THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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Approach

ARE YOU READY?

Fatigue - the aeromedical factor most frequently cited in Class-A flight mishaps.

Safety Award Winners for 2008

The Navy & Marine Corps Aviation Safety Magazine
May-June 2009, Volume 54 No. 3
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Mishaps cost 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. 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; the time to learn to do a job right is before combat starts.

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Thanks for helping with this issue…

Lt. John Campigotto, HSC-21
LCdr. Taz Lumpkin, VAQ-139
Maj. Don Lopez, USAF, VT-4
Mr. Rob Koon, NAVAIR
LCdr. Stan Fisher, HSL-49
LCdr. Matthew Menza, VAQ-130
LCdr. Chris Stersic, VT-2
Capt. "Frenchy" LeClaire, USMC, HMM-264
LCdr. James Haas, NSC

Front cover: Photo by MCS3 Ricardo J. Reyes.

The Initial Approach Fix

Command Excellence Through Safety

The Chief of Naval Operations and the Commander Naval Safety Center are proud to announce the winners of the CNO Aviation-Related safety awards for CY 2008

CNO Aviation Safety Award

These award winners are recognized for their professionalism, commitment to excellence, solid leadership and competent risk management which resulted in safe and effective operations.

COMNAVAIRLANT
VFA-131 VFA-103 VAW-124 HS-3 HSL-48
HSC-26 VP-30 VS-22 VX-1

COMNAVAIRFOR
VFA-192 VFA-27 VAW-115 HS-6 HSL-49
HSC-21 VPU-2 VQ-1 (EW) VQ-3 (TACAMO)
VAQ-134 (Expeditionary) VAQ-139 (Pac deployed)
VAQ-130 (Lant deployed)

COMMARFORCOM
VMFA-122 VMGR-252 VMM-266 VMAQ-3
VMM-162 VMAQ-1 VMU-2 HMH-464
VMR-1 VMFA(AW)-224

COMNAVAIRFORES
VP-62 VR-46 VR-51 VR-57
VR-62 HSC-85 VFC-111 VAQ-209

COMNAVAIRSYSCOM
VX-31 FRC, Southeast

CNATRA
VT-2 VT-7 VT-10 VT-21
VT-27 VT-35 HT-18

COMMARFORPAC
HMM-262 VMGR-152 VMGR-352 HMLA-267 HMH-363
HMM-364 HMM-166 HMM-161 HMLA-169 HMLA-369
VMA-311 MCAS Yuma VMFA(AW)-242

COMNAVAIRFORES
VP-62 VR-46 VR-51 VR-57
VR-62 HSC-85 VFC-111 VAQ-209

CG FOURTH MAW
HMM-764 HMLA-773 (-) HMLA-773 Det. A HMLA-773 Det. B
VMGR-452 HMM-774 VMR Det. Andrews

Naval Aviation Readiness Through Safety Award and the Adm. James S. Russell Naval Aviation Flight Safety Award

Presented annually to the controlling custodian that has contributed the most toward readiness and economy of operations through safety. The command selected must have an outstanding safety record, an aggressive safety program, and an improving three-year safety trend.

Winner: Commanding General Fourth Marine Aircraft Wing

Admiral Flatley Memorial Award

To recognize the CV/CVN and LHA/LHD ships with embarked CVW or MAGTF, which surpass all competitors in overall contributions to safety. These teams are selected based on operational readiness and excellence, and an exceptional safety program and record.

Winners: USS *Abraham Lincoln* (CVN 72) and Carrier Air Wing 2
USS *Tarawa* (LHA 1) and 11th Marine Expeditionary Unit

Runners-up: USS *Theodore Roosevelt* (CVN 71) and Carrier Air Wing 8
USS *Kearsarge* (LHD 3) and 22nd Marine Expeditionary Unit

Grampaw Pettibone Award

Presented annually to the individual and unit that contributes the most toward aviation safety awareness through publications. Grampaw wants to point out the new media category.

Unit awards: Winner: HSL-49 Runner-up: VT-10
Individual awards: Winner: Lt Rob Littman of VFA-81 Runner-up: AE2(AW/SW) Stephanie Teixeira of VFA-136.
Media award: Winner: LCdr. Emerson Stearns, TW-6

