THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

FATIGUE
The Importance of Proper Rest

The Navy & Marine Corps Aviation Safety Magazine

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Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous enough; the time to learn to do a job right is before combat starts.

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CON

Features

This issue looks at fatigue, our No. 1 aeromedical causal factor in mishaps.

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Photo by JO1 Paul G. Scherman. Modified.

FATIGUE

September-October Thanks

Thanks for helping with this issue. . .
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The Initial Approach Fix

Focus on Fatigue

Q. What is the most frequently-cited aeromedical causal factor in naval aviation mishaps?
A. Fatigue

Fatigue is more insidious than hypoxia, loss of consciousness, dehydration, and even spatial disorientation. This issue of *Approach* takes a look at fatigue, and includes valuable information from our aeromedical experts. We're including a safetygram from VFA-32, and several "There I was" stories to reinforce the need to not just recognize fatigue, but to prevent it. When you consider that fatigue is four times more likely to contribute to workplace impairment than drugs or alcohol, it's not just a problem for aviators, but for everyone in the aviation community.

Know the crew rest instruction in OPNAVINST 3710.7T and follow its guidelines. Any mishap where fatigue is a causal factor is preventable—fatigue is a Blue Threat.

For more aeromedical information go to: www.safetycenter.navy.mil/aviation/aeromedical/

Culture Workshop

The Culture Workshop (CW) is a proactive leadership tool adopted by naval aviation to assist in mishap prevention following a series of high-visibility organizational mishaps in the early to mid-1990s. CW is a principle-based process that provides an in-depth and unvarnished look at how a command does business, with a focus on organizational human-factor hazard identification through the lens of the command's warriors.

Culture workshops:

- Provide a simple tool for commanding officers to evaluate their organizational culture for previously unidentified hazards that may pose risk to mission accomplishment.
- Positively influence the warrior ethos over the course of a generation (progression from E1-E9/O1-O9), to maximize the lethality of every dollar expended, preserve assets and lives, and make sure each member of the organization understands their relevance and importance to mission accomplishment in an era of ever-increasing fiscal constraints.

Proactive in nature, the CW is intended to afford the unit commander actionable items so that after the workshop, the leadership team can make midcourse corrections and implement control measures to facilitate continued operational excellence and mission accomplishment.

The CW is conducted over two days while the squadron operates normally. The CW is conducted for the commanding officer and all results stay within the squadron. COs have an opportunity to provide the Naval Safety Center an input as to what they are seeing as hazards and barriers to operational excellence. The top six hazards identified by COs over the past year are:

- High OPTEMPO
- Resource shortfalls and funding
- Communications up and down the chain of command
- Personnel shortages and lack of qualified personnel
- Complacency
- Personal misconduct (drugs and alcohol)

For more information and to schedule a CW for your command, go to the Naval Safety Center's culture workshop homepage at: www.safetycenter.navy.mil/culture/

For information about culture workshops contact:
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Aviation Statistics

The "Aviation Daily Summary" is a daily look at aviation mishap rates. This information and other statistical data is available at: www.safetycenter.navy.mil/statistics/.

Give This XO Some Rack Time

A Fatigue Scenario

Photo by Allan T. Amen

You've been in the Gulf awhile and are long overdue for your first port call. With great anticipation, you'll pull into port tomorrow for a well-earned, six-day visit, beer in the Sand Box, and all the other benefits of beach-side life. But one of your wing flight surgeons approaches you with a problem. Turns out that the new executive officer of the Dark Clouds is reporting aboard today, and the Carrier Air Group commander wants him to get his day carrier quals before going into port tomorrow.

Oh, by the way, the prospective XO just has traveled from CONUS, with a nine-hour transmeridian time shift. He has been up for the past 45 hours, except for four hours of sleep he snatched last night in the Dubai airport, before reporting aboard this morning. You and your wing flight surgeons suspect fatigue will be an issue, and it would be better to convince CAG to give this poor aviator a nap, instead of a day CQ.

"CAG, sir, I've heard that Cdr. (Roger) Ball arrived this morning by helo, and you plan to have him do his day CQ this afternoon. Are you crazy, sir?"

You explain what you know about fatigue physiology, sleep deprivation, circadian shifts, and the resulting performance decrement and increased risk of mishaps, but CAG tells you that: a) no, he's not crazy; he's CAG; b) that Cdr. Ball is a senior, experienced naval aviator, a great stick, and he can hack it, and that; c) this fatigue stuff doesn't apply to naval aviators, who are not made of mere mortal flesh.

Muttering under your breath, you retreat to your office and crank up the computer. You enter what you know about the XO's sleep schedule before he reported aboard, as well as the latitude and longitude of Norfolk (his point of origin), London (where he changed planes), and Dubai (his ultimate destination), nine time zones to the east. FAST automatically calculates this information, based on the coordinates of the origin and destination. You enter all times into the program, based on local time in Norfolk. When you enter the sleep period in the Dubai airport, you rate it as "poor," based on your extensive experience sleeping in airports. FAST gives a predicted performance plot for Cdr. Ball.

As you suspect, FAST predicts that Cdr. Ball is significantly fatigued, and at the time of his scheduled flight, he'll be about 55 percent of baseline effectiveness, and much worse than the equivalent legally intoxicated line of 0.08 BAC. FAST predicts the whole day the new XO is aboard ship, his performance will be more impaired than if he legally were drunk! You go back to CAG and give him the plot, showing your numbers.

"CAG, sir, you can put this information into your operational risk-matrix worksheet concerning Cdr. Ball's flight," and you harrumph off.

CAG, being an aviator, may ignore the best of medical advice, but he cannot ignore a number. He decides to postpone Cdr. Ball's day CQ until after the port call.

Editor's note—FAST is the Fatigue Avoidance Scheduling Tool. The *article on page 6 describes this valuable tool.*

Fatigue—A Root Cause

By Capt. Nick Davenport, MC

The mission of naval forces is to train continually in preparation for war, if not already so engaged. Technological advances and the ever-increasing capability of our machines and missions dictate more complex training scenarios and more highly educated and trained professionals in our service. We own the technology of the night, and strike when least expected. The modern Sailor, aviator, and commander must be energetic, intelligent, innovative, highly motivated, highly trained, and resourceful.

We spend unlimited hours and resources training, drilling and molding the minds of warriors. And yet, these minds do not always perform satisfactorily. Training mishaps and loss of assets take a much higher toll on our capabilities and readiness than enemy action ever did. We are our own worst enemy.

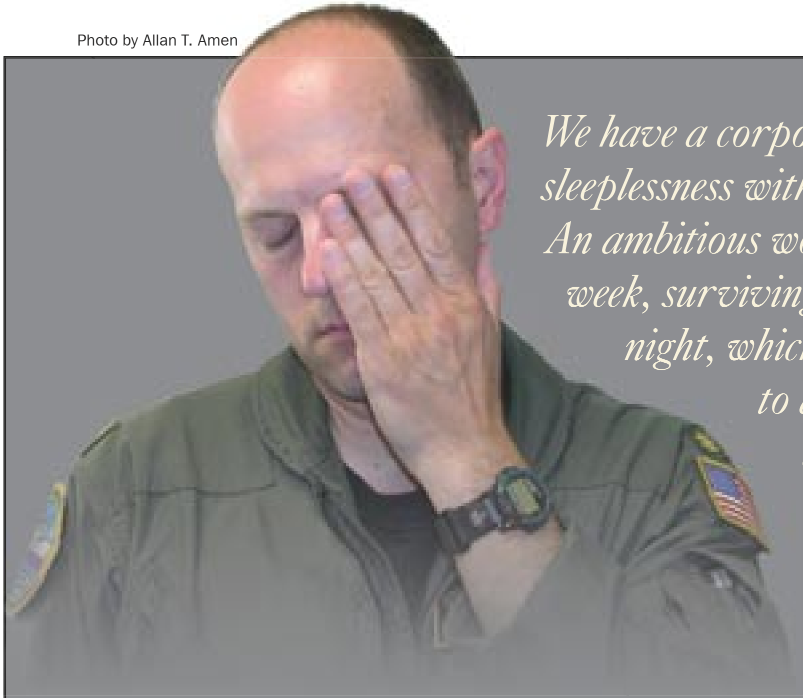
The mind of the successful warrior is simply the product of the human brain. As an organ of incredible complexity and wonder, it is only now beginning to yield its secrets to modern science. The brain is the most complex system in the known universe; yet, in its simplest description, it is nothing more that an electrochemical digital computer. The brain is another weapon system the war fighter must understand in sufficient detail for proficiency; yet, it's so familiar to us that we rarely consider it in such terms.

While awake, the healthy, well-nourished and rested human brain is capable of prodigious feats of sensory perception, symbol manipulation, logic, analytic thought, language, and problem-solving. However, because of its biologic nature, the brain cannot run continuously in the awake conscious mode, but requires scheduled maintenance and recharge cycles for efficient function. The awake functioning brain seems to deplete neurons and biochemical capability, build up toxins and metabolic by-products, and starts to run down. This "running down" is manifest as declines in mental performance, judgment, and complex decision-making, and is associated with a variety of symptoms we commonly experience as "fatigue."

We refer to the regular maintenance and recharge cycles that the brain engages in as "sleep." All animals studied show sleep behavior, cycling around a 24-hour interval. This condition is simply a product of our evolution and the orbital motion of this planet, and is inseparable from the fabric of our existence. Sleep is as necessary for survival as oxygen, water, and nutrition. Animals that cannot enjoy the luxury of unconsciousness during sleep, but must remain continually vigilant, such as porpoises, can switch their brains into sleep mode half-a-brain at a time, while still functioning sufficiently to avoid drowning.

Sleep activity consists of periods of deep, slow electrical activity known as "non-REM" sleep, alternating with periods of fast electrical activity during which the eyes are seen to move beneath the eyelids, hence the term "rapid eye movement," or REM, sleep. Dreams occur during REM sleep, but, in this phase, the brain, in essence, disconnects itself from the rest of the body, and with the exception of respiratory muscle activity, no signals are sent to the muscles of action, so dreams are not translated into body activity. The majority of non-REM sleep is obtained in the first half of the night's sleep, whereas REM predominates in the latter half of the sleep period. Depriving the brain of REM sleep by shortening the nightly sleep period from eight to six hours may significantly affect learning and retention. It is apparent that both are necessary for brain health and function, and if the human brain is deprived of either type of sleep, it actively will seek that type in greater amount. Inefficient or fragmented sleep will result in increased fatigue levels and, again, declining performance.

All this fatigue and sleep physiology would be of mere academic interest to the war fighter were it not for the simple fact the sleep-deprived and fatigued brain suffers increasing performance deterioration as sleep deficits accrue. The signs and symptoms evident in individuals in a fatigued state include deterioration in mood, impairment in complex reasoning and decision-making, Photo by Allan T. Amen



We have a corporate culture that still confuses sleeplessness with vitality and high performances. An ambitious worker logs 80 hours or more each week, surviving on four to five hours of sleep per night, which induces an impairment equivalent to a blood alcohol content of .1. The analogy of sleep deprivation and drunkenness is a fair comparison because, like a drunk, a person who is sleep deprived has difficulty assessing how functionally impaired they truly are.

increased tolerance for error and risk, task fixation, reduced communication, reduced vigilance and motivation, and increased reaction times.

As the pressure for sleep increases, the brain will unpredictably try to insert snatches of sleep: lapses or microsleeps. These typically last five to 15 seconds or longer, during which the individual even may appear awake with eyes open but actually is asleep. The brain has switched to sleep mode and is not processing external stimuli. Performance deteriorates because of fatigue, but during these lapses, performance drops to **zero**. These lapses become more frequent as fatigue accumulates. What's most dangerous is that individuals are often unaware of them. External events, such as radio calls, warning lights, sudden threats, or mandatory responses aren't processed during lapses. Fatigue produces predictable declines in performance, interspersed with sudden lapses, an especially dangerous combination of deficits where vigilance is required.

It would be understandable for the war fighter to respond, "So what? We have to train and fight wars in a fatigued state, and we manage to deal with it. We can't eliminate fatigue. Crews must be vigilant and capable 24 hours a day. Wars are fought at 0400. The luxury of eight hours of sleep a night can't be afforded in the military. If the problem is so serious, where's the evidence?"

Our culture, especially in the military, holds that somehow training, habit, motivation or attitude can overcome fatigue. Mishap statistics suggest otherwise.

As part of many mishap investigations, particularly aviation mishaps, we routinely measure for glucose, alcohol, drugs, carbon monoxide, lactic acid, cyanide, and a variety of other biological markers and agents, both in the living and the dead. But, we have no good measure for fatigue, so we've historically missed it as a causal factor.

It's time to change the culture in the Navy regarding sleep deprivation and fatigue. We never would tolerate the profound deterioration in performance that would result if a large number of our personnel routinely were intoxicated on duty; yet, we accept the same levels of impairment in performance from fatigue without recognition. In fact, our military culture often rewards sleeplessness as a badge of honor. Fatigue is so prevalent and such a part of our culture we scarcely see or recognize it. It's the big gray elephant we muscle out of the cockpit when we fly, step around when we enter the bridge, and push aside when we peer into the periscope.

