that isn't already well handled (over handled) by the Proposed Amendment as presented in the NPRM.

12) If the FAA adopts variable FDP limits, is there a continued need for daily flight time limits?

Answer: Absolutely not. As extensively detailed in our comments and recommendations (see Item 2 under Broad Topics of RAA Member Airline Concern with the Proposed Amendment and § 117.9 above), with a properly constructed set of FDP limits, not only is there no need for daily flight time limits, their presence on top of all of the other new limitations included in the Proposed Amendment risks creating a regulatory analysis/paralysis problem for individual flightcrew members and certificate holder operations management personnel alike.

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

Answer: No. As there is no scientific basis presented in the NPRM Preamble material for any daily limits to flight time, and since such limits were specifically rejected as a fatigue control and mitigation concept by both CASP-371 and the EASA regulations, there is no basis whatsoever to support either upward or downward changes to a limit that is unsupported in its own right.

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?

Answer: No. Since no scientific basis was presented in the NPRM Preamble material specifically relating fatigue to the number of flight segments operated (all that was noted in the NRPM on the subject was that the ARC discussions regarding FDP limits “*reduce the amount of FDP once a flightcrew member has flown more than four legs*”), and since flight time limits themselves were specifically rejected as a fatigue control and mitigation concept by both CASP-371 and the EASA regulations, there is no basis whatsoever to

support either upward or downward changes to a limit that is unsupported in its own right.

15) Should augmentation be allowed for FDPs that consist of more than three flight segments? Does it matter if each segment provides an opportunity for some rest?

Answer: No opinion – not applicable to RAA member carrier operations

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?

Answer: No opinion – not applicable to RAA member carrier operations

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.

Answer: No opinion – not applicable to RAA member carrier operations

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

Answer: No opinion – not applicable to RAA member carrier operations

19) Are the proposed required rest periods appropriate?

Answer: No opinion – not applicable to RAA member carrier operations (in so far as this question relates to augmented operations).

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

Answer: No opinion – not applicable to RAA member carrier operations

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 such as a multi-bed crew sleeping facility or multi-bed living quarters. Please provide supporting data.

Answer: Yes. Single occupancy rest facilities do provide a better opportunity for sleep. There is significantly less opportunity in a single occupancy rest facility for one or another of the occupants' rest habits to impact the other opportunity for the other occupants to gain meaningful rest.

22) *Should there be any restriction on consecutive nighttime operations? If not, why?*

Answer: Yes, but not at the 3-night restriction established by the Proposed Amendment. The currently proposed 3-night limitation should be raised to 4 nights, as a 3-night limitation will have the unintended consequence of making it necessary to schedule a greater number of flightcrew members to mixed day and night flight assignments, causing a relatively less safe increase in first-day assignments to nighttime operations (see § 117.27 above).

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?*

Answer: Yes. When a nighttime duty period not providing the sleep opportunity contemplated under the split duty provisions of this notice is assigned to a flightcrew member, the length of that duty period must, by this notice, be reduced in accordance with the Table B limitations. The shortened allowable flight duty period thereby provides longer daytime sleep opportunities for the assigned flightcrew member, bringing with it a greater opportunity for acclimatization to such overnight duty. The 3-night limitation in such cases should be increased to a 4-night limitation.

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?*

Answer: Yes to both questions:

- The proposed § 117.17 language appropriately permits the extension of nighttime flight duty periods for flightcrew members who have been “*given a minimum [split duty] opportunity to rest in a suitable accommodation of 4 hours, measured from the time the flightcrew member reaches the rest facility.*” However, as detailed in our discussion above regarding § 117.17, the extended flight duty period should not be limited to 12 hours as proposed but rather should be solely determined by adding 50% of the time in a suitable accommodation to the Table B maximum FDP limit.
- The proposed § 117.27 language appropriately excludes from the “*three consecutive nighttime flight duty periods*” limitation where “*the certificate holder provides an opportunity for rest during the flight duty period in accordance with § 117.17.*”
- Both of these Proposed Amendment provisions are supported by the fatigue mitigation benefit recognized as inherent in the split duty “*opportunity to rest in a suitable accommodation*”, thereby removing any undue fatigue risk from either nighttime FDP extensions or the operation of more than three consecutive nighttime FDPs.

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?*

Answer: Yes and No. As indicated in the answer to Question 22 above, the 3-night consecutive nighttime operations limitation should be increased to a 4-night limitation. This should, however, be done without the additional 14-hour rest period as proposed in this question.

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.*

Answer: Before presenting the RAA member airlines' answer to this question, it is important to specify the two contexts in which that answer is offered:

- We believe that the question means to refer to “*sort call reserve*” rather than “*long call reserve*”, and our answer below is offered in that context (see highlighted portion of question above); and
- The RAA member airlines absolutely disagree with the Proposed Amendment's characterization of short call reserve availability periods (RAPS) as “*duty*”, the reasons for which position are amply presented in our comments with regard to § 117.21 above.

The question of setting maximum RAP limits was discussed extensively in the NPRM Preamble material - see Tables E(1) and E(2) - and such limits were the subject of considerable discussion by the ARC. Setting aside for the purpose of argument that the RAA member airlines disagree with characterizing time in a RAP as duty, there is a logic to making the RAP limit higher than the maximum FDP limit for a lineholding flightcrew member. While it is assured that a lineholding flightcrew member will be performing duty for the company on the company's aircraft/ premises during his/her assigned FDP, a short call reserve flightcrew member may or may not be spending none, some or all of his RAP performing duty for the company and the time not spent in company duty will be spent in a place of the reserve flightcrew member's own choosing (home, crash pad, etc) where he/she has relative control of his/her own life and personal preparations for duty. The level of fatigue normally associated with a reserve assignment will generally be well less than the fatigue normally associated with acting as a flightcrew member in line operations, allowing a RAP to be longer than a lineholder's FDP without any sacrifice to fatigue-state or operational safety.