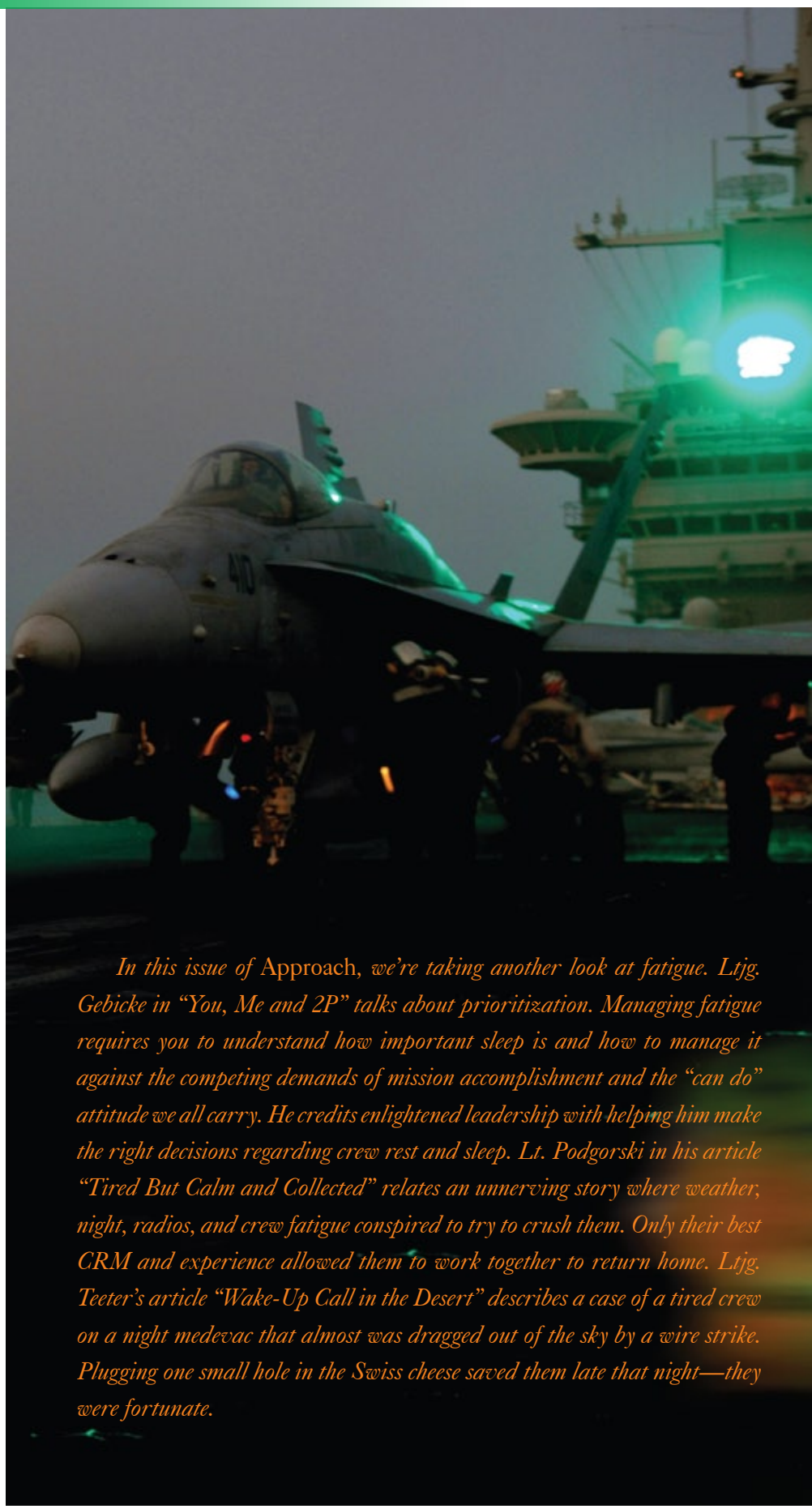
Focus on Fatigue

For most aviators there aren't enough hours in the day to do everything that needs to be done. So, where does proper rest fit into your priorities? Our aeromedical experts want you to know that fatigue can kill, and everyone involved in naval aviation must be aware of this insidious mishap-causal factor.

Approach last focused on fatigue in our September-October 2007 issue, available at: *http://www.safetycenter.navy.mil/media/approach/issues/SeptOct07/default.htm*. That issue discussed root causes, assessing how fatigue causes mishaps, who is at risk, and crew rest for reserve aircrew. We included a VFA-32 safetygram, and excerpts from the OPNAVINST 3710.7T instruction dealing with rest and sleep.

This issue brings you an update on the topic with an article by Capt. Nick Davenport, who heads the Naval Safety Center's aeromedical division. While much research is ongoing, increased aircrew and leadership awareness is needed to keep fatigue in our crosshairs.

MORE FATIGUE!
MORE FATIGUE!
MORE FATIGUE!
MORE FATIGUE!
(yawn)



In this issue of Approach, *we're taking another look at fatigue. Ltjg. Gebicke in "You, Me and 2P" talks about prioritization. Managing fatigue requires you to understand how important sleep is and how to manage it against the competing demands of mission accomplishment and the "can do" attitude we all carry. He credits enlightened leadership with helping him make the right decisions regarding crew rest and sleep. Lt. Podgorski in his article "Tired But Calm and Collected" relates an unnerving story where weather, night, radios, and crew fatigue conspired to try to crush them. Only their best CRM and experience allowed them to work together to return home. Ltjg. Teeter's article "Wake-Up Call in the Desert" describes a case of a tired crew on a night medevac that almost was dragged out of the sky by a wire strike. Plugging one small hole in the Swiss cheese saved them late that night—they were fortunate.*

By Capt. Nick Davenport, MC

Yeah, we're at war and OPTEMPO is up; we're mission-oriented folks accustomed to continually doing more with less. We just gut it out and get the job done, right? You're probably thinking, "We're fatigued, and there ain't much we can do about it."

What control do we have over fatigue? Let's look at some key points.

FIRST, HOW SLEEP DEPRIVED ARE YOU?

Most adults need about eight hours of sleep per night to perform at their peak. If you're getting that much every 24 hours, you're probably doing fine. Or you might be one of those individuals who only need six and a half or seven hours of sleep to function normally (but don't bet on it, those folks are few in number). If you wake up before the alarm goes off each morning, leaping out of bed feeling well-rested and energetic, good for you. If you're the only one still awake during a boring afternoon lecture, watching those around you nod

As the sleep debt gets bigger, the pressure to sleep becomes overwhelming.

off, you're in good shape. If it takes you about 15 to 20 minutes each night to fall asleep after your head hits the pillow, you're normal.