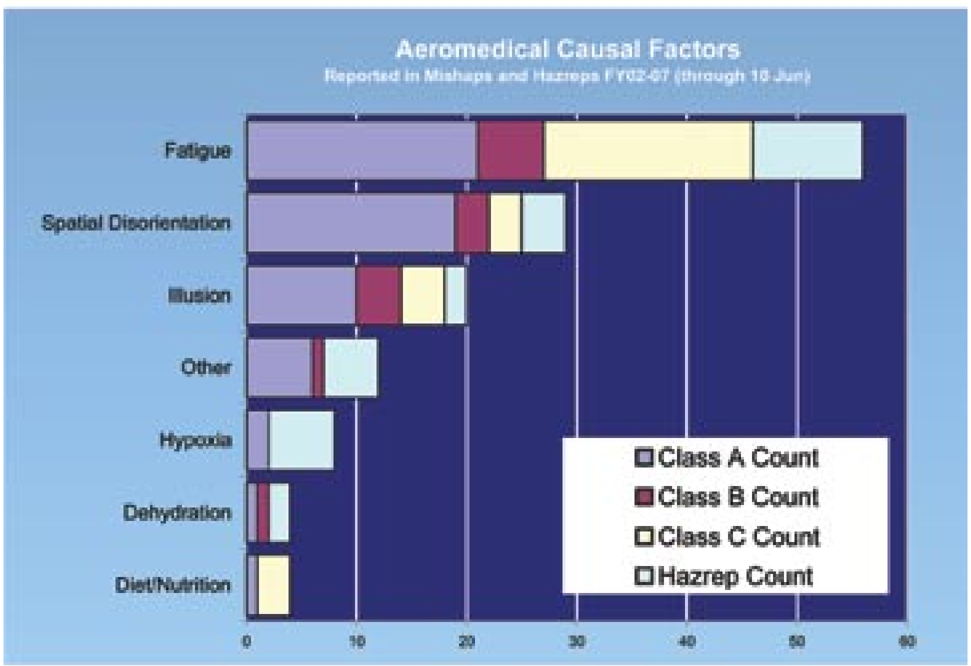
The war fighter is right: We cannot eliminate fatigue. But, we increasingly have sophisticated tools and scientific evidence to recognize the true cost of fatigue on naval operations. We can provide the commander with better risk-assessment strategies and countermeasures. Perhaps, we don't need more training, more discipline, more regulation, more safeguards, or bigger instructions. Perhaps, we just need more sleep.

Capt. Davenport is the command flight surgeon, School of Aviation Safety, Naval Aviation Schools Command.

Assessing How Fatigue Causes Mishaps

By Capt. Nick Davenport, MC and Capt. John Lee, MC

Fatigue resulting from sleep deprivation, disrupted circadian rhythm, and/or associated conditions is the most frequently cited aeromedical causal factor in naval-aviation mishaps. Fatigue is four times more likely to contribute to workplace impairment than drugs or alcohol.



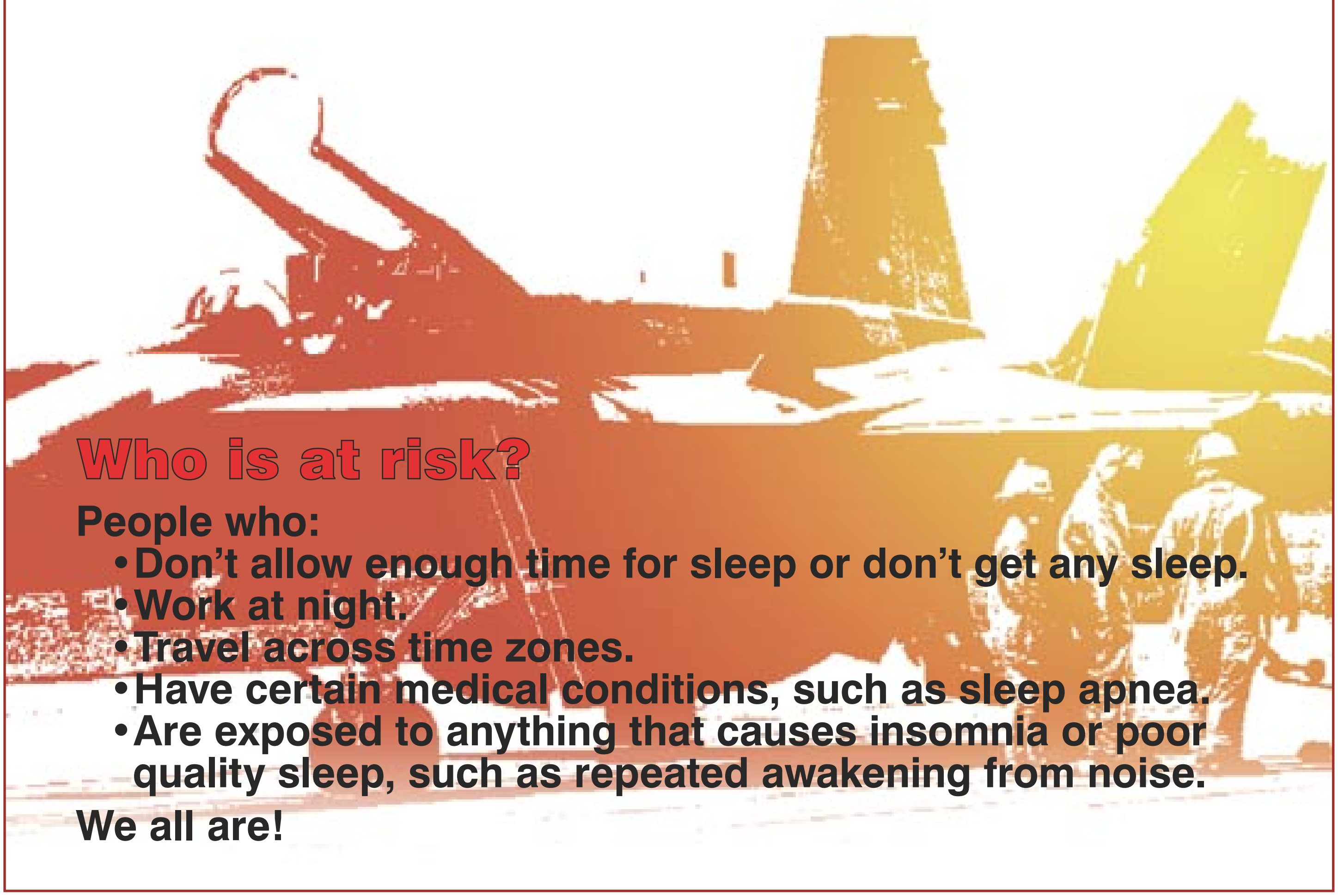
The term "fatigue" describes the constellation of signs and symptoms that result from sleep deprivation and circadian desynchrony. These problems lead to impaired performance and increased susceptibility to such conditions as spatial disorientation, visual illusions, and a variety of conditions that can increase mishap potential. Flight surgeons must look for fatigue as a root causal factor in all naval-aviation mishaps.

Identifying fatigue is difficult, because there are no simple measures. Drugs, alcohol, carbon monoxide, cyanide, and other toxins can be identified from post-mortem tissue and body-fluid testing; however, no similar lab measurement identifies fatigue levels in a deceased aircrew member. Measuring vigilance and cognitive performance in a survivor immediately after a mishap isn't possible or practical. And an aircrew's self-assessment of fatigue has been shown to be poor: The greater the level of fatigue, the poorer the awareness of degraded performance.

Fatigue can be predicted if good information is available on a crew member's sleep habits, timing and quality of sleep, and duty periods before the mishap. Computer modeling of fatigue physiology and prediction of expected aircrew performance at the time of the mishap is feasible.

We now have a software tool that can assist in investigating and monitoring fatigue; it's called the Fatigue Avoidance Scheduling Tool (FAST).

Almost all adults require 8 to 8.25 hours of quality sleep per night at the nightly circadian trough to retain full alertness and cognitive effectiveness. However, in many military operations and training, members get less than optimal sleep; therefore, performance and vigilance suffer. Also, travel across multiple time zones causes shifts of circadian rhythms, which can take from just a few days to more than two weeks for full recovery.



Who is at risk?

People who:

- **Don't allow enough time for sleep or don't get any sleep.**
- **Work at night.**
- **Travel across time zones.**
- **Have certain medical conditions, such as sleep apnea.**
- **Are exposed to anything that causes insomnia or poor quality sleep, such as repeated awakening from noise.**

We all are!

FAST is one such computer program. It accepts information on date and location coordinates, an individual's sleep habits, duty times, sleep time, and sleep quality before a mishap. FAST will project expected cognitive performance, based on these variables. It also will accept the times and locations of all transmeridian travel (waypoints) and will calculate the effects of circadian shifts. FAST has been validated against a variety of test subject data from sleep-deprivation studies and has been shown to have up to 95-to-98-percent predictive ability in certain data sets.

The Naval Safety Center requires flight surgeons to analyze all 72-hour histories obtained in mishap investigations, using the FAST analysis software. In any mishap where aircrew traveled over multiple time zones in the two weeks before a mishap, a full 14-day history is required and should be analyzed in FAST. A 14-day history also should be considered if there are any other factors where circadian shifting would be expected, such as in rotating shift work.

The following fatigue-related information should be collected by the aviation mishap board on all aircrew involved in a mishap:

1. Usual habits of the member regarding sleep. For example, what are the normal times the member goes to sleep and wakes up, both on weekday (or duty-day) and weekend (or off-day) nights? This information helps establish the times of normal circadian variation of each individual and allows some estimation of existing sleep debt.

2. The member's usual sleep quality. For example, how well does he or she usually sleep: excellent, good,

Mishap-Free Milestones

VAQ-130	26 years	42,987.6 hours

> Most people sleep in the dark and are awake in daylight. When that cycle is interrupted by work schedules or the need to travel, the results are fatigue and impaired performance. Our brain requires sleep to recharge and reorganize. You cannot overcome lack of sleep or train to defeat sleep deprivation. It is not a matter of lack of motivation or training. If you don't make up for lost sleep, one way or another, the loss will take its toll.

fair, poor? (Excellent would be considered restful sleep with no nightly awakenings; fair includes up to two arousals per hour; poor is six or more arousals or awakenings per hour).

3. Any evidence for sleep pathology, such as sleep apnea, restless-leg syndrome, narcolepsy, or other medical conditions that may interfere with good quality sleep.

4. Sleep and wake times in the three days before a mishap and estimates as to the quality of each of these sleep periods. This documentation requires a detailed 72-hour history, including a record of times and quality of any nap periods during the day or night.

5. Use of any sleep or performance aids and when. For example, how many caffeinated beverages, sleeping pills, or performance-maintenance drugs were taken?

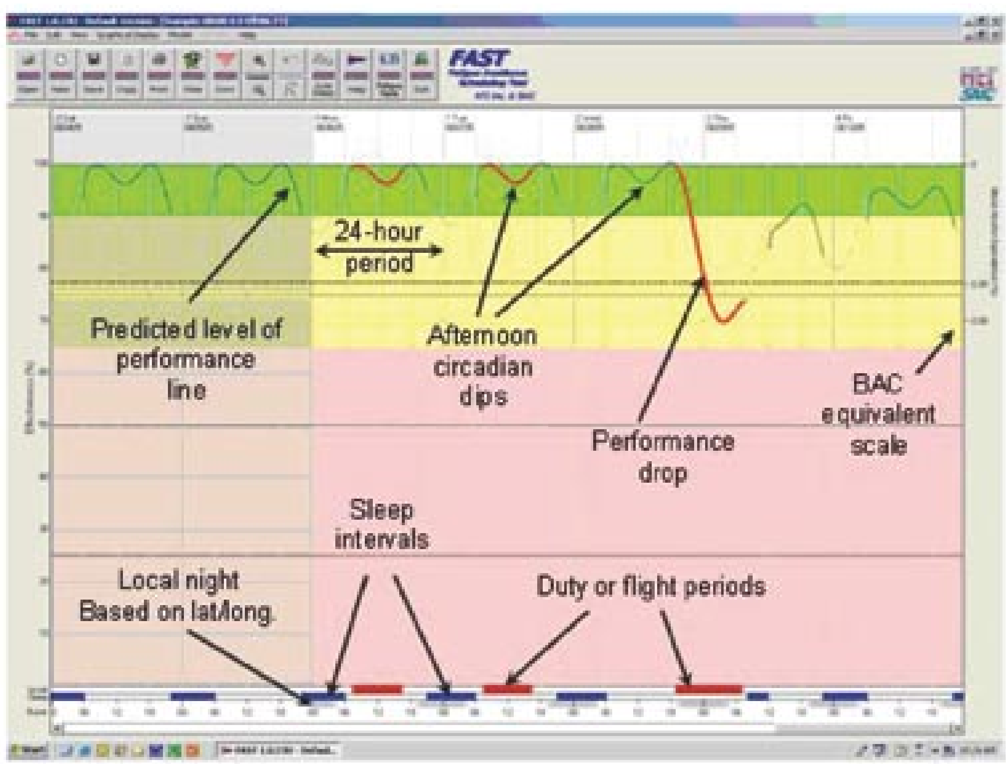
6. Times and location coordinates in latitude and longitude when beginning and ending any travel over time zones.