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.*

Answer: No opinion – not applicable to RAA member carrier operations

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

Answer: Yes. As discussed by the ARC.

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.*

Answer: No. The rest regulations and limitations in the Proposed Amendment are fully sufficient to mitigate the buildup of fatigue for lineholding flightcrew member and reserve flight crewmember alike. This position is further supported by the numerous times that a reserve flightcrew member can expect not to be called to duty at all. .

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

Answer: While the rest proposal is relatively straight forward, it nonetheless should be further simplified by removal of the entire RAP shift discussion and its restrictions, which are unnecessary in light of the rest regulations and limitations in the Proposed Amendment and counterproductive to fatigue mitigation and the minimization of disruption to crew schedules broadly across all flightcrew members.

One simple example of where the proposed limitations on shifting RAPs are counterproductive to schedule stability and fatigue mitigation might be the not unusual case where a reserve flightcrew member assigned to a critical sequence of consecutive day early morning short call RAPs calls in sick. Under the NPRM's proposed limitations for shifting RAPs, the carrier will be forced to spread the assignment of the now-uncovered RAPs amongst many reserve flightcrew members, creating significant disruption and inconsistency to any number of reserve schedules. The much better course of action would be reassignment of the sick flightcrew member's entire block of RAPs to a single reserve flightcrew member whose planned reserve assignment involved a less critical series of RAPs. In this way, only one reserve flightcrew member would be impacted and overall RAP consistency and rest schedules would be better maintained. There are many more such examples that could be cited. Reserve assignments and the arising day-to-day needs to carefully shift those assignments deals in very complex scarce resource management issues, and each certificate holder's flight schedule creates its own unique situations. Beyond making sure that flightcrew members with reserve assignments receive required rest as their RAPs and reserve usage may be changed to meet the reasonable needs of the day-to-day operation, the FAA would be better to leave reserve scheduling as a labor management issue.

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? Should there be more limits (e.g., biweekly, or quarterly limits)?*

Answer: No to both questions. If one of the goals in rewriting the Flight and Duty rules was simplification, that effort failed when it comes to the number of distinctly different limits proposed and especially with regard to the cumulative limits proposed. It hardly seems necessary to have a regulation with eight separate and distinct limits in various duty and hour categories. As discussed in our comments and recommendations (see Item 2 under Broad Topics of RAA Member Airline Concern with the Proposed Amendment and § 117.9 above), there is absolutely no scientific or regulatory need for flight time limits. As also discussed in our comments and recommendations (see § 117.23 above), there would seem to be no need for Total Duty Period limits as distinct from Flight Duty Period limits.

With respect to the slices of time for which cumulative limits are proposed (28 consecutive days, 365 consecutive days, 168 consecutive hours, 672 consecutive hours), these are also excessive. Nowhere in the NPRM Preamble materials is a scientific case made that there is an unresolved fatigue load created when a flightcrew member's schedule adheres to the 168 consecutive hour limit that must be corrected through a 672 consecutive hour limit. And the same can be said for annual limits. Unless such a case can be made, there should be no need for consecutive hour limits beyond the rolling 168 consecutive hour limits included in the Proposed Amendment. Any cumulative limits beyond those required by fatigue science are essentially lifestyle consideration that should appropriately be left for airline/union collective bargaining agreements to resolve.

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?*

Answer: No. Moving to limits based on consecutive hours (168 consecutive hours and 672 consecutive hours) and away from the traditional basing of such limits on days (7 days and 28 days) may bring a charming scientific exactitude to the process but it makes individual flightcrew member tracking of his/her compliance (a joint flightcrew member/certificate holder responsibility - See Item 1 under RAA Member Airline Areas of Support for the Proposed Amendment above) unnecessarily difficult (see § 117.23 above). While most individual flight crew members can be expected to count back the number of days (with a calendar or on their fingers?) to personally track their compliance while in the cockpit, not many will be able to consistently and without added stress be able to confirm when 168 or 672 consecutive hours was. There would seem to be no necessary purpose served by the change from consecutive day tracking to consecutive hour tracking and the change brings with it considerable added difficulty in being able to confirm compliance at the individual flightcrew member level.

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

Answer: No.

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?*

Answer: Yes. The RAA member airlines have long and strongly supported the use of voluntary disclosure programs and non-punitive safety reporting programs as the most effective and rapid way to raise otherwise unseen compliance and/or safety issues and to get such issues addressed in a timely and constructive manner.

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?*

Answer: No.

FAA Response to Clarifying Questions Question:

Question: *There may be instances in which the certificate holder could determine that an FDP would go beyond what was originally scheduled, but could be rescheduled and still remain within the limits of Table B (or Table C in the case of augmentation). The FAA did not consider that circumstance and seeks input on whether that should be allowed, and if so, with how much advance notice.*

Answer: The RAA member airlines find it wholly appropriate that a FDP period not initially scheduled at Table B limits should be allowed extension even up to those limits for reasons that might develop in the operation. Any such extension would have to be in compliance with the rest and duty period requirements of the Proposed Amendment but, quite frankly, they happen every day in normal operations. To suggest otherwise is not to understand the normal daily abnormality of airline operations – writing a schedule down on paper does not mean that an aircraft, operating in the absolutely normally complex air traffic, weather, airport congestion etc., etc. environment can read and adhere to the dictates of that paper.