Then, of course, there are the rest of us. Late nights, deadlines, night-shift work, early briefs, time-zone travel, deployments, combat stress, and anxiety all compete for limited sleep time. Dr. William Dement, one of the world's premier sleep researchers, estimates most Americans in our 24-hour society have a 25-to-50-hour sleep deficit. For many in the military, we're probably worse. As the sleep debt gets bigger, the pressure to sleep becomes overwhelming. We're not just nodding off at briefings, traffic lights, and general-quarters drills, we're snoring and drooling, as well. No wonder we nap in passageways and sleep like we're in a coma, even next to the arresting gear and the catapults below the flight deck. Getting rid of that sleep debt takes days to weeks, because you have to add that recovery sleep to your normal eight hours per day. You'll notice improvement after a long leave or vacation where you've been getting full-recovery sleep. After two or three weeks, you'll start feeling more alert, energetic and creative.

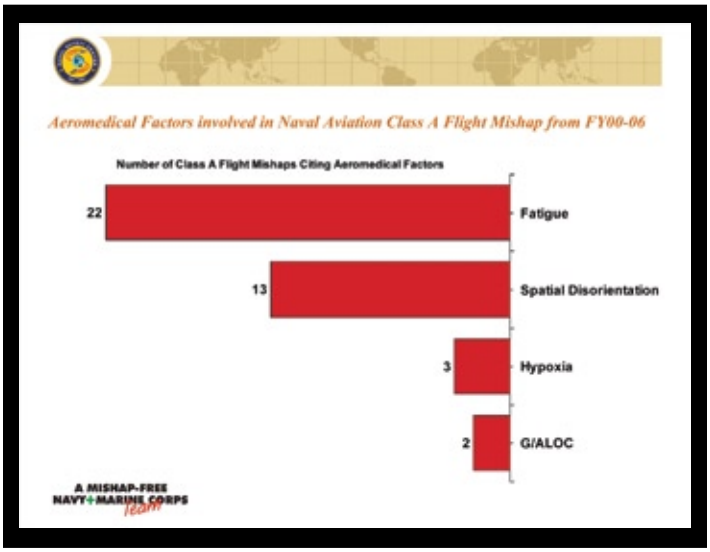
TOO LITTLE SLEEP, SO WHAT?

"All that may be true," you say, "but I'm still able to do the job; if things get tough, I'll just gut it out."

Well, maybe not. If you look at the graph, we've still got a long way to go. Fatigue from sleep deprivation, acute and chronic fatigue, and circadian-rhythm disruption exceeds all other aeromedical causal factors in Class-A flight mishaps, and hazard reports, combined.

Safety Center analysis of Class-A flight mishaps for FY00 to FY06 has found the percentages of the following fatigue-related HFACS nanocodes: fatigue-physiological/mental, circadian rhythm desynchrony, and inadequate rest, in the aviation communities listed in the table.

These results are influenced by accuracy of reporting and type of aircraft and mission.



Fatigue-associated HFACS nanocodes in Class A flight mishaps, by aircraft type.

• USMC	H-53	57%
• USMC	H-46	29%
• USMC	H-1	23%
• USN	FA-18	21%
• USN	H-60	20%
• USMC	FA-18	10%
• USMC	AV-8B	05%

Provided by Cdr. Don Delorey and LCdr. Jeff Alton

Fatigued people are not very aware of how impaired they are, and as the fatigue mounts, that lack of awareness gets even worse. Just like the drunk at the party, they may think they're doing well when fatigued but not be in condition to handle anomalies, emergencies or unexpected changes in plans. Functioning at 75 percent of baseline capacity might be good enough if the mission isn't very challenging, and there are no surprises. But, if a flight suddenly demands high-level decision-making and performance, you may not have the reserves to function successfully. Many mishaps begin with a minor distraction, which starts to consume limited brain resources, while the bigger picture gets lost.

What about the adrenalin rush (that "fight or flight" response) that comes with surprises and emergencies?

Doesn't that restore alertness and brain function? That huge jolt of adrenalin restores alertness for only a short while, maybe five to 10 minutes. Then fatigue comes right back, and we're just as degraded as before. This scenario is typical of the late-night driver, who is jolted awake by the sound of rumble strips on the tires. While he makes it another five miles down the highway, he then falls asleep and crashes. Often times, we get that first shot of adrenalin after the mishap has occurred. Also, although that adrenaline rush might wake us up, it doesn't necessarily restore our ability to think clearly.

THE EFFECTS OF PRACTICE.

High-level decision making, cognitive function, mood, multi-tasking, situational awareness, and vigilance are all very sensitive to inadequate sleep. Operational-risk management and crew-resource management depend on these cognitive capacities. Conversely, well-rehearsed motor skills and simple, familiar procedures are resistant to inadequate sleep. However, the kinds of thinking often required in an emergency situation such as, the ability to come up with novel solutions during rapidly evolving situations, are those that cannot, by definition, be practiced. Therefore, inadequate sleep combined with an emergency situation equals a disaster waiting to happen.

What about practicing in a fatigued state to be more resistant and familiar with how to control fatigue? Do you cope better if you train fatigued? Of the sleep deprivation experts I've asked, none know of any scientific evidence to support this belief. In fact, evidence shows that the ability to learn is degraded by inadequate sleep. So, if you train while you're obtaining adequate sleep, you learn faster and better. If you train in a sleep-deprived state, you don't learn as well; you only increase your chances of having a training mishap.