7. Time and location of the mishap.

The FAST program will accept all the above information (except medication effects) and produce plots of expected levels of cognitive performance, including a numerical assessment of the predicted effectiveness of the mishap member and propensity for lapses or microsleeps at the time of the mishap. Include the FAST plots as enclosures to the aeromedical analysis, and comment as to the likely accuracy or limitations in the data. Recognize that any FAST plots and results, if they are based on 72-hour or 14-day histories, can be obtained from privileged information and also are privileged.

Clearly, the validity of the prediction depends heavily on the accuracy and completeness of the input information, so the best possible attempt should be made to verify times and conditions of sleep in the 72- and 14-day histories. This data collection can be difficult, especially with deceased aircrew members. Try to validate times as much as possible from witness statements, family members, phone records, email transcripts, and any other sources which may help reconstruct the sleep and wake data.

Information on the FAST program can be downloaded from the Nova Scientific Corporation website at: www.NovaSci.com; just click on the FAST icon. The program must be installed in a legacy computer because it has not gone through NMCI certification. Instructions come with the download on unzipping and installing the



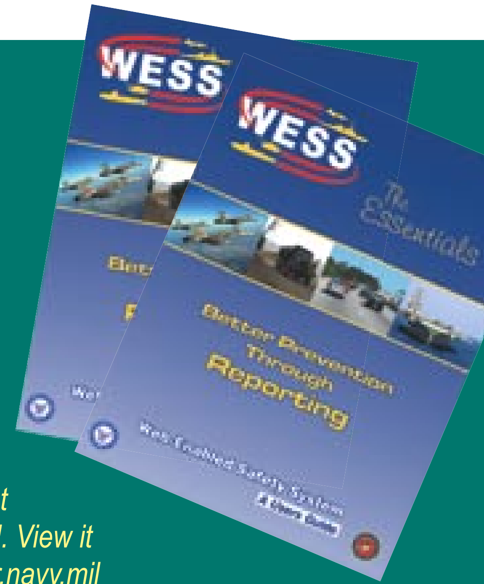
An example of a FAST plot is shown above.

program on a computer on which you have administrative privileges, and on obtaining an activating license. The program is licensed to official DoD users only. Technical assistance in using the FAST program can be obtained by contacting the Aeromedical Division of the Naval Safety Center, (757) 444-3520, ext. 7228 or 7268, or the Command Flight Surgeon at the Naval School of Aviation Safety, at (850) 452-5140. Additional aeromedical information is available on the Naval Safety Center's website at www.safetycenter.navy.mil/aviation/aeromedical.

Capt. Davenport is the command flight surgeon, School of Aviation Safety, Naval Aviation Schools Command, and Capt. Lee is the head, Aeromedical Division, Naval Safety Center.

How do we deal with fatigue?

- ☐ **Recognize we are all at risk, and make sure you get enough sleep, at least six hours (but preferably eight hours) per night.**
- ☐ **Maintain a consistent bedtime and wake-up schedule, even on weekends.**
- ☐ **Exercise on a regular basis, but not within three hours of bedtime.**
- ☐ **Avoid caffeine products within four hours of going to sleep.**
- ☐ **Avoid alcohol within three hours of bedtime.**
- ☐ **Avoid tobacco products within one hour of bedtime.**



A special issue WESS users guide is now available in your squadron. For additional copies contact: April Phillips, Naval Safety Center at april.phillips@navy.mil. View it online at: safetycenter.navy.mil

WESS Update

Training

The Naval Safety Center offers WESS training at your unit that is tailored to your specific needs. The training can range from a one-hour lecture to multiday, hands-on system operation, and includes the latest functions, changes, and improvements to WESS.

Online WESS tutorials can be found at: http://www.safetycenter.navy.mil/wess/tutorial/aviation/

New Items

- WESS search function—This brief will show you how to use the JReport function to find a HAZREP, even if you do not have the date of the event. http://www.safetycenter.navy.mil/wess/tutorial/aviation/WESS_Search_Info.ppt
- Safety authority procedures—Required for all units in order to receive WESS accounts. http://www.safetycenter.navy.mil/wess/tutorial/aviation/Pt8QuesSafetyAuth.ppt

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Hornet Safetygram from the Fighting Swordsmen of VFA-32

When was the last time, during the ORM portion of your admin brief, someone admitted it was a hazard that they were tired? Those words are hardly ever spoken. When was the last time you nodded off while listening to a brief? When was the last time you flew while tired? Maybe we should ask when was the last time you didn't fly tired. The constraints on our time are numerous: ground jobs, SFWT, new tactics, families, significant others and social obligations come to mind. Fatigue can be an everyday occurrence in our lives; there just isn't enough time in the day to accomplish everything we need to do. But how often do we identify fatigue as a serious risk to mission accomplishment? The intent of this safetygram is to raise awareness on the hazard of fatigue.

We are well-trained professionals who would never fly while drunk, but, we all find it acceptable, and perhaps necessary, to fly when fatigued. These situations appear to be completely different, but upon closer examination they are not.

Capt. Nicholas Davenport, MC, USN (FS) from the School of Aviation Safety, conducted an informal review of data from mishaps and hazreps from 1997-2002. His review showed that fatigue was the second highest aeromedical causal factor after spatial disorientation. Alcohol was grouped with medication usage and illness—it was located near the bottom of those causal factors. This would lead us to believe that fatigue is a much more serious risk than alcohol use, but common sense tells us otherwise. As Capt. Davenport points out in his paper "Fatigue in Naval Aviation," aviators correctly observed that this data is skewed, since we know better than to fly while drinking – it's prohibited by NATOPS. If you look at Chapter 8 on rest, sleep and flight time (see page 11), you'll find some suggested guidance on what is ideal, but little in the way of mandated rules. So the denominator for flying while drunk is much smaller than it is for those flying fatigued—we know better! That's why it appears that fatigue is a greater risk—the number exposed to this hazard is much greater.

There have been many studies on the comparison of fatigue and alcohol on psychomotor performance. Collectively, the research shows that alcohol and fatigue produce similar levels of performance degradation. A 1997 study by Australian researchers, as reported in the publication *Nature*, showed that at 21 hours without sleep, the effect on performance was equivalent to someone who had a blood alcohol content (BAC) of .08, legally drunk. While you may view this as an extreme situation, the equivalent BAC of someone who had 18 hours of wakefulness was approximately .06. Recall, 18 hours is the maximum authorized crew day according to OPNAVINST 3710.7T

Now that we know the risks associated with fatigue, we need to address the symptoms that we may see in our squadronmates. Since we have all experienced fatigue, these will look familiar: irritability, mood deterioration, reduced patience, impaired communication, reduced attention, increased tolerance for error and risk, task fixation, reduced motivation, increased reaction times, and nodding off. It is essential to recognize these telltale signs in others because we then have the ability to intervene and prevent a mishap.

In addition, we have a personal responsibility to prevent fatigue in ourselves. By making the proper decisions that allow us to get a restful night's sleep, we can both reduce the potential for mishaps because of fatigue and increase our combat effectiveness.

Fatigue is a hazard that will never go away. I hope this safetygram has raised awareness and fosters discussions in your ready rooms. Your squadron flight surgeons are your best source of information regarding fatigue and will offer more insight and controls to mitigate the risks.—LCdr. Pete Hagge, VFA-32 safety officer.

THE BOOK SAYS...

OPNAVINST 3710.7T

Photo by Matthew J. Thomas.

OPNAVINST 3710.7T
1 MARCH 2004

8.3.2.1 Rest and Sleep

8.3.2.1.1 Flight Crew and Flight Support Personnel. Commanders should make available eight hours for sleep during every 24-hour period. Schedules will be made with due consideration for watch standing, collateral duties, training, and off-duty activities.

8.3.2.1.2 Flight Crew. Ground time between flight operations should be sufficient to allow flight crew to eat and obtain at least 8 hours of uninterrupted rest. Flight crew should not be scheduled for continuous alert and/or flight duty (required awake) in excess of 18 hours. If it becomes necessary to exceed the 18-hour rule, 15 hours of continuous off-duty time shall be provided.

8.3.2.1.3 Circadian Rhythm. Circadian rhythms are cyclic fluctuations of numerous body functions that are set like a "biological clock" to a local time or sleep/awake periods. Changing local sleep/awake periods or rapidly crossing more than three time zones disrupts circadian rhythms and can cause a marked decrease in performance. This condition, called "jet lag," is compounded by illness, fatigue, or drugs, and is resolved only by accommodation to the new local time or sleep/awake period. The accommodation period can be estimated by allowing 1 day for every hour in excess of 3. Accommodation begins when a new daily routine is established. During that period, aircrew are not grounded but can be expected to perform at a less than optimal level. Closer observation by the flight surgeon during the period may be desirable.

8.3.2.2 Flight Time. Precise delineation of flight time limitations is impractical in view of the varied conditions encountered in flight operations. Required preflight/postflight crew duty time must be given due consideration. The following guidelines are provided to assist commanding officers:

a. Daily flight time should not normally exceed three flights or 6-1/2 total hours flight time for flight personnel of single-piloted aircraft. Individual flight time for flight personnel of other aircraft should not normally exceed 12 hours. The limitations assume an average requirement of 4 hours ground time for briefing and debriefing.

b. Weekly maximum flight time for flight personnel of single-piloted aircraft should not normally exceed 30 hours. Total individual flight time for flight personnel of other aircraft should not exceed 50 hours. When practicable, flight personnel should not be assigned flight duties on more than 6 consecutive days.

c. Accumulated individual flight time should not exceed the number of hours indicated in Figure 8-4.

PERIOD (DAYS)	SINGLE PILOTED AIRCRAFT	MULTI-PILOTED (PRESSURIZED) EJECTION SEAT AIRCRAFT	MULTI-PILOTED NON-PRESSURIZED AIRCRAFT	MULTI-PILOTED PRESSURIZED AIRCRAFT
1	6.5	12	12	12
7	30	50	50	50
30	65	80	100	120
90	165	200	265	320
365	595	720	960	1120

Figure 8-4. Maximum Recommended Flight Time

d. When the tempo of operations requires individual flight time in excess of the guidelines in Figure 8-4 or paragraphs 8.3.2.2.a and 8.3.2.2.b, flight personnel shall be closely monitored and specifically cleared by the commanding officer on the advice of the flight surgeon. Aviation-capable ships that do not have access to flight surgeons for waiving flight time limitations should utilize available general medical officers for medical evaluation. Comments should be made with regard to stress level and adequacy of rest and nutrition. Authorization from the squadron commanding officer and flight surgeon can then be made via message. Commanding officers should assure equitable distribution of flight time commitments among assigned flight personnel, commensurate with additional ground duties that each may be assigned.

Note

Flight operations involving contour, nap of the earth, chemical defense gear, night and night vision devices, and adverse environmental factors (dust, cloud cover, precipitation, etc.) are inherently more stressful and demanding than flying day VFR. The resultant fatigue may have a profound physiological effect upon mission capability. Mission planners should take this physiological threat into account in making modifications to normal crew rest/crew day guidelines.

Crew Rest for Reserve Aircrew

By Lt. Pete Zubof

Reserve aviators, historically chastised as "weekend warriors," increasingly have become active and essential assets in our modern Navy. In the past, they had their own units and deployed on their own schedules. More and more, however, these reservists are being asked to fully integrate with active-duty squadrons: flying, training and deploying alongside their active-duty peers.

These reserve aviators, who have served in active-duty squadrons earlier in their careers, are able to maintain currency in their aircraft equal to their active-duty brethren, while only serving in a part-time status. The host of experiences these aircrew bring to the fight also comes with a unique set of challenges in managing their safe operation of naval aircraft.

Many of these aircrew work in high-profile jobs in the corporate sector that can demand as much as 60-plus hours a week. Finding time to balance career, family and the Navy can be a personal challenge for many reserve aviators.

Of particular concern to reserve commands is managing crew rest for their selected reserve aviators. OPNAVINST 3710.7T states that commanding officers should make eight hours of sleep available to their aircrew each day, and the flight schedule should be made in "consideration for watch standing, collateral duties, training, and off-duty activities." Aircrew are not supposed to exceed an 18-hour crew day (most squadrons try to observe the 12-hour crew day of the Air Force as an extra safety measure). These restrictions are all well and good for an active-duty squadron, where the command can closely monitor the working hours and habits of its aircrew. With a reserve aviator, though, how does one judge crew day at all?

> “OPNAVINST 3710.7T states that commanding officers should make eight hours of sleep available to their aircrew each day”

In most active-duty squadrons, working hours for aircrew usually are from 0730 to 1630, plus or minus an hour. If they are scheduled on the night page, most aircrew will sleep in and arrive at work so their total time at the squadron will not exceed 12 hours. Reserve aviators, by comparison, have two bosses to answer to, and their civilian jobs often don’t accept “crew rest” as a reason for not showing up for the 0730 board meeting.

