



High Confidence

BY WAYNE ROSENKRANS



**FSF-NBAA task force updates guidelines
for duty/flight time and rest in business aviation.**

Duty/Rest Guidelines 2014 for Business Aviation — a free, three-part digital document set for release in mid-April — answers the clamor from U.S. business aircraft operators and pilots for fresh expert advice on this critical subject, the authors say. It's the product of six months of research and development, and three additional months of editorial refinement, by a fatigue task force formed in July 2013 by Flight Safety Foundation and the National Business Aviation Association (NBAA).

The task force essentially reconsidered this industry sector's long-used, voluntary practices for managing duty time, flight time and rest in light of the latest operational needs and advances in the science of fatigue, says Leigh White, president of Alertness Solutions, who chaired the task force.

The centerpiece of this document in Adobe Portable Document Format (PDF) is two one-page tables of currently recommended hours for maximum duty period, maximum flight time and minimum off-duty period for augmented and nonaugmented flight crews. The task force expects numbers in these tables to be implemented by business aircraft operators only in their context of extensively updated/rewritten definitions of terms and explanatory guidelines, available online at <flightsafety.org/dutyrest>. A new foreword introduces the overall content.¹

White considers *Duty/Rest Guidelines* a complete and direct replacement for *Principles and Guidelines for Duty and Rest Scheduling in Corporate and Business Aviation*, published in February 1997 by the FSF Fatigue Countermeasures Task Force.² "Among our other goals for this document was providing a useful tool that is practical, and easy to understand and to implement," she said.

"These guidelines hopefully will set the cornerstone — but only one cornerstone — of every fatigue management effort in this sector of aviation, with both its design and recommendations easily incorporated into any operator's flight operations manual. Our industry is not being force-fed these guidelines — operators and pilots are asking for them, and we've been highly motivated to give them something they can use."

Clear and Simple

The task force's scientific panel and an industry panel (leading operators and experts in business aviation) collaborated during the research, development and revalidation phase to reach consensus on what to update, White said. The result incorporates science on par with the expertise behind the latest changes in fatigue management within U.S. commercial air transport. In short, the panels "focused on how nearly two decades of scientific advances should influence today's recommended practices for duty and rest scheduling while meeting the safety and operational goals of the general aviation community," she said.

"Another intent of our project was to consider whether the existing guidelines still provide a sufficient safety margin for current flight operations. To answer that question, our subject matter experts studied the relevant global accident and incident experience during the period since the 1997 publication. Our scientific explanations are refined from 1997 and in plain language. Elements of fatigue management are described, and we show operators where the *Duty/Rest Guidelines* fit within their overall fatigue-management efforts and what to do if an operator is required to operate outside of the guidelines."

The easy-to-interpret tables show, assuming a 24-hour period, the maximum number of duty hours and flight hours, and the minimum rest hours and intervals for ready comparison to operators' existing policies and flight operations manual. "The values remain fully consistent with current scientific knowledge and operational experience," White said. "We verified that the numbers make sense scientifically and operationally, and then the narrative body of the document provides the context. What's really fresh and new about this document compared to the 1997 publication is that context. This has got to be a living document reviewed or revisited every five years or so, at least to have the numbers verified and new research applied. With IBAC [the International Business Aviation Council] and ICAO [the International Civil Aviation Organization] involved, there will be a drive to keep these fresh."

A good example of the influence of fatigue-science advances upon *Duty/Rest Guidelines* is the document's intensified emphasis and updated explanation of effects of the *window of circadian low* (WOCL) — roughly 0200 to 0600 (for individuals adapted to a usual day-wake/night-sleep schedule) when the body is "programmed" physiologically to sleep and during which alertness and performance are degraded. This subject had been introduced in the original publication. "Over the last 16 years, more has been learned about what happens operationally with both of the main fatigue factors: window of circadian low and hours of wakefulness," White said. "Those are the two main physiological factors that come into play in these guidelines or in any duty/rest scheme today. Certainly, more has been learned about encroachment on the WOCL, and this

has heightened awareness. We really do know more about how to manage this risk operationally now than we did in 1997, and confidence in the new guidelines' effectiveness came through in our scientists' voices."