HOW ABOUT DRUGS?

Several drugs are available to manage fatigue on a short-term basis. One of the most available is caffeine, which affects the brain, improves alertness and cognitive performance. Science shows that two to three typical, eight-ounce cups of coffee, each containing 100 to 150 mg. of caffeine, will help promote alertness for three to four hours. Energy drinks contain twice as much, and your venti-Starbucks coffee may top out at 400 to 500 mg. of caffeine. Coffee ice cream and chocolate have some caffeine (30 mg.), which is not enough to improve performance and alertness. Caffeine is still effective even if you use it regularly, although you might need more than someone who doesn't regularly use it.

More potent drugs, such as amphetamines, do work but are restricted for use only "in extreme operational necessity or combat." They require strict prescribing and accounting of medication, and pretesting. Talk to your flight surgeon for more information when these drugs might be considered.

As with all stimulants, caffeine included, fatigue still is present, only temporarily masked by the drug. Increasing sleep debt requires increasing amounts of the drug to sustain performance. Even caffeine can have side effects, such as irregular heart beats, stomach upset, and elevated blood pressure. Until the effects of the drug wear off, getting to sleep afterward can be difficult, so planning ahead is crucial. For these reasons, managing fatigue with drugs requires a well-thought-out plan, preapproval and testing, and flight-surgeon supervision. Drugs are the last choice to maintain performance after all other countermeasures have been implemented.

SLEEP

Nothing fully restores the brain's computational ability and performance except sleep. It doesn't matter where you get your sleep; it's just a matter of quantity. Sleep obtained in chunks still recharges the brain, and restores cognitive functioning. If you spend a night tossing and turning, and periodically waking up, you still get the benefit of the sleep time you did accrue—it all adds up.

For instance, if you have to work a night shift, take advantage of the afternoon lull in alertness and nap from 1400 to 1700 before you go on duty.

Getting to sleep can be difficult because of stress, anxiety or trying to sleep when the circadian-alerting cycle is stimulating the brain, particularly during the last three hours of the day before normal bedtime. With circadian dysrhythmias or chronic-sleeping difficulties, consult your flight surgeon for more help.

Suggestions to maximize the effectiveness of sleep:

Try to standardize your sleep period. Get up at the same time each day, even on weekends. To add sleep, go to bed earlier at night, rather than sleep in the next morning (the latter shifts your circadian clock, which is generally undesirable).

Associate your bed with sleep only. Don't take work to your rack. If you spend 30 minutes in bed and still can't sleep, get up and do something else until you again feel sleepy.

Don't vigorously exercise within three hours of going to bed. Exercise will stimulate adrenalin and raise core temperatures; both interface with sleep onset.

Keep your sleep spaces cool, quiet, dark, and as comfortable as possible. Consider ear plugs.

Block out as much light as possible. Lights alert and influence the circadian cycle. If necessary, duct tape aluminum foil on the windows or wear eye shades.

Stop using caffeine within six hours of your anticipated bedtime to give it time to clear your brain.

Don't drink alcohol to get to sleep. Alcohol makes you feel groggy, but does not promote sleep. Although you are not aware of it, alcohol directly disrupts your sleep.

NAPPING STRATEGIES

In times of high operational tempo, you have to be a combat-nap expert. Use naps to get additional sleep if you don't have time for programmed sleep at night. Sleep of any duration will produce benefit in the brain. The old rules about limiting the length of the nap are outdated, and didn't account for the long-term benefit of the nap. Take as long a nap as you can.

I FEEL GROGGY AFTER A NAP AND CAN'T SLEEP LATER THAT NIGHT.

"Sleep inertia" is that feeling of grogginess you have for about 15-to-20-minutes after awakening from a nap. Science shows that it's a direct carryover of the state of the sleeping brain into wakefulness. Cognitive performance is impaired during the first five minutes, but this impairment dissipates rapidly over the next 15 minutes or so. Avoid any activity that requires peak performance during the first five minutes.

A huge amount of scientific literature on fatigue and sleep deprivation exists, and research is giving us much better tools to understand and control fatigue. Software modeling of human fatigue and performance recently has proved successful and promises to greatly improve our ability to predict when fatigue effects will occur. Such tools as FAST™ (the Fatigue-Avoidance-Scheduling Tool) are used to analyze the fatigue component of mishaps, and programs in development, such as the Air National Guard's FlyAwake, promise to revolutionize scheduling. For more info, visit the NSC website at *http://safetycenter.navy.mil/Fatigue/index.asp*.

For now, that's probably enough to put you to sleep for this issue of *Approach*.

Capt. Nick Davenport is the head, Aeromedical Division, Naval Safety Center. Dr. Nancy Jo Wesensten, Ph.D., Task Area Manager, US Army Medical Research and Materiel Command Sleep and Fatigue Program, Walter Reed Army Institute of Research, contributed to this article.

FlyAwake: Fighting Fatigue

Recognizing the value of fatigue modeling, the Air National Guard Safety recently developed a user-friendly overlay on the SAFTE model, called FlyAwake. Pilots, schedulers, physiologists, and mission planners participated in developing the initial application, to ensure a product that meets warfighter needs. Thanks to a grant from the Defense Safety Oversight Council, the ANG has partnered with the Naval Safety Center, the Walter Reed Army Institute of Research and the Naval Postgraduate School to bring FlyAwake to Navy operations as one component of a comprehensive risk-management program. View it at *www.flyawake.org*. An enhanced version will be available later this year.—Capt. Lynn Lee, Air National Guard Safety.