Most reservists also do not have the luxury of taking an entire day off from work to fly at their squadrons; therefore, the majority of their flight time is earned in the evenings after they finish with their civilian jobs. The problem then becomes clear: How does one monitor or control crew day for these overlapping priorities?

There are no clear answers to this question. It is not realistic to monitor the civilian work schedule of a reserve aviator. Neither can we forbid a reservist from flying at night because we know the early and demanding hours of his civilian job, lest we have no reserve component at all. The active-duty and full-time-support aviators in a reserve squadron need to monitor the well-being of their squadronmates and make sure only those aircrew who are prepared to fly set foot in the cockpit.

How do we make sure we continue to operate safely? One key is attention to detail in the brief and preflight process. The difference between a good brief and a bad one often comes down not to the tactical aspects, but to the care taken in approaching the safety and ORM aspects of the flight. For a strike-training flight, a bad tactical plan might lead to the imaginary enemy “winning” the scenario, but failure to address the ORM issues of a tired aviator might lead to catastrophic consequences.

If excessive civilian-job commitments compromise their ability to fly a particular event, reservists need to down themselves until they can resume their military duties. They need to work with their commands to make sure they are afforded training opportunities conducive to the schedules of the squadron and individual.

Active-duty aircrew in a reserve squadron also should challenge their reserve aviators before they go flying and help them provide an honest assessment of their flight status. Such a challenge can be as simple as a friendly conversation. We know the men and women we work with. Are they agitated about something from their civilian jobs? Do they look more tired than usual? These are the intangibles that often can be examined to offset the lack of traditional crew-day monitoring.

Instructions such as OPNAVINST 3710.10T are written as general guidelines on how to safely conduct the business of flying. On the topic of crew rest, only two short paragraphs in the 3710.10T even discuss it. Clearly the onus is on the individual reservists and their commands to establish policies that will allow them to safely conduct their flying duties in a part-time status. “Weekend warriors” increasingly are called on to fulfill active-duty obligations. They need to continue finding innovative ways to blend their civilian lives with the needs of the Navy and do it all safely.

Lt. Zubof flies with VAQ-209.

Photo by MCSN James R. Evans. Modified.

IN THAT ORDER

The decision to push through, in the hope of breaking out, turned out to be a bad idea.

By Lt. Brandon Hunter

At the beginning of the NATOPS brief before every flight, the briefer usually says, "In the event of an emergency, the flying pilot will aviate, navigate and communicate, in that order…" or words to that effect. The brief I received that morning was no different.

Our mission was to provide an airborne, under-sea-warfare (USW) asset to the Submarine Commander's Course (SCC), conducted at the Pacific Missile Range Facility (PMRF) off the coast of the Hawaiian island of Kauai. As the name implies, SCC evaluates a prospective commanding officer's ability to tactically employ his submarine against surface, air, and subsurface USW units.

Our SH-60B would complement a surface group of a DDG, an FFG, and a Canadian FF. As a new helicopter second pilot (H2P), I would confront many firsts on this flight. So far in my short career, I never had taken part in an USW exercise, never conducted HAWK-link operations, and had never operated with any other surface and airborne units. For this exercise, HAWK link would provide us a direct link to a ship to transmit real-time electronic and voice data.

The majority of our brief that morning focused on the tactical portion of the flight, which left us with just about five minutes to discuss weather and ORM. The weather forecast was typical for the Hawaiian area: isolated showers in and around the island chain. Because the weather was little cause for concern, we decided to transit from Marine Corps Base Hawaii (MCBH) to PMRF, with VFR flight following from Honolulu Center. As for ORM, we had a considerable amount of experience in the aircraft to make up for my inexperience. I was flying with a seasoned helicopter aircraft commander (HAC) and two AW chiefs (one being the squadron's enlisted Seahawk weapons and tactics instructor) in the cabin. The only hint of potential concern came from the HAC and one of the AWCs, who stated they recently had not been feeling well. However, both stated they were OK and ready to fly.

We departed MCBH and made the one-hour trip to PMRF. During the transit, we played the requisite "stump the H2P," 21-question game. When we arrived at Kauai, we decided first to get fuel to maximize our range time. When our crewmen got out during the hot pump, they saw a popped corner fastener on our tail-rotor-gearbox cowling. We had to shut down after getting fuel to refasten it, per our SOP. Not only did this extra task cost us range time, but we lost our HAWK-link crypto because external power was not available. Because the HAC was not deck-landing qualification (DLQ) current, we could not get a deck hit on a ship and rekey the crypto. We now were forced to do coordinated USW without HAWK link. Instead of having real-time, electronic data link with the ship, we would have to pass all our information via the radio. Nothing on this flight seemed to be going right, and the entire crew was getting frustrated before we even made it to the exercise. We took off and headed to the exercise area, determined to give it our best.

When the event ended two hours later, our tired and frustrated crew headed back to MCBH. We hit the fuel pits at Barking Sands one last time, hoping to make it through unscathed. While the aircraft cooperated, one of the AWCs (the same one who had been under the weather) got sick in the fuel pits. The HAC also started to feel less than stellar. After discussing our situation, our crew decided everyone still was safe to fly, and we started home.

I flew the aircraft to give the HAC a break; he had flown most of the flight thus far. The flight was quiet. We were a tired and weary crew looking forward to getting out of the aircraft. About 15 miles from home, we ran into one of those isolated rain showers we had discussed in our brief. We contacted tower, and they still were calling the field VMC. We elected to continue on course rules, trying to make it through the deteriorating weather, instead of having to get picked up for the lengthy PAR. The visibility continued to drop, and we decided we could go further. Just as we began to turn around to maintain VMC, the "ENG FIRE" light on the master-warning panels illuminated, along with the No. 1 engine T-handle. NATOPS states that sunlight filtered through smoke or haze may activate the fire-detection system, but because of the overcast and rain, this should not have been the cause.

"In the case of an emergency, the flying pilot will aviate, navigate, then communicate…." Well, we forgot all about that. Almost immediately, all eyes up front were on the brilliant red "ENG FIRE" light and the engine instruments. Our two AWCs fixated on the engine cowling, trying to confirm the fire. As a result of our fixation, we flew into the heavy rain we had been trying to avoid. Instead of just having one EP to worry about, we had given ourselves another by going inadvertent IMC.

The crew quickly refocused, and the CRM juices started to flow again. Immediately, the HAC got on the instruments and turned to a safe heading, while the AWCs and I worked on confirming the fire. Because we had no secondary fire indications, we did not pull the fire T-handles or activate either extinguisher bottle. We reported our situation to tower and coordinated a PAR to get us back on deck.

We made an uneventful landing, and as soon as we touched down, the "ENG FIRE" light went out. We taxied back to our line and shut down. The erroneous fire indication was caused by a faulty fire detector.

Valuable CRM lessons were learned from this flight. The decision to push through, in the hope of breaking out, turned out to be a bad idea. We thought we were saving time by pushing through the weather, but because of our poor decision-making, we actually had extended our time in the air. Had we simply decided to fly the PAR from the beginning, we would have been lined up on final when the "ENG FIRE" light came on. Why take the risk and push through when a PAR readily was available?

Had we flown like we briefed, we much sooner would have determined the fire light was a false indication. Instead, our momentary loss of situational awareness forced us to aviate and navigate ourselves out of inadvertent IMC.

Finally, at the end of a challenging mission, with two under-the-weather aircrew and everyone feeling fatigued, we had allowed ourselves to become complacent in anticipation of getting out of the aircraft. What could go wrong five miles from home? When things go wrong, they always will go wrong at the moment that's least convenient. While I began the flight thinking I would learn valuable lessons about real-world USW, I ended the flight learning a much more valuable lesson about the basics: Aviate, navigate, and communicate. Brief the flight, and then fly the brief.

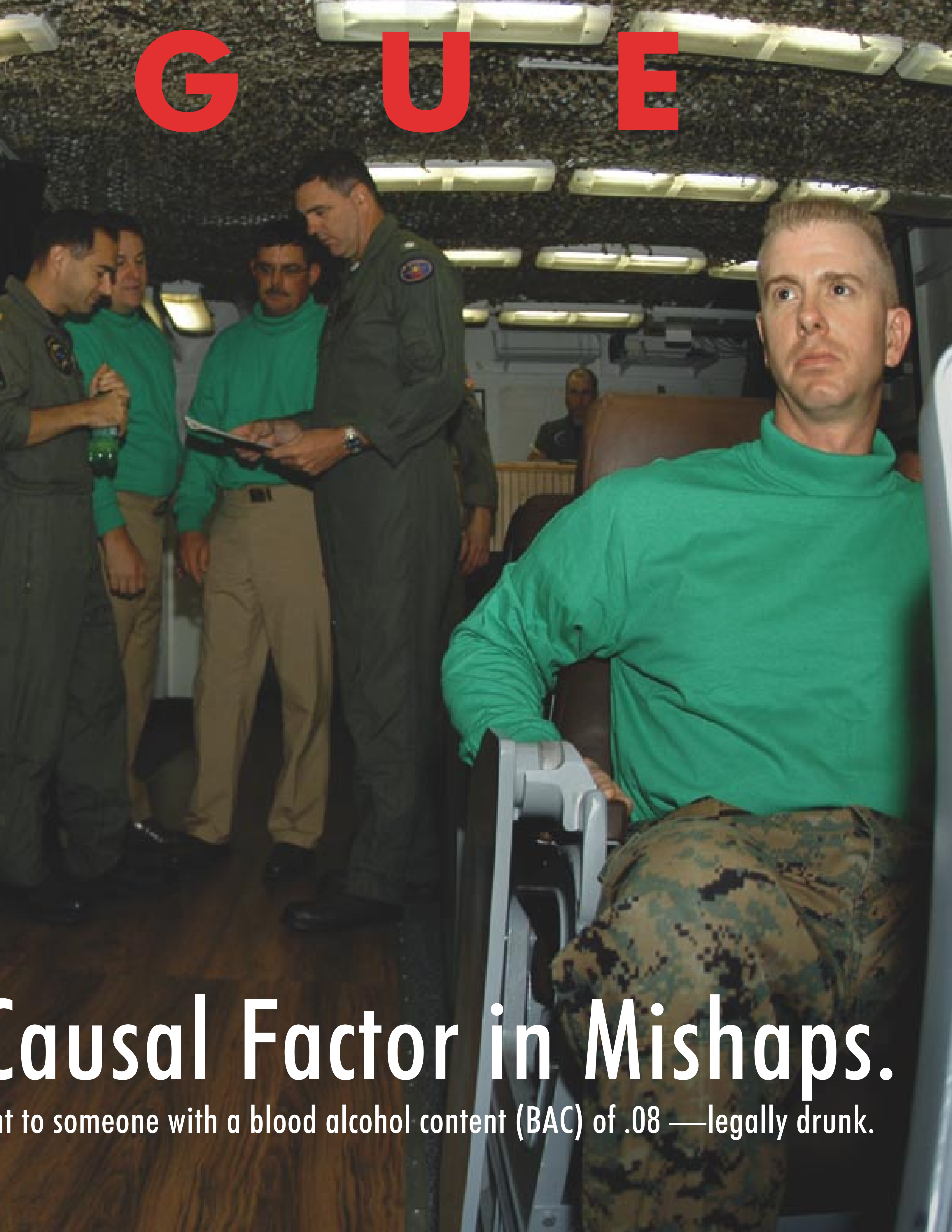
Lt.Hunter flies with HSL-37.

F A T I

The No. 1 Aeromedical C

A tired aviator is an impaired aviator. 21 hours without sleep is equivalen

Photo by MCSN Travis S. Alston



G U E

Causal Factor in Mishaps.

nt to someone with a blood alcohol content (BAC) of .08 —legally drunk.

Calling a Halt

By Lt. Todd Valasco

Our detachment was nearing completion of the carrier strike group's (CSG's) joint-task-force exercise (JTFEX), and eagerly awaiting the chance to get home for some well-deserved holiday leave before our deployment aboard USNS *Rainier* (T-AOE-7). As the December work-up was drawing to a close, we were tasked with one final operational mission on the afternoon before our flyoff the next morning.

At first glance, the tasking appeared to be a routine vertrep (vertical replenishment): take a large number of weapons to the carrier and return an even larger amount of support gear back to *Rainier.* The carrier requested the services of both our MH-60S aircraft. The problem arose when we noticed we had been given only three hours to complete a task that normally takes at least four hours. The carrier wanted to begin the vertrep at 1500 local time and expected us to finish by 1800. On the morning before the actual vertrep, the carrier called to delay the start until 1600. This slide to the right was significant; sunset was at 1645, making the vertrep primarily a night mission now. This evolution no longer was routine; some ORM beyond the typical filling in numbers on the worksheet was required.

The MH-60S NATOPS states, "Night vertrep is an inherently demanding and fatiguing evolution that requires particularly high levels of planning and coordination." Our first concern during planning was the environmental conditions and setup for the vertrep. Both the NWP 4-01.4 unrep (underway replenishment) manual and the MH-60S NATOPS require one or more of the following conditions to be met before conducting night vertrep:

- A natural horizon exists.
- The ships are alongside in the connected replenishment (conrep) position.
- The drop/pickup zone of the receiving/delivering ship is clearly visible from the cockpit when over the drop/pickup zone of the delivery/receiving ship.