Readers familiar with the 1997 publication will find differences in definitions of a number of terms and elimination/replacement of some content. "The thing that gives *Duty/Rest Guidelines* 'legs' [i.e., global applicability] is IS-BAO [the International Standard for Business Aircraft Operations]," she said, which operators have been motivated to adopt for diverse reasons such as potential issues of legal liability, safety enhancements, commercial advantages of registration and the acquisition of long-range business jets.

Globalization factors similarly influenced the alignment of definitions for consistency with those in the upcoming fatigue management implementation guide for general aviation to be issued jointly by the Foundation, ICAO and IBAC. In fact, *Duty/Rest Guidelines* as a standalone PDF will be temporary, she added. Plans call for the document's entire content to be incorporated permanently into the new implementation guide.

Kevin Gregory, vice president and senior scientist, Alertness Solutions, said that regular review of the validity of recommendations, including the strengthening of some elements and the discarding of others, in *Duty/Rest Guidelines* also is consistent with many operators' safety management principles.

As someone who also had a hand in developing the original publication, he recalls that in the mid-1990s, the whole idea of applying duty/rest principles and recommendations from U.S. National Aeronautics and Space Administration research to business/corporate aviation felt like venturing into uncharted

territory. The effort called for heavy emphasis on convincing operators about the value of scientists' work and the data-driven problem solving.

"In a lot of ways, this was new ground even though there had been discussions already ongoing for many years about a need to update the air carrier duty and rest guidelines at the FAA [U.S. Federal Aviation Administration] level," he said. "We were saying, 'Here's this report — but it's really a starting point' to get people thinking ... to motivate them to incorporate the 1997 guidelines into operations. Now we feel that the industry, to a large extent, is much more aware, more sophisticated in recognition of fatigue issues and risks that they need to address."

Operation of long-range business jets, some capable of 16-hour flights, ideally should not be the primary motivation for an operator to adopt the document. "Let's not lose sight of the fact that these principles are just as relevant in other types of operation — such as many short-haul flights during a 14-hour duty period — that can be as challenging from a fatigue perspective," White said.

The 1997 publication unquestionably became accepted as a voluntary

standard within business aviation, and one especially used by auditors, she said. It has been widely considered the starting point of best practices in flight departments, and auditors typically would inquire during the exit briefing about the operator's rationale and risk mitigations in case of deviations. "Absolutely, there was an impact from the original publication, and I think that the newly refreshed document similarly is going to have a significant impact," she said.

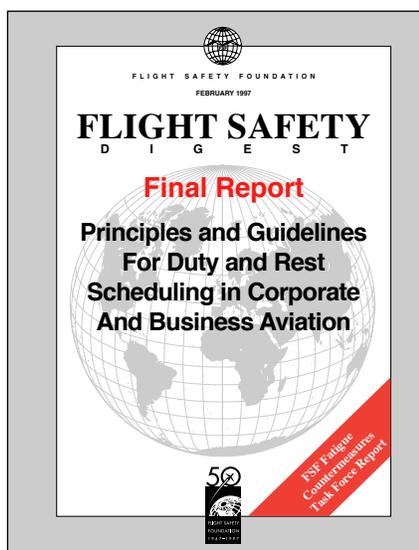
Transition to 2014 Version

Various pathways for operators' transition from the now-outdated publication to *Duty/Rest Guidelines* can be effective, the creators advise. However, White suggests that operators first categorize themselves — as the new guidelines suggest — as either the type of operator conducting nominally simple flight operations or as the type of operator conducting complex/irregular flight operations that exceed the guidelines. Step one, for both types, should be to compare the tables with the operator's existing policy and flight operations manual.

"Then it's really important, as an operator, to think about what you actually do," she said. "If you're getting any kind of fatigue reports or you're gathering any kind of fatigue information, take a look and see if you're doing something that exceeds what these recommendations lay out."

In the case of simple operations, the operator next should revise training to conform to the first step, White said. "Implementation plus training, combined, equals fatigue management in simple operations," she said.