You, Me, and 2P

By Ltjg. Kent Gebicke

Time management and sleep play a big role in aviation. We know that fatigue can contribute to errors in judgment and response time. We also know too many mishaps occur because of pilot error. At some point in a pilot's career, a situation will arise that pushes his crew-rest limit. That situation occurred on my first deployment.

The typical manning for a single plane, light-airborne-multipurpose-system (LAMPS) detachment consists of an officer in charge (OinC), at least one helicopter aircraft commander (HAC), and two helicopter second pilots (H2Ps). This staffing allows for two operational crews in a single helicopter detachment. A HAC is responsible for filling the maintenance officer billet, considered the most involved job, with the remaining pilots taking the operations, training and administration jobs. This structure allows the detachment to flow smoothly, with adequate aircrew rest. My detachment was manned differently, with only one H2P—me.

I consider myself a very capable individual; however, sometimes, too much is too much. The OinC was vigilant when it came to detachment safety. In every case, he put safety above all else. On more than one occasion, he told me to stop working and get to bed. This mindset was a difficult concept for me to grasp.

As a person who is very concerned about my reputation, I bust my hump to complete all assigned tasks. If this meant getting less sleep, then I was OK with that; OPNAV 3710 and my OinC, however, were not. After many long hours, I now know why. All of my jobs were full-time responsibilities. Furthermore, with a shortened deployment, I would need to do in three months what others had twice that time to accomplish. The addition of eating, working out, eating, studying, eating, and flying, did not leave much time for sleep. I sometimes found myself running ragged.

Three months is not a long deployment. As the only 2P, it felt like we were gone much longer. I was spent upon return, physically and mentally. Having a "can do" attitude, I did not bring my condition to the attention of my HACs or OinC, which would have been the prudent thing to do. I tried my best not to let my collateral duties affect my performance, and for the most part, they did not. However, I didn't always bring my "A" game.

Eventually, the other pilots recognized my plight and made it much easier for me to say "no." On more than one occasion, a load was taken off of my shoulders and put on another member of the detachment. As aircrew, the crew-resource-management concept does not stop in the cockpit. On this detachment, it was in full force on the ground, as well. I definitely do not regret being the only 2P on the detachment. It allowed me greater opportunities to earn flight time, learn different jobs, and gain experience as a leader and a pilot.

I will take this experience with me on my HAC cruise and throughout my career. Here's one more valuable lesson: I can't do everything myself. Crew resource management works!

Ltjg. Gebicke flies with HSL-49.

Tired But Calm And

By Lt. David Podgorski

We had been deployed on board USS *Harry S. Truman* (CVN-75) for almost two months, flying daily six-and-a-half-hour missions in support of Operation Iraqi Freedom. We had become comfortable with the missions but felt fatigued from the daily grind of long planning, briefings, flights, and debriefings. At this stage of deployment, the mission itself had ceased to be the challenging part of safely conducting our mission.

In late January, the Mideast weather proved to be very demanding. Throughout the past two months, aircrew had grown accustomed to unfavorable weather in the skies over Iraq. But, we also had become proficient at working as a team with the air-traffic controllers and tanker crews to find clear sky for the three airborne refuelings necessary for each flight.

On this day, and in retrospect, I realized the weather brief that afternoon had called for the worst conditions I had seen in two months. The forecast called for numerous cloud layers between FL180 and FL300, our standard tanking altitudes over the central and northern part of the country. During my crew brief, I focused on the weather as a significant operational-risk-management (ORM) challenge for our evening's flight. I admit, though, I lacked the necessary energy to truly grasp and mitigate this challenge. I briefed a plan to request ATC move our tanker to a relatively clear tanker track. This action would be based on tanker crew-pilot reports, combined with asking the tanker to search for clear air between cloud layers. My plan would prove to be naïve, as the weather and other variables became factors.

The launch and climb surprisingly were easy, and as the sun set in the west, our crew of three relaxed and comfortably steered across Kuwait for Iraq. As darkness set in, and we continued farther north, my comfort zone began to shrink. I gradually became aware of a substantial cloud bank building on the horizon between ourselves and Baghdad. Soon, we were engulfed in true IMC weather, without a single break or hole above or below.

Photo composite image.

Collected

We still had more than 100 miles before our first refueling track, so I decided to do weather reconnaissance to find the layers. I requested a climb from our current altitude of FL200 to FL240. Instantly, the controller's response revealed how difficult the evening would be. He said my request was incomprehensible because of our radio-static problem Prowlers experience when entering heavy cloud layers. All we heard on the radios was the familiar screeching sound of the EA-6B radio phenomenon called "p-static."

TO OUR ADVANTAGE, the controllers were not very busy that evening, and they repeated their clearances multiple times. Our six ears in the cockpit strained to understand enough to keep us safe and honest; we focused on the word "cleared" and a corresponding altitude. We repeatedly struggled through this procedure, eventually getting clearance from FL200 to FL240, then to FL260, and eventually to FL280. No altitude offered any clear air or clear communications. It was night; we only had night-vision devices (NVDs), no air-to-air radar, and we needed gas—quickly.