The forecast called for clear skies and a full moon for 100-percent illumination. Based on that information, we were confident a natural horizon would be present. We also were confident the natural lighting, combined with the ship's lighting, would keep the drop/pickup zones of both ships visible at all times. Thus, two of the three criteria for night vertrep would be met. The ships would not be in the conrep position but alongside at about 400 yards (within the 300-to-500-yard range the NWP 4-01.4 recommends for night vertrep).

Our second consideration in the planning phase was fulfilling the carrier's request for two aircraft. While two aircraft in the vertrep pattern during the day is commonplace, some informal research with our home squadron revealed this practically was unheard of at night. The increased risk of having to clear ourselves from an additional aircraft in the pattern was obvious: Maybe there was a good reason no one at our squadron, whose primary mission is vertrep, had done a two-aircraft night vertrep. Perhaps the risk really was too great. However, with the number of lifts to complete in fewer than three hours, it would be impossible to complete the mission with only one aircraft. The environmental conditions were good enough to mitigate some of the increased risk. By implementing additional controls, we felt we safely could

Please send your ORM questions, comments or recommendations to: Cdr. Allen McCoy, Code 16
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Photo by JO1 Paul G. Scherman. Modified.

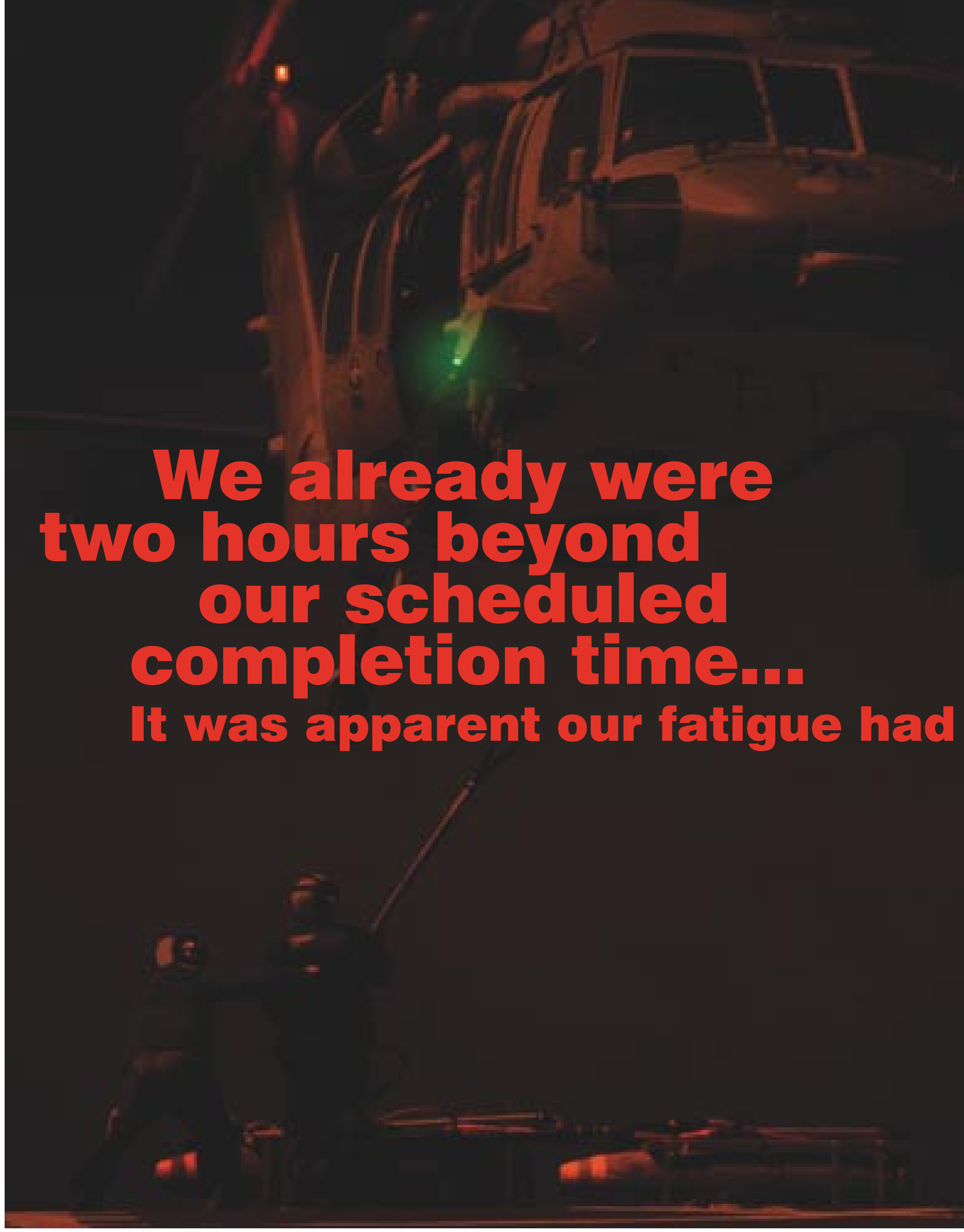
accomplish the mission with two aircraft.

Both aircraft launched off *Rainier.* My aircraft, first to launch, got airborne at 1500, an hour before the expected vertrep start. The second aircraft lifted 40 minutes later. We began burning circles in the sky, waiting for the carrier to get into position and to give us a green deck to commence. The plan then began getting off track. It soon became clear the carrier would not be ready to start on time; we still were waiting an hour later.

About 10 minutes before sunset, the last fixed-wing aircraft launched. At that point, we already had been flying for more than an hour and a half, and we hadn't yet started the sizable vertrep ahead of us. With only about half an hour of fuel remaining, we decided to refuel. What little light remained quickly was gone. Our hopes for getting the pattern set and getting in the groove for vertrep in good light had evaporated with the setting sun. Finally, after we refueled, the carrier granted us a green deck to start the evolution.

The first of many controls we implemented with two aircraft in the pattern at night was to deliberately set a wider, longer pattern than for day vertreps. We wanted to increase separation between aircraft. Also, both aircraft placed their position lights on bright and turned the formation lights on high to increase our ability to see each other throughout the pattern. The full moon and lighting from both ships made it possible to have an entirely visual pattern for the vertrep. In our aircraft, we briefed that any time we had to wave off for a fouled deck or any other reason, we immediately would engage the altitude hold, and the pilot at the controls would transition to an instrument scan. This procedure was essential, as a waveoff call would entail allotted time. Starting an hour late, extending the pattern, and spending more time over the deck to pick up and drop loads at night were just too many factors to overcome. To push faster would require taking risks: a tighter pattern, less clearance between aircraft, and shorter hook-up and drop times. We were unwilling to compromise the safety of the aircrews by removing the controls we had put in place.

By now we began to consider the limits of our endurance. We already had been flying for nearly two hours before the vertrep even started. We were nearly two hours into the vertrep, and the end was nowhere in sight. NWP 4-01.4 lists a number of factors that can affect pilot fatigue during any vertep operation. It states that during night vertrep, the effective limit for pilot endurance may be reduced to as little as two to three hours.



One of the primary factors affecting aircrew endurance is experience. Beyond the requirements to maintain currency, we virtually had none. I had been in the squadron a little more than three months, and this was only my second operational vertrep of any kind, the first at night. It also was the first operational night vertrep for the HAC in my aircraft. In the other aircraft, the HAC had some limited night-vertrep experience, but the copilot nearly was as new in the squadron as I was, and it was his first operational night vertrep, as well. The naval aircrewmen, who are essential for effective vertrep operations, were inexperienced with night vertrep. The primary result of all this inexperience was an increased fatigue rate that we all recognized.

During one of our many turns in the delta pattern, while the carrier cleared loads and spotted new ones, we discussed fatigue as a crew. We again used ORM to implement controls. If any member of the crew became fatigued to the point he felt he no longer could safely accomplish the mission, he should speak up, and we would knock it off, no questions asked. The HAC also made a radio call to both ships, stating the two-to-three-hour limit for pilot endurance as stated in the manual and suggested it might not be wise to push the vertrep much longer.

Two hours later, after a total of four hours of night vertrep and only retro loads remaining, the ship's master called a halt to the evolution. We already were two hours beyond our scheduled completion time. We would get the remainder of our retro during our next unrep with the carrier, a few days into our deployment. Had the master not made this call, we surely would have made the same call a few minutes later. It was apparent our fatigue had affected our ability to effectively conduct the mission. We had discussed calling a stop within the next few minutes. For everyone involved, the decision to stop when we did was the correct one. The other aircraft recovered first; we recovered 45 minutes later, having flown for more than seven hours. By any measure, it had been a long night.

We had moved more than 330 tons of cargo in an extremely fatiguing and demanding environment. We felt entirely justified in calling the mission a complete success. Before and during the mission, we used ORM heavily. Preflight emphasis on the weather and illumination forecast and discussions of the additional risks of two aircraft in the night-vertrep pattern helped us implement controls and increase the safety margin. During the flight, the agreement between the two HACs to leave the position lights on bright and to turn on the formation lights to maximum, to aid in clearing each other, was an example of implementing controls. ORM was an ongoing process throughout the mission.

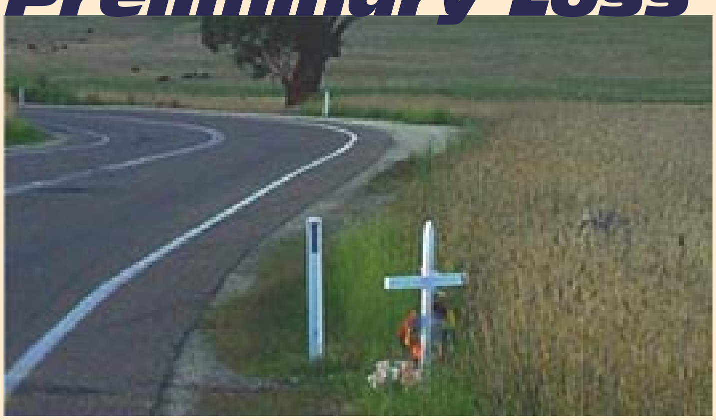
The statement in the MH-60S NATOPS about night vertreps should be taken quite literally, especially when more than one aircraft is involved. By specifically identifying and assessing the additional hazards associated with night vertrep, NATOPS already had completed a critical part of the ORM process.

In nearly ideal conditions, we were able to vertrep for four hours at night, but then our performance began to degrade. Operational planners should ignore the vague language in the publication and stick to a hard rule of planning less than three hours for night vertrep. By doing so, planners can mitigate the increased risk of fatigue associated with night vertrep and enable the MH-60S community the best opportunity to provide safe, efficient logistics service to the fleet.

Lt. Valasco flies with HSC-21 Det. 9.

affected our ability to effectively conduct the mission.

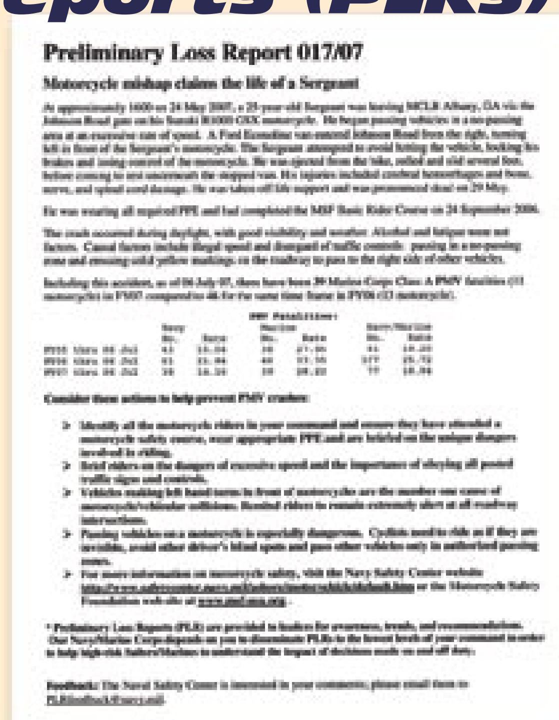
Preliminary Loss Reports (PLRs)



The Naval Safety Center has begun issuing one-page Preliminary Loss Reports (PLRs) for all off-duty and traffic fatalities. The goal is to increase awareness of these costly (and preventable) mishaps and to help high-risk Sailors/Marines to understand the impact of decisions made on- and off-duty.

Each PLR contains a brief narrative about the mishaps, updated trends comparing Navy, Marine and combined rates for the past three years, and a series of suggested actions to help avoid similar mishaps.

If you'd like to automatically receive these PLRs, email our public affairs officer at safe-pao@navy.mil.



Preliminary Loss Report 017/07

Motorcycle mishap claims the life of a Sergeant

Bingo + Bad Weather + Gear Problems = No Fun

By Lt. Sean Michaels

The EA-6B carrier-qualification (CQ) detachment was going well, and it was the last night to finish training for our Cat. I pilots. As an ECMO CQ instructor, I was accustomed to completing our CQ requirements late on the last night of the det.