"As your operations get more complex, as you start pushing/exceeding these guidelines, you need to do active fatigue management, which means looking to see where it is in your operations



that you exceed the recommendations. Then you actively manage with fatigue reporting, enhanced training, procedures in place, talking about mitigations for flight risks and awareness. So we introduce in the last section of *Duty/Rest Guidelines* what fatigue management means if operators are going to choose to fly outside these recommendations.” The FSF-ICAO-IBAC implementation guide now being completed will add more detailed recommendations for such operators.

The point is to recognize any operational demands to perform unusual/irregular flight operations, then to document the risks, and finally to design and implement appropriate mitigations using *Duty/Rest Guidelines*. “For example, include in your manual what happens when you approve — but then exceed — a selected duty extension, or if you have to plan a flight outside of the guidelines,” White said. “Have some documented procedures, and then include all of this information about mitigations and exceedances in your annual training. Then pay attention with ongoing monitoring as you are doing operations that exceed these recommendations. Collect fatigue reports, have some post-trip briefings — something so that you can pay attention to the outcomes.”

A key advantage of the new document’s endorsement by ICAO and IBAC will be its status going forward as part of the IS-BAO standard. “When auditors are trained, they’ll have this template, and they’ll be able to look at an operator’s flight operations manual and fairly quickly assess the fatigue-management effort,” she said. “If they’re not exceeding those guidelines, then the only other basic thing they need to be doing is training. The auditors verify that the operator is doing the training, and they’re done. If the operator is exceeding these guidelines, the auditor can look at the mitigations and other fatigue-management steps that they can easily audit.”

Among elements eliminated/replaced during the update, most involved making terminology easier to grasp for non-scientist users, more concise and more operationally focused. “Since the 1997 guidelines, scientists have been working in the industry more operationally,” White

said. “We were acutely aware that our audience is the operators. The scientific terminology related to operations is more consistent now.”

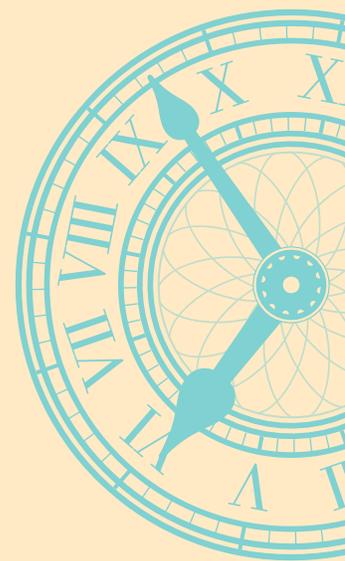
A second reason for elimination/replacement was relevance to today’s operational settings, and a third reason was the need for conformity to terms now used in fatigue-related materials intended for international use. “The concepts are still there — they’re just described in a way that’s, hopefully, more accessible,” White said.

Duty/Rest Guidelines, by design, also contains some subtle references to quality of life benefits for pilots. White said, “We want as many people to read this document as possible. The way that fatigue risk management is framed by everybody now is that it is a joint responsibility. The operator has to do ‘these five things,’ and individuals need to hold up their end of the deal, too.”

In the final analysis, successful fatigue risk mitigation through large-scale voluntary practices hinges on buy-in from operators and pilots in the business aviation community, Gregory added. “We’re saying, ‘There are benefits for you here as well,’” he said. “You’ve just been out flying to Asia and you’re back for a week. Here’s how quickly you’re going to adapt so that you can enjoy your time with your family at home.’ Operators have got to find a way to show that there’s a benefit to the individuals as well as the organization.” ➔

Notes

1. In addition to the two tables and foreword, *Duty/Rest Guidelines* covers, in part, an introduction to fatigue management; active fatigue management; objectives and limitations of the guidelines; recovery period; time-of-day and circadian physiology; individual differences; latest recommendations to operators; WOCL operations; off-duty period, sleep opportunity and recovery opportunity; time-zone changes; duty period; standard flight time and extended flight time; non-augmented and augmented operations; cumulative duty/flight limits; standby; fatigue countermeasures; predeparture protected rest; controlled rest on the flight deck; restorative breaks; operator best practices; fatigue-reporting systems; and how to obtain further detailed guidance.
2. The original *Principles and Guidelines* publication is still available at no cost from the FSF website at <flightsafety.org/flightsafety.org/fsd/fsd_feb97.pdf>.



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