While searching for clear air, we gradually made our way to just outside the tanking area, west of Baghdad. When we heard through the p-static, the controller abruptly vectored us east. Our tanker, operated by a veteran RAF crew, had been on the move all evening, searching for clear air. We expected they had found some to the east.

We entered the track on altitude in the mid 20s, checked in with the tanker, and followed vectors from the controller to rendezvous. Distance on the air-to-air TACAN steadily decreased to within two miles, then rapidly began to increase. I strained my eyes, scanning between my NVGs and the unaided black sky. At two miles, we had no tally. I now had a constant running dialogue with the controller, updating vectors that eventually navigated us an entire lap around the refueling area. We began a second lap while the TACAN distance repeatedly increased and decreased.

Finally, through assistance from the tanker crew, we closed to within a mile, and my pilot slowed his closure. We had been advised chicks were in tow, and I saw a faint but familiar green glow through the haze to my right. We established ourselves at a mile on the port side of the tanker, while several Hornets continued fueling, and I padlocked the faint green lights.

As the Hornets fueled, we watched the lights get even fainter. They disappeared, with the TACAN showing less than a mile. We lost sight. Immediately, my pilot separated, as I cleared it on the radio through the p-static, and we worked with the tanker to find a clear altitude for us. We waited at a safe distance because he reported conditions were thick from FL180 to at least FL290. We went back in the mid 20s; coordinated a safe, slow rendezvous; and finally got the needed fuel.

OVER BAGHDAD, NEARLY 30 MINUTES LATE for our tasking, we were abruptly redirected to the far north of Iraq, as far as possible from our carrier. The transit was in thick IMC conditions, and as the evening progressed, the weather declined. Each tanking evolution grew more difficult than the one before. We repeatedly lost sight, battled the loud radio p-static, and searched for clear air to finally join on various tankers.

After we topped-off with our final tanking southeast of Baghdad, we headed south toward the Gulf at FL270, still in mostly IMC. This short time in transit was the most relaxing moment of the flight for our exhausted crew; we enjoyed some radar deconfliction over the unpopulated southern desert between Iraq and Kuwait. We still continued to battle incoherent communications and observe massive convective cells to the southwest through the occasional cloud breaks. Our fuel gauge showed a comfortable 15,000 pounds, with 7,500 pounds in the main tank, and holding steady. My pilot and I then noticed the low-fuel light quickly going on and off. I was in disbelief as this is a land-as-soon-as-possible emergency. Calmly, we all took a deep breath and discussed what we saw. This moment of calmness created clarity and smooth crew-resource management (CRM) that would prove critical as we handled the situation.

Our divert was challenging, complicated by incoherent communications and relative distance to suitable diverts and the ship. A further complication was the massive convective buildups with frequent lightning flashes we had noticed to the southwest. Bad weather stood between us and divert fields in Kuwait. However, direct distance to the briefed PIM was not significantly greater than our best diverts, and we had observed considerable less convective activity toward the Gulf. Our discussion included an experience of our mission commander. He had witnessed a low-fuel light at high altitude with associated cold OAT, but it had proved invalid. So, with no visible evidence of a loss of fuel, we decided to spend a couple of minutes observing the low-fuel light that was cycling on and off.

The low-fuel light was on when I checked-in with marshal, but as we comfortably descended through the overcast under radar control, we finally found the ship operating in the clearest sky we had seen all night. As predicted, the low-fuel light extinguished and stayed off for the duration of the flight, fortunately proving to be invalid, with the cause never determined.

Initially relieved our gamble had paid off, we were in clear air for the first time in six hours, and the radios again were understandable. We took this opportunity to clarify our situation with CATTC and immediately received vectors to final. Unfortunately, the most difficult part of our night was about to begin, as we descended from clear air at 6,000 feet into a thick haze at 1,200 feet: a combination of fog and fine, windblown sand, common in the Gulf during stormy winter weather. My pilot continued inbound, and we started our final descent at three miles, down to two miles, then one mile, and at three-quarter mile, the final controller asked me to call the ball. As we had been for most of the flight, we were completely IMC. My pilot called "clara," and at just within a half-mile, a blur of lights appeared, but it was too late because we heard the "wave off" call.

For the second time that flight, our exhausted crew took a deep breath and discussed the situation. We cleared our heads and then calmly discussed options. All of us were drained of energy, but we knew the conditions across the region were not going to improve, and we needed to get aboard.

Although the visibility was no better, we were calm and prepared, and successfully trapped the second time. At the debrief, I realized that the two moments when we just took a deep breath to calmly discuss our options during the flight were the reason why we were back aboard. The right combination of good CRM and calm analysis were what was needed. The lessons learned that night would be applied many more times during the deployment.

Lt. Podgorski flies with VAQ-130.

Photo by MCSN Zach Hernandez, Modified.

Wake-Up Call in the Desert

By Ltjg. Dan Teeter

I have been told Navy flying is far more dangerous than Army flying. The argument asserts that flying over land affords you terrain references and contrasts, more accessible fuel, and emergency-landing sites; all you have at sea is an infinite expanse of water. The hole in this argument never was more apparent to me than following a recent near-mishap I experienced.

Countless overland flights in Kuwait and southern Iraq have taught me the overland environment should not be taken lightly. Some of the flying is easier and even safer, but the desert quickly will remind you that overland flying can be just as dangerous as maritime flying, if not more so at times.