My pilot, a Marine, needed four traps and a touch-and-go to qualify. We were scheduled to hot-switch into a jet whose pilot also needed four traps and a touch-and-go. It was the beginning of summer, and the first night launch was not until 2130. We expected a very long night, but I never imagined how long or painful the flight would be.

The crew consisted of the Marine pilot, a student ECMO in the backseat, and me. Our day had started at noon when we briefed and flew an uneventful, hour-long flight to complete our daytime trap requirement. We completed debriefing around 1630, then the pilot and I took hour-long naps. We briefed the night flight at 1930, then sat in the ready room and waited for the jet. At 2200, the jet we were waiting for was in the Case III pattern for its last trap, so we walked to flight-deck control. To our dismay, the jet was bingo-on-the-ball, and after boltering, the crew headed to NAS North Island, about 80 miles away.

Being a Prowler naval flight officer, I neither was surprised nor agitated that the jet I was about to climb into was now on an emergency-fuel profile to the beach and would be back in no sooner than an hour and a half. We would play with the hand dealt to us. We went back to the ready room and waited for our jet to refuel at the beach and fly back.

At 2345, we made the trek back to flight-deck control. Our jet trapped just before midnight and was parked in front of the tower on the foul line. We walked onto the flight deck at midnight. The crew, however, was not allowed to open their canopies because of the jet's location next to the foul line. They had to wait for a lull in the sequence of landing aircraft, which finally came at 0015. Unfortunately, we couldn't get in the jet, because our maintainers were working on the left engine. I finally climbed into the jet at 0030, and my pilot joined me 30 minutes later; he had been standing on the foul line waiting for the past hour.

It now was 0100, and our maintainers still were doing some final checks on our left motor, which was shut down. We eventually got the left engine started and taxied to the cat at 0125. For those of you not familiar with CQ, taxiing to the cat at that time of night, with four traps and a touch-and-go remaining, is not a good position to be in. If you get those requirements knocked out in two hours, you are doing very well.

At 0130, we were shot off catapult 1; one of our fellow Cat I pilots had taken off just before us. The "Prowler Ball Show" now was underway, as we were the only two jets airborne. Our first pass was a touch-and-go, and my pilot had a nice pass. On the next two passes, we trapped and sat on the cat with just less than 7,000 pounds of gas. After the bad hand that had been dealt to us, we were doing the very best we could, and I thought we might even qual on one bag of gas.

We boltered on the next pass though, so Paddles told us to go hook up. We were getting low on fuel. Paddles said they would count the next touch-and-go as a trap, saving us the fuel required to take another cat shot. "Great decision," I thought—one that would allow us to complete the event on one bag of gas.

However, fatigue had begun to set in, and we were waved off on our next pass. We finally completed a touch-and-go, and the next trap would be for a final qual. After getting a 4.5-mile hook to final bearing, we dirtied-up and completed our landing checks. Five miles behind the ship, our gas was 3,400 pounds; we were going to be bingo-on-the-ball.

Out the corner of my eye, I saw a red flashing light. I turned to look, and to my horror, I saw we had a flashing wheels-warning light, indicating all three landing gear were not down and locked. Having no time to look at a checklist, I called Paddles and told them we had three good gear indications on our position indicator, but all secondary indications were negative. I called the ball with 3,200 pounds of gas, and I could hear the disgust in our LSO's voice as he said, "Wave off. Wave off. Your lower anti-collision light is on, and you have no approach light. Wave off!"

We were well below dirty bingo, so I told the pilot to raise the gear. I gave him a steer toward North Island, 70 miles away. I asked my back-seater to check the 70-mile bingo numbers for me and to let me know what he came up with. This being my fourth Cat. 1 CQ det, I was very familiar with the numbers and knew the approximate profile—I just wanted some backup. I also had a gear problem to contend with. During our bingo-climb profile, I asked the back-seater for the bingo numbers, and he asked me what altitude we would be going to. Altitude was a key piece of information I needed backup on. I told the back-seater to forget it and to tune in to North Island ATIS (automatic terminal information service). I had no time to explain what I needed; it was easier for me to get the information myself.

After some terse comms with ATC and the approach controllers, we were vectored for the PAR to North Island. What I did not know was we absolutely would need the precision approach, because ceilings significantly had dropped in the past hour. During the climb, I looked at the fuel gauge, and it read 1,900 pounds. After looking at our distance to the field, I instructed the pilot to immediately begin the descent. I told SoCal approach we would require a trap and verified the arresting gear was rigged on the runway we were being vectored to. Passing through 5,000 feet, we still could not see North Island. All we saw was a faint orange glow through a thick marine layer; this approach was going to be sporty.

Inside 10 miles, we put down the gear and flaps, and as expected, the wheels warning light flashed like a taunting strobe light. One of our gear may not have been down and locked, but we had no idea which one. At 500 feet, we finally broke out, and I told the pilot to blow the gear. I felt the comforting thuds of our nitrogen-driven gear-blow-down system, but all of our secondary down-and-locked indications still were negative. We would have to land on centerline, catch the arresting wire, and hope for the best. Fortunately, all the gear stayed down and locked, and we took a trap with 1,800 pounds of gas remaining. I looked at my watch; it was 0330.

That next morning, I thought about the previous day's events, examined our actions, and thought about how we could have handled the situation differently. The first question that came to mind was: Did I risk three people's lives because I felt pressure to qualify my pilot on the last night of CQ? I had relied on my pilot's honesty when I asked him if he felt rested enough to fly. It had been a long day, and he had said he felt good.

Given those circumstances again, I would choose to fly. However, I could have done something to improve our performance while handling the fuel and landing-gear emergencies. Crew coordination could have been much better during the bingo-profile, which I attribute to the fact it was only the back-seater's sixth flight in the Prowler. I should have gone over the information in the brief I would need if we had to fly a bingo profile. That improved coordination greatly would have lowered the stress level in the cockpit and allowed me to more thoroughly examine our landing-gear problem. The next time I'm at the boat, I won't take crew coordination and responsibilities for granted.

Lt. Michaels flies with VAQ-133.

The Tailhook That Couldn't

Joining up on the tanker through scattered layers was the least of

By Lt. Charles Schwarze

Any pilot who's flown in support of Operation Enduring Freedom (OEF) in the winter months knows weather in Afghanistan can be frustrating, routine tasks can turn treacherous, and fuel ladders can change by the minute. Then, five hours after takeoff, when you're over the Arabian Sea, the most dangerous and difficult part of the mission is about to occur: landing back on the boat.

Four months into a routine eight-month deployment, our air wing had started round three of OEF, after some changes of scenery to include Iraq, the Horn of Africa, and a holiday port call in Dubai. I was lead for a section of Rhinos going north to support new JTACs (joint terminal attack controllers) in-country; my skipper was flying wing. Going into the brief, I knew the weather over Afghanistan was terrible, and our brief confirmed that fact. You could expect tankers to look for clear air and jets to experience icing conditions on the transit.

I focused on the basics during the brief, which included safe tanker join-up and tac-admin specifics, anchoring on JDAM (joint direct attack munition), in case we had to employ them through the weather. We allowed time to load mission cards and to get the body ready for the six-hour mission. I walked, confident I could get my jet to Afghanistan, back to the boat, and safely aboard at night. After all, we'd been doing this for four months. What could go wrong?

The launch and transit north were uneventful and long, as usual. We joined our first tanker an hour before sunset, with some minor theatrics, in the weather at 27,000 feet, and about 50 miles north of Kandahar. It was good to see a KC-10. My skipper and I each took 13,000 pounds of gas. The weather continued to deteriorate as we fueled. Most of the tanker tracks were becoming unworkable because of poor weather, and sunset was approaching. My skipper made the call to send our air-wing assets back to the ship,.

Knowing our next two scheduled tankers were KC-135s, I didn't say a word as I pointed the flight back south

toward the boat. We had enough gas to make the scheduled recovery and even had some extra help as a KC-135 stood by for us as we departed Pakistan for the North Arabian Sea. We took a few thousand pounds extra and entered the marshal stack.

For those of you who haven't given up on this flight (and article) getting interesting, here we go. I pushed out of marshal with no issues and started the CV-1 approach to the ship. My first pass had that familiar cadence as Paddles gave their infamous, "Little right for lineup… easy with it… bolter… bolter… bolter!"

I cursed under my breath, raised my landing gear, and turned left for another try. I told Paddles I'd be tank state plus two passes on my next landing attempt. I rode the ACLS down and flew a solid pass on my second attempt but again found myself flying. This time, it took Paddles a few seconds before coming on the radio with a "hook skip" call to ease my pain. I could hear uncertainty in his voice, which made me a bit uneasy about what just had taken place.

I turned downwind, this time picturing my squadronmates in the ready room "rigging for red" and taking bets on whether I'd complete the over-under by tagging the ace the next time down. The Air Boss broke up my thoughts during the crosswind turn by saying, "103, check your hook down."

I wanted to retort with, "No sir, I was just getting a few touch-and-goes," but restrained myself. I instead told him the hook handle indeed was down, with no transition light.

my concerns; all I could think about was how I would land my jet.

He followed with, "Roger that 103, we didn't see any sparks on that last bolter." My mind started racing.

Like any other carrier aviator, one of my favorite things to do at night is watch "scary TV," better known as the ship's plat camera, and make fun of pilots boltering at night by yelling ironic quips to the TV, like "See ya later, sparky" or "I guess he just wanted to get more flight time."

Photo by MCSN Travis S. Alston. Modified.

We also know how horrible it is to be the guy who drags his hook past those wires and has to fly another night approach. Unfortunately, my hook didn't spark that second time, and I had no idea why not. Was it broken? Was it not fully extending? I didn't know the answers, and I had no way of knowing because I couldn't take a look at it.

My next problem after that second bolter was gas. I determined I'd be tank plus a few hundred pounds after my next attempt. I could see my tanker take a hawk position at my right 5 o'clock as I started down on glideslope for the third time. Everything looked good as I rolled on the flight deck for what seemed like an eternity. Then I heard a "power back on" call. I was going flying yet again; my heart sunk. I cleaned up the jet and took a radar lock on the tanker at my 1 o'clock.

Joining up on the tanker through scattered layers was the least of my concerns; all I could think about was how I would land my jet. I knew Seeb International airport in Oman was roughly 200 miles away, and I had a sneaking suspicion no matter how well I flew any subsequent passes at the boat, something on my jet wasn't going to allow me to catch any of those wires.

I tried to do the mental math and got the call to switch to my squadron rep on button 18. I got settled in the basket and shut up departure by calling "plugged and receiving."

My rep advised me to take 6,000 pounds, and I happily obeyed. I asked what they could see of my jet during the bolters. He said I may have hit something on the flight deck after my first bolter, and my hook looked like it wasn't fully extended on tries two and three. With that information and 9,000 pounds of gas to play with, my signal was divert. I was ready for a cold one.

I still had 2,000 pounds of ordnance on the jet, and my new wingman, the tanker, focused his FLIR on my jet to get some good cruise-video footage of my slicking off the jet. This also exposed my hook problem, which, at the time, I'm glad I had not known about. My hook was down but had rotated 60 degrees to the starboard side of the jet. We found out later that the turtleback (a metal shroud used to cover the catapult blade at the end of cat 3) had met with my hook at the end of my first bolter. The hook slammed into it and went up to the right, breaking the centering spring that holds the hook straight on the centerline of the aircraft. Each time I had cycled the hook, it had slammed into the lower starboard fuselage panel, leaving three separate holes in the fuselage. If a divert wasn't available, there would be no way to stop the jet, other than a barricade.

I arrived at the bomb box, jettisoned my bombs, kissed off my wingman, and started a climb toward Seeb International. I was told to stay below FL230 en route to Oman and complied, knowing I'd be fat on gas. I climbed, set max range, and broke out my navbag to check out the approach plates for Seeb. Although our aircraft doesn't have the navigation suite to shoot the published approaches there, the SA gained by looking at the approaches and the airport diagram would be invaluable. Flipping through the pages, I found Santa Maria and Sevilla. Spain? That didn't sound right. I looked at the front of the approach plate and saw I had a European Volume Five, which would have been helpful in a divert to Egypt or the Azores. Unfortunately, I required a Volume Seven for Oman. Thankfully, I had an IFR supplement, a good waypoint for the airfield, good weather, and a controller I could understand.

I retracted the hook, checked my anti-skid and taxi light on, and landed on asphalt for the first time in five months. I taxied my hurt bird to the Royal Air Force detachment and hopped out to inspect the damage. I had three punctures to the skin of the aircraft and major damage to the hook-attachment point. I was grateful to the Brits, who were waiting with a cold one. The next day, our HS squadron brought out a four-man rescue detachment. After some quick work with speed tape and a new tailhook assembly, we were headed back to the ship.

The entire experience ended well but raised some major debriefing points. What if the weather in Seeb had been 200-1/2 when I got there? Air operations probably would have sent me to a field with a TACAN approach, but again, I didn't have the appropriate plates. Make sure you have the materials for the theater you're operating in, and you'll be covered for any contingency. I knew full well how to get to the diverts in OEF and had the plates to get into Kandahar or Bagram, but those sites were 600 miles away when my emergency happened.