As with many mishaps, my near-mishap resulted from several causal factors, rather than one isolated factor. My incident occurred in the expanse between Udairi, Kuwait, and Tallil, Iraq, which the local Army helicopter pilots not-so-endearingly call, "Davey Jones Locker." During my several months with the 2515th MedEvac Unit, I had completed countless patient transfers between Tallil and the Expeditionary Medical Facility in Arifjan, Kuwait. This medevac appeared to be no different.

Photo composite image.

Realistically, we often don't use charts, because anyone who has flown in the desert knows a chart is useless without ground-navigational references.

It started like all others, with "Medevac, medevac, medevac, 1st and 2nd up" broadcast over the squadron radios. It was 0230 in the morning, so I rushed out of bed, suited up, geared up, and ran to start the helicopter. Tallil had an Army sergeant experiencing testicular torsion (a terribly painful twisting of the testicles), and they wanted to move him to Arifjan for surgery as soon as possible. My crew was assigned wing responsibilities for the flight, and the other aircraft would pick up patient.

WE SPUN UP AND LIFTED without incident. As we checked out with the Kuwait air-traffic controllers and pressed toward Iraq, we anticipated the flight would be yet another routine run between the two bases. Little did we know that the "Swiss cheese" holes were lining up.

Our formation descended to 300 feet AGL, the standard night altitude in Iraq, as we crossed the border. Low-altitude-terrain flight was the first hole in the cheese. The cultural illumination disappeared, and the zero-illumination night became extremely apparent (our second hole). We began to enter and exit dust clouds that extended well above us and obscured the horizon (our third hole). We stayed low to maintain ground reference in the absence of a horizon. Finally, we had two tired crews as we entered the flight phase—when nothing happens. Complacency rose as our crews began to drowse. I was flying, so I snuggled up within three rotor diameters of lead and established a step-down to improve my sight of lead.

The 80-mile expanse between Udairi and Tallil is an uninhabitable tract of desert. Almost nothing exists between the two bases, except vehicle and tank wreckage from the first Gulf War, distant flare pipes that bloom you out, and high-tension power lines. The power lines crossed at unpredictable intervals toward the end of our transit, and they ranged in height from about 150 to 200 feet AGL. At 300 feet at night, we try to mitigate their hazard, and we use charts to anticipate

No member of my crew saw the 200-foot-high power lines as we approached them.

their proximity—at least that's the plan.

Realistically, we often don't use charts, because anyone who has flown in the desert knows a chart is useless without ground-navigational references. See-and-avoid is the common rule to clear the wires, and this practice had been effective so far.

Just about the time power lines began to appear, the flight became more communication intensive. Lead had to contact Ali approach and Ali tower, while wing had to contact the Tallil medevac unit to coordinate the patient pickup. Lead seemed to have enough difficulty just maintaining good airwork. Now they, and we, had to multi-task on our radios.

We should have identified the first signs of fatigue in the other aircrew. Lead descended 50 to 75 feet at irregular intervals during the early part of our transit. The descents all were shallow and lasted only seconds before they recovered at base altitude. Still, we didn't have the wherewithal or nerve to challenge their basic airwork. We continued the flight without saying anything.

No member of my crew saw the 200-foot-high power lines as we approached them. At the same time, lead began yet another shallow descent, and I carelessly maintained my step-down without cross-checking my radalt. The next thing I heard was my low-altitude-warning system beeping. It seemed odd, so I checked my radalt, and it read 45 feet AGL for a split second—probably a transient read off of the wires we had crossed.

After a brief moment of silence, my HAC asked the crew what had happened. Our crewman confirmed my suspicions that we had passed over a set of power lines without anyone seeing or announcing them. We contacted lead on our inter-plane frequency, and they reported the same experience. We now were wide awake. We climbed another 100 feet for the remainder of the transit and arrived in Tallil unnerved.

Our lead aircraft picked up the patient at Tallil, and we completed the remainder of the medevac. We estimate my aircraft had crossed the wires within 50 feet, and lead had crossed just slightly above us.

Several of the flight's risks were outside our control, but how our crews mitigated the risks was not. We had briefed the possibility of doing a night flight to Tallil during our previous morning's formation brief, but a simple reiteration of the brief's sticking points may have been enough to prevent the near-mishap. In particular, fatigue-induced complacency, poor communication, and poor situational awareness were our near-fatal errors. All of these factors could have been mitigated with better crew-resource management. Responsibility rests with everyone on the crew, but the HAC and mission commander share ultimate responsibility. They set the tone for the flight, and CRM always will suffer if a crew gets the impression they are tired or disinterested in the flight.

We had little communication within my aircraft or the formation that morning. Considering the environmental conditions and time of day, my HAC and mission commander should have been extra vigilant to maintain good communication and good CRM. They were not, and none of us stepped up in their absence. Had we simply addressed the environmental risks and the importance of keeping each other engaged in the flight, we might have prevented our near-mishap. Instead, our poor CRM and complacency brought us within 50 feet of one of the overland environment's greatest hazards.

If you hear that Navy flying is more dangerous than Army flying, take the comment with a grain of salt. Weather and illumination are no more reliable on land than at sea, and the overland environment sometimes deals you hazards you never would encounter over water. If you dismiss the risks and the need to maintain sound CRM, you may find yourself in a similarly dangerous situation.