Fortunately, not all the holes in the Swiss cheese decided to align that night, and we didn't have to barricade the first Rhino. Not every emergency we have is a NATOPS quiz, but the unexpected can and will happen. If you have solid preparation, the right information, and a solid team to work with, you can get through almost anything.

Lt. Schwarze flies with VFA-143.

HMM-262

From left to right, helicopter aircraft commander, Maj. Daren “Bones” Brown; copilot, BrigGen. Timothy “B.T.” Hanifen; crew chiefs, Sgt. Jesse Morgan and Cpl. Michael Scheddel. Photo by Cpl. Andrew Kalwitz of the Al Taqaddum, Iraq Public Affairs Office.

The Flying Tigers of Marine Medium Helicopter Squadron 262 were tasked to fly troops and equipment between various forward-operating bases and combat outposts throughout the Al Anbar province of Iraq. While the Operation Iraqi Freedom mission was routine, the flight quickly proved otherwise.

That night, one of the two generators that provide electrical power to the CH-46E Sea Knight helicopter caught fire. The fire led to a complete electrical failure and prompted an emergency landing in the desert. The crew included crew chiefs Sgt. Jesse Morgan and Cpl. Michael Scheddel; the aircraft commander, Maj. Daren “Bones” Brown; and his copilot, BrigGen. Timothy “B.T.” Hanifen (visiting commanding general).

Shortly after takeoff, the general smelled something burning. Sgt. Morgan saw sparks coming from the back of the helo and immediately directed the pilots to turn back toward the airfield. The sparks grew to a large blaze, engulfing the rear portion of the cabin, so Sgt. Morgan called for the pilots to land immediately. With one of the two onboard fire extinguishers, Sgt. Morgan rushed to fight the fire. He completely discharged the first fire extinguisher in three to four seconds, putting out only the lower flames, but a fire still was burning higher near the aft transmission. As the pilots maneuvered the helo, looking for a safe place to land, Sgt. Morgan grabbed the remaining fire extinguisher and continued to battle the flames. He quickly emptied the second fire extinguisher. While Sgt. Morgan fought the fire, Cpl. Scheddel had the pilots secure the generators and located a road in the open desert suitable for an immediate emergency landing.

After Maj. Brown landed the burning aircraft on the road, Cpl. Scheddel evacuated the passengers. Sgt. Morgan grabbed his M16-A2 rifle, ran outside, and used his flashlight to signal the lead aircraft circling above to land. When the lead aircraft touched down nearby, Sgt. Morgan sprinted to the helo, grabbed another fire extinguisher, and hurried back to the burning aircraft to snuff the remaining flames. Once the fire was out, Cpl. Scheddel and Sgt. Morgan climbed back into the helicopter to man their .50 caliber machine guns and prepared to repel any enemy insurgents who might threaten the downed aircraft and crew. The crew chiefs manned their weapons until a quick-reaction force arrived on scene to provide security. A maintenance crew flew to the site and made sufficient repairs to recover the aircraft later that night.

For their actions, Sgt. Morgan and Cpl. Scheddel were awarded Navy and Marine Corps Achievement Medals and were recognized as safety professionals of the quarter.

Bravo Zulu

Identifying potential mishaps before they occur is key to a successful safety program. The Hazard Reporting (hazrep) Program is an information-sharing process that the Naval Safety Center, Commander Naval Air Forces, Naval Air Systems Command, and Chief of Naval Air Training use to identify and mitigate risk factors. Hazard information that is shared among communities also serves as an ideal training tool to reduce mishaps. The following aviation activities are recognized for their robust Hazard Reporting Program with five or more hazreps submitted during the second quarter of FY07:

HMM-261 VT-3 HMM-364 VT-7 VP-1 VT-31 VQ-1 VT-35 VQ-2

Decision Making
Assertiveness
Mission Analysis
Communication
Leadership
Adaptability/Flexibility
Situational Awareness

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A Sobering Piece Of Irony

By LCdr. Anthony Staffieri

Just when I thought the pocket rocket never could do me wrong, it did. Actually, it really wasn't just the PCL's fault but a combination of all those things we try to avoid or don't think can happen to us. I'll set the scene in a moment, but let me start by providing a little career background.

After my first VS tour, I headed over to P'cola for NFO instructor duty. It was a good tour that allowed me to hit all the wickets: head NFO flight scheduler, IUT instructor, and finally the standardization and NATOPS officer. I even got chosen as instructor of the year. I then spent more than two years with Commander Second Fleet in Norfolk. Talk about leaving aviation altogether, this place would make you forget you had a home. It was swarming with SWO daddies and demanded long hours, but the tour was incredibly eye-opening as to how the real Navy works. Other than the gold wings on my khakis, the fact I was a brownshoe quickly faded to the back of my mind.

I finished that tour with some polished turboprep skills, and then I was off to the wing for "temporary duty." I stayed there for a year and a half and didn't start FRS training until one year into the tour. I then spent three months post-FRS at the wing, going from one back-in-the-saddle (BIS) to another. I was more than three and a half years out of the cockpit. Combine those three years of not flying with multiple BIS hops, and it's easy to overestimate anyone's currency and proficiency.

Flash forward to my current tour. Because my squadron essentially was in limbo until decommissioning, no work-ups or high-tempo ops were headed our way. That meant after being in the squadron for about two weeks, I had flown maybe three times, none at night. My first night flight (form-tanking mission) was with a nugget pilot. The flight came and went uneventfully—well, kind of. When I say "kind of," I mean up until we lowered the gear in the overhead on our final landing of the night. We had an unsafe nosewheel indication.

Let me mention the S-3 and gear position-proximity switches never have performed well together, but rarely have they led to an actual collapsing of the gear.

The good news was we had a wingman, and we were over our home field. Surely nobody else would be landing at 2100; all the other Jacksonville-based squadrons no doubt were at home watching "Lost."

Unfortunately, my personal episode was just beginning.

Before doing anything, we climbed into a delta pattern and called for our wingman to join. I started to coordinate with tower, the other aircraft, and our SDO, so that everybody would be on the same page—at least that was my intention.

On join-up, our wingman said it looked like the gear were down, with good indexers on the nosewheel. That's a good sign the gear really is down and locked, but good headwork still drives a crew to the PCL just to be sure nothing is missed.

While the pilot maintained pattern altitude, I broke out the PCL. I figured it only should take a minute to locate the procedure and make sure we were doing the correct steps.

As you would expect, considering our situation, I was assigned a tower controller who felt the need to be in the cockpit, even while he dealt with what was becoming a seemingly busy airfield. As we marshaled overhead, a Cessna and P-3 showed up for landing work.

Little did I know that pulling out the PCL at night for a relatively benign problem would test my comprehension of the English language. It was also a test of the helmet-fire system. These are two easy tests to recognize and pass, if you know you're taking them. I saw these tests regularly as an instructor with flailing studs, but I didn't think they still applied to me. And hey, that CRM thing applies only when you can remember the letters, right?

Essentially, my biggest problem was I couldn't seem to locate the correct abnormal-gear procedure. I had found every abnormal-gear procedure in the PCL but the one I needed. Remember that English comprehension thing? The hair stood up on the back of my neck for the first time in 1,500 hours of flight time, and I could do nothing about it. When I couldn't locate a procedure, I asked our wingman and SDO to lend a hand. Unfortunately, that query didn't provide a solution either, because somewhere in the process, I evidently didn't give them all the info they needed to help me. What about the pilot, you ask? Funny, I never thought of asking him if he'd look through the PCL. I mean, if the SDO, wingman, or I couldn't find a procedure, the pilot didn't stand a chance, right?

Suffice it to say, we felt (I think) confident enough the gear was down and locked, so we headed for the runway. Fortunately, the gear was down and locked, but even better was the fact there actually was a procedure for this abnormal event. I didn't figure that out, though, until after I handed the pilot my PCL in the holdshort and said, "Go ahead, you find it." He did find it. He turned the page—a simple task neither the SDO, wingman, nor I apparently could do. Yes, proximity switches fail often in the S-3 world, but what if it wasn't a proximity switch this time? I'd probably be writing this as one of those SWO daddies, wearing black shoes.

A lot was learned from this flight for all paygrades. In this case, the five-step ORM process and just a dash of CRM would have been helpful had I actually used them. As a crew, we never voiced ORM in the cockpit; how many people do? We had more than enough gas, more than enough time, and plenty of outside help to combat this problem, but we let a "demanding" controller and lack of good judgment determine our actions.

Photo by PHAN Chris M. Valdez. Modified.

CRM—how simple would it have been to hand the PCL to the pilot while overhead? Once on the ground, it took him only 30 seconds to find out what I had been doing wrong. Why didn't I do that in flight? Why didn't he pull his PCL out and back me up? It seems really simple and almost unbelievable two qualified crew members could mess up something that seems so basic. This scenario hammers home the fact that 80 percent of all mishaps are caused by aircrew. It's a sobering piece of irony to know the aircrew avoided a mishap because the airplane rushed in to the save the day.

LCdr. Staffieri flies with VS-22.

Unscheduled Stop in Hotlanta

By Lt. Christopher P. Penn

My scenario started when the wing asked if any squadron wanted to provide a static display for an airshow at Seymour Johnson Air Force Base. I asked my fellow junior officers if they were interested but couldn't find a pilot who was available.

I still wanted to go, so I asked a friend from a sister squadron. I wasn't sure if my skipper would buy off on the plan, but it was worth a shot. To my surprise, the skipper approved my request. He said I could take any pilot, as long as I signed for the plane. Great! We had a crew, and we were set for the weekend.

The crew brief covered all phases of the flight. The plan was to fly the first leg to NAS Pensacola, stop to refuel, grab lunch, and then relaunch for the second leg into Seymour Johnson. We looked at the aircraft-discrepancy book (ADB) as a crew; the aircraft was up. The man-up, preflight, start, and taxi went smoothly, as expected.

Unlike my copilot's sister squadron, we had the oldest E-2C version in the fleet. This fact readily became apparent when my trusty copilot had difficulty getting the carrier-airborne-inertial-navigation system (CAINS) to work. His squadron did not have the CAINS system; however, this was a minor issue because I had a good GPS-navigation source and a TACAN. I remembered thinking, however, I should have briefed CAINS operability in more detail. That detail had been lost in our zeal to get on the road. Even though I just unwittingly had thrown my Hawkeye 2000 copilot back into the stone ages with our older navigation system, I felt we could overcome this hurdle with a little crew resource management (CRM).

We took off from Norfolk and started our first leg to sunny Pensacola. After getting to our final altitude and allowing my copilot to get comfortable with the CAINS, everything was set. The flight was going roughly as planned. We barely had reached the halfway point and were over Atlanta when our problems started. Out of nowhere, the right propeller began to surge and make audible pitch changes. The right turbine-measured-temperature (TMT) gauge began to fluctuate wildly. So, I elected to go through the engine-propeller-fluctuation emergency procedure. With no electronic-propeller-control (EPC) light, and the propeller auto-feather switch already turned off, I reduced the power lever on the right side to about half quadrant. I then placed the digital engine control (DEC) to limiting. The TMT reading settled back to within limits.

We discussed what had occurred and decided to continue on our way. The fluctuations returned just five minutes later. I immediately placed the DEC in off. The TMT kept jumping around, and the propeller made small, audible pitch changes. In the face of these challenges, crew coordination could not have worked better. We immediately decided to divert into Dobbins Air Reserve Base (ARB) at Atlanta.

The copilot began to work the divert. Meanwhile, the CICO in the back of the aircraft already had broken out his PCL. He started to go over the engine-propeller emergency with me by reading the notes, cautions and warnings. As a crew, we decided to leave the right power

lever at flight idle and only use it during the landing, if needed. The audible propeller fluctuations had gone away, and other than having the DEC off, everything else seemed normal.

We received our clearance from Atlanta Center to proceed to Dobbins ARB, and we soon were on final. When we touched down, both power levers were moved to flight idle and both BETA lights illuminated, which is a positive indication that reverse thrust is available. However, as I began to pull the power levers into the BETA range, the BETA on the right side was not available. The resulting asymmetrical thrust caused the aircraft to swerve violently to the left.

I quickly pulled the power levers out of the BETA range and into the ground range. I grabbed the nosewheel steering to stop the aircraft from going any farther left and told the copilot to secure the right engine. I immediately received concurrence from the copilot to secure the right engine, and we brought the aircraft back to runway center. We finished the rollout and taxied clear of the active runway. When the wheels were chocked, we shut down the left engine. We were grateful to have maintained control of the aircraft and prevented it from departing the runway.

The availability of BETA clearly was indicated in the cockpit by the illumination of the BETA lights. The new propeller 2000 (NP2000) system states the presence of BETA lights means reverse thrust should be available. We clearly were in uncharted waters. We later discovered that while the EPC monitors several aspects of the propeller system, it does not monitor or recognize every malfunction that may exist.

The maintenance rescue team arrived the next day and discovered a failed actuator-valve module (AVM). Nothing in the cockpit had indicated a failed AVM was the root of our problem. The AVM had failed so badly that, when shaken by a maintainer, the broken parts sounded like a maraca. With an unrecognized AVM failure, the blade angle on the right propeller never had changed. When we retarded the power levers into the BETA range, we caused asymmetrical thrust and the resultant abrupt swerve.

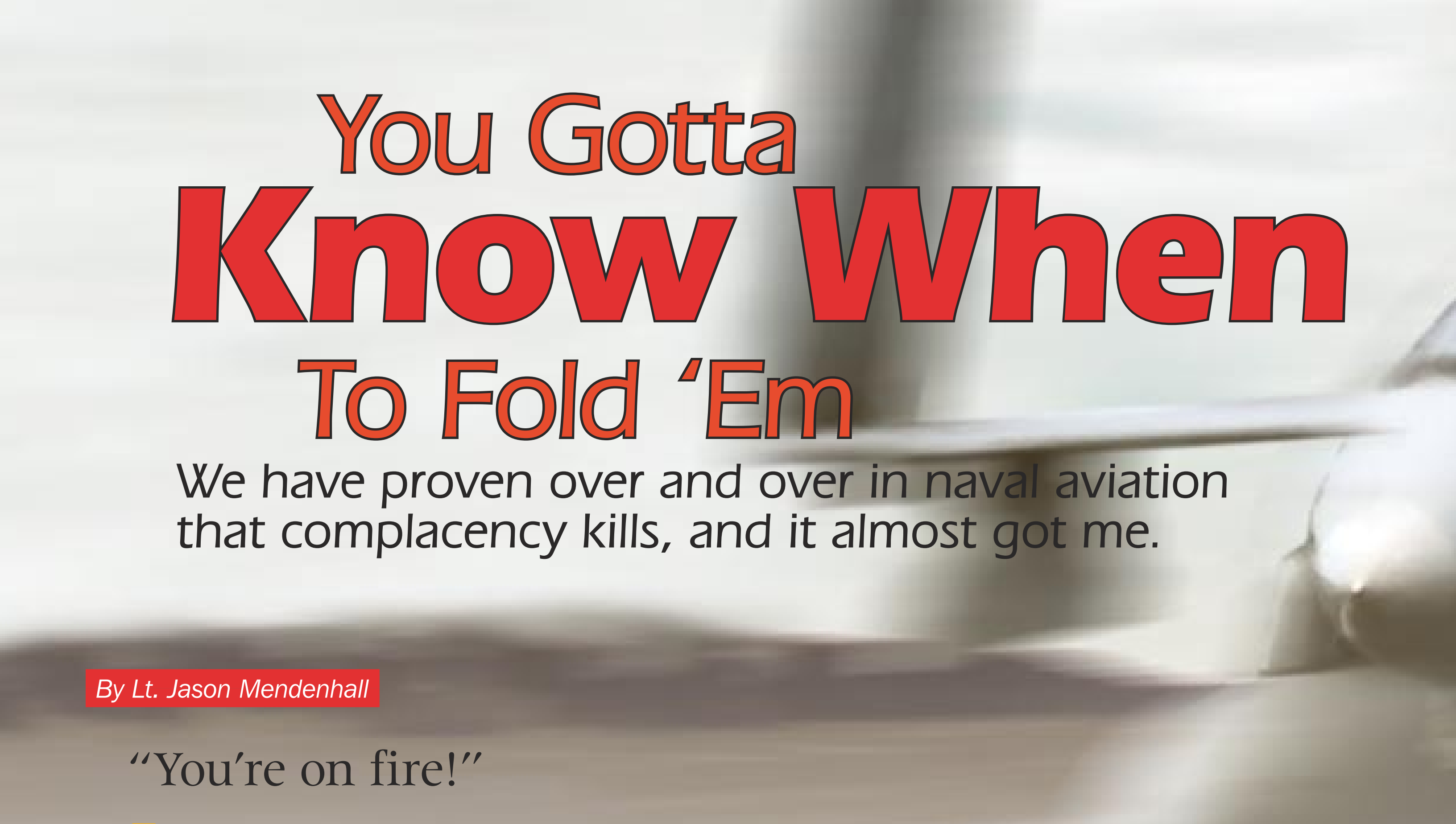
We did everything right, yet still came close to departing the runway.

While the NP2000 system continues to be a challenge for the Hawkeye community, the crux of this article can be applied to any aviation platform. It all starts in the brief. The copilot was not in my squadron and never had flown with me before, so we made sure we briefed the standard NATOPS material and reviewed all the major emergencies procedures. While we encountered some minor idiosyncrasies because of the differences in model Hawkeyes our respective squadrons fly, we overcame them through the incorporation of basic fundamentals of ORM and CRM.

Finally, this experience taught us the importance of knowing standard NATOPS procedures. Because we knew our procedures cold, it allowed us to remain flexible in an unforeseen situation and to minimize the impact of the unexpected AVM failure. I was glad we had covered fundamental emergency procedures in our brief. When confronted by an unforeseen problem on landing, we were not in a position to discuss it, only to act as a crew to prevent the aircraft from departing the runway—as we briefed.

Lt. Penn flies with VAW-124.

Composite image.



You Gotta Know When To Fold 'Em

We have proven over and over in naval aviation that complacency kills, and it almost got me.

By Lt. Jason Mendenhall

"You're on fire!"

Although never spoken, the signal from the nearby and out-of-breath petty officer was clear: "Get out now!"

As I stood at the end of the runway, staring at my partly burning jet, thankful to be alive, I considered the events of that fateful day in Al Asad, Iraq.

My mission for the day had been to operate the new shared-reconnaissance pod (SHARP), as our strike group entered its final two weeks in support of Operation Iraqi Freedom. After launching from the ship and checking in with "Ali Center," I was told my Air Force tanker was cutting short its mission because of a mechanical failure. This change in plan would require me to collect images of my assigned target areas, transmit them to the ground station in Baghdad, and then head west to Al Asad for fuel.

Despite many briefs on divert options and a thorough in-flight review of the local procedures, I remained somewhat uneasy with the prospect of a fuel divert into an Iraqi airfield. Also, recent mishaps at this base had emphasized the importance of increased vigilance while operating in and out of the area. Unfortunately, my cautious attitude would subside after landing. I was relieved to be safe on deck, and excited to see the numerous MiG-25s and burned-out, armored personnel carriers from the opening days of the war. The hairs on the back of my neck settled as I snapped a couple of pictures and took on the last bit of fuel before I taxied.

As I made the U-turn back through the hot pits located next to the hold short, I opted to leave my wings folded. My intent was to return to my checklist page after I had considered the unique departure procedures out of Al Asad. I called for takeoff, but in my rush to get airborne, I did not return to my checklist. After confirming my takeoff clearance with tower, I immediately advanced the throttles to military and released the brakes. I received all of the visual and aural indications one would expect. At first, I thought I had missed arming my seat, but it had been armed. My attention then turned to the DDI (digital-display indicator), where I only saw the "CK FLAPS" and "CK TRIM" cautions. There were other problems, however, including the "FCS" caution, BLIN codes, and various channels of my FCS page X'd out. As I continued to accelerate and maintain centerline, I completed the two items I thought had been forgotten: flaps and trim. Believing I now was configured for a normal field takeoff, I continued the roll.

As I pulled back on the stick at about 140 knots, I heard my call sign used in an abort call coming from a fellow aviator, who was parked on a nearby taxiway. After I took a few seconds to process that radio call, I initiated the abort procedures at nearly 190 knots. Finally, I


Photo by MCS3 Jon Hyde. Modified.

realized what was happening and placed the wing-fold switch into the spread position. I made sure the flaps were in full and tried to get as many surfaces into the wind as possible to help slow the aircraft. Not certain I had enough runway remaining, I decided to take a long-field arrestment. Afterward, I inadvertently set the parking brake. I then saw the ground crew pointing at the smoke coming from my left main-landing gear.

Only a couple minutes later, the left brake caught fire. Rescue crews then risked their lives to battle the flames torching the left main landing-gear door and a full drop tank that was next to a live GBU-12 and a $5-million SHARP. The rescue crew expertly extinguished the fire and saved the plane. After a remarkable repair job by maintenance personnel, I flew back to the ship.

Many things went wrong that day, and I was the culprit. First, I let down my guard and became comfortable with the situation on deck. Even though, in several ways, the airfield resembles Fallon, there are major differences. Operations at Al Asad are by no means standard, and to treat them as such is asking for trouble.

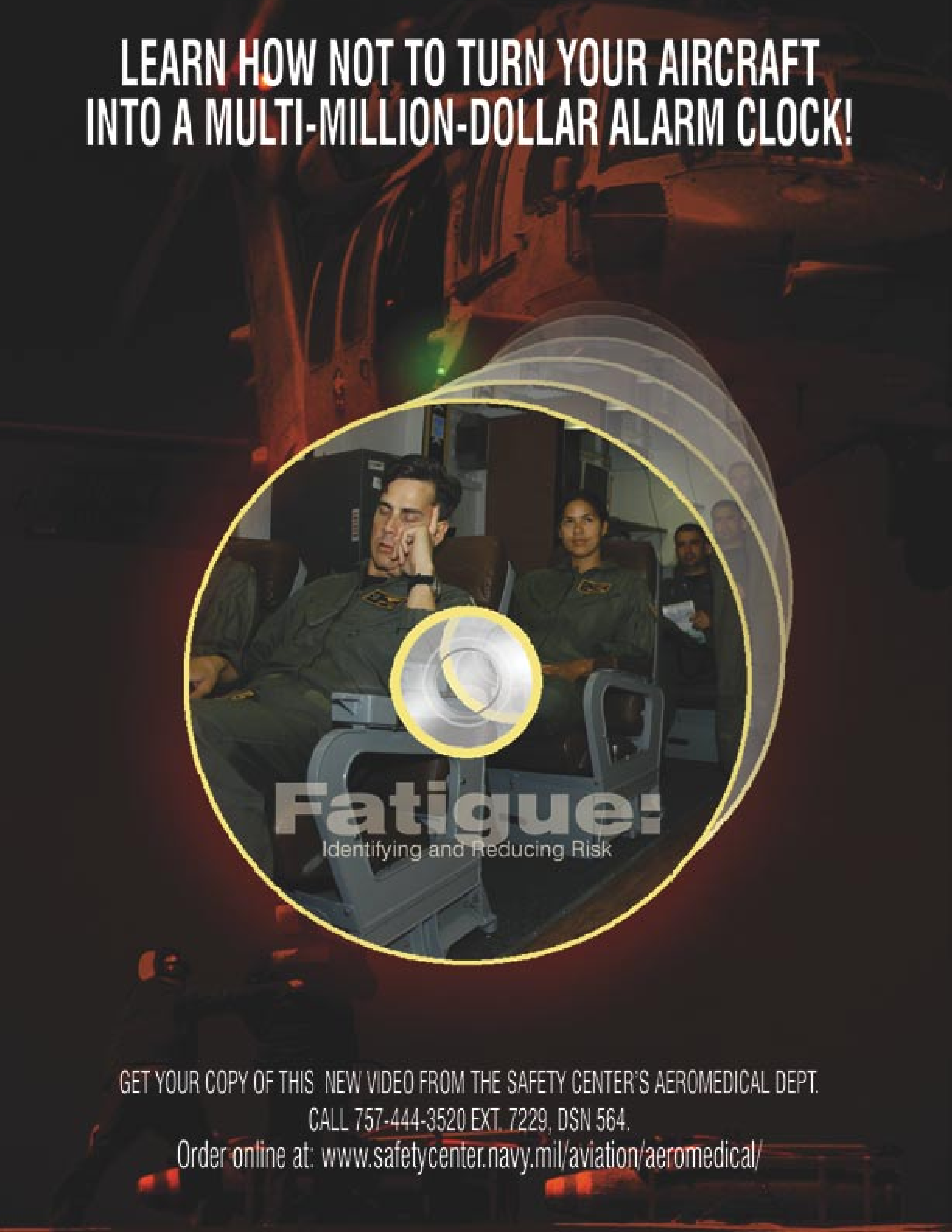
We have proven over and over in naval aviation that complacency kills, and it almost got me. Nothing is routine about combat operations or field ops after four months at sea. The administrative portions of a flight are most likely to kill us. Whether it's dropping the pack on the way home from a level-3 upgrade hop, or that initial join-up after takeoff, critical phases of flight always require our utmost attention—that's where we are most at risk.

My second mistake was to break a habit pattern. Checklists and habit patterns exist for a reason. There always will be distractions within the cockpit, and outside environmental factors always will compete for our attention, especially when operating somewhere like Iraq. The disciplined use of checklists will reduce the likelihood of a mishap.

Finally, I was overconfident in my abilities. By not adhering to my abort criteria, I assumed, at least subconsciously, I had the skill to identify why the master-caution light was on and to correct those items while on the roll, rather than simply aborting the takeoff. Before this mishap, I was the guy who said nothing like this ever would happen to me—I was wrong. Thank God, a CRM-conscious pilot had the presence-of-mind to switch to tower frequency and pull me out of my funk with the use of my call sign.

While I'm very thankful no one was injured and I'm still flying, only one thing stands between this type of mishap and a similar one for any of us: professionalism. Being a professional is a constant pursuit, and it should breed every other aspect of safe aviation, from tactical ability to flight discipline.

Lt. Mendenhall flies with VFA-115.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