Ltjg. Teeter flies with HSC-21.

the jaws of

The minute the mission changes in flight is the minute you need

By Lt. Joshua Fulcher, USCG

The day began just like any normal duty day for a Kodiak, Alaska, Coast Guard C-130 crew. We got to the station at 0745, checked the aircraft book, and got the weather brief from the marine-science techs (MSTs). The weather forecast for this lovely Sunday in July would be, well, terrible. All the airports we could land at in Alaska—aside from Anchorage—were at approach mins, had large doses of Alaskan "liquid sunshine" (rain), and had high winds, which dominate the Aleutian chain.

Our flight schedule called for an afternoon trainer. I contacted the operations officer (Ops O) and recommended we cancel the trainer because of the marginal weather. "Roger that," he said, and we all retired to our offices, checked e-mails, and spent the next eight hours doing battle with every JO's nemesis: collateral duties.

About an hour into the effort to turn the tide in battlefield collateral, "C-130 aircraft commander, contact operations center," blurted from the overhead piping system.

I picked up the phone and fully expected to get briefed on an upcoming search-and-rescue case that would whisk me away from home station. Then I'd be gone for the next three days because of poor weather.

"Ops wants you to see if it's feasible to get into Saint Paul today," the duty officer said on the other end of the horn.

Rewind two weeks. Earlier that summer in St. Paul, the Coast Guard had lost its second C-130 since the service began flying the Herc. The St. Paul under discussion is not the great city in Minnesota. No, St. Paul, Alaska is a very small island, smack dab in the middle of the Bearing Sea. ("Deadliest Catch"

Photo composite image.

DEATH

to sit back and carefully evaluate everything that's going on.

TV-show fans will be familiar with this little slice of Alaskan heaven.) And where have the only Class-A mishaps involving USCG C-130s happened? You guessed it: Alaska. (A note attesting to the skill of that crew and the toughness of the Herc is that, although the aircraft was destroyed, the entire crew walked away from the accident, uninjured.)

Ops wanted me to see if I could get into St. Paul to deliver the mishap-analysis-board (MAB) members to the scene of the crash. The unit had been trying to deliver the board members for almost a week but couldn't because of poor weather. Until recently, St. Paul only had had a gravel runway, but now it's 6,500 feet of state-of-the-art, FAA-approved, grooved asphalt. St. Paul also sports some of the brightest approach lighting ever installed in the history of American aviation, so shooting the ILS in there, even in rotten weather, normally is no big deal. After considering all these factors, and that the weather was reported to be 400 and 1 (a virtual VFR day in the Bearing Sea), I reported to Ops O that, "Yes sir, it should be no problem."

"Make it happen," Ops O replied. I then started to plan my afternoon adventure.

Three hours later, I found myself airborne from Kodiak with these MAB passengers: The CO of another Coast Guard Air Station, the head of safety from CG headquarters, a stan/eval pilot from another large C-130 station, the head of C-130 engineering at another station, and two members of the Coast Guard C-130 standardization team (one of whom was the assistant OinC, and had been my instructor at flight school). All in all, something to the effect of 20,000-plus hours of C-130 experience sat in my cargo compartment, and two of them, including the stan team AOinC, were on ICS.

Our crew was a good one. The copilot was a super sharp "retread" former instructor-helicopter pilot; the flight engineer had been a C-130 navigator, who transitioned into the engineer seat; and the loadmaster was one of our most competent and the load-cage shop supervisor. I couldn't have picked a better crew for this mission. Good thing, too!

The fun began about 45 minutes into the flight. The radio operator relayed, "Sir, district just called and said a 406 EPIRB (emergency-position-indicating radio beacon) is going off about 800 miles south of Adak, and they want us to divert."

"Eight-hundred miles south of Adak, eh?" I said. "Hmmm, that's oh, about 1,200 miles away from our current position."

Almost on cue, the copilot, engineer and I said in unison, "We need gas."

I made a turn to the south, bumped it up to max continuous, and headed for Cold Bay, Alaska. We still were about an hour out of Cold Bay, so we had time to fine-tune our search pattern and do fuel planning. As it turned out, with a full bag of gas, we would have had about an hour on-scene before we would have to depart for Anchorage, our only viable alternate. Our plan was based on getting into Cold Bay for fuel (considering the morning weather brief.) We'll always make the attempt when lives are at stake, so we pressed on to Cold Bay and hoped for the best.

About a half hour out, we picked up ATIS and, sure enough, the weather conditions were miserable: 300 and 1, with fog and high winds out of the west. Wait a minute, didn't they tell me in flight school that, to have fog, you had to have light wind? The ILS will take you down to 200 feet, and there's a wide 10,000-foot runway, so onward we went.

As we got to the initial-approach fix, the radio operator keyed again, "Sir, district says to stand down; they made contact with the vessel, and it was an accidental activation, no distress."

Great. We made a quick radio call to my favorite Anchorage center controller and then headed back on our merry way to St. Paul. We had added around two hours to our flight time and were in the post-adrenaline blahs that follow the initial call for a SAR case. I knew we needed to keep our game faces on because the approach into St. Paul wasn't going to be any better than what we just had faced. I kept the conversations going and talked about how to attack the next airport.

We arrived in the St. Paul area about an hour and a half later to discover the weather-guessers were right: more wind, more fog, and less vis. The ASOS called 200 and one-half, with fog and strong winds out of the south. We felt anxious because the weather was a lot like the conditions the crew of the crashed plane had faced. The rotten weather also was close to the ground. At altitude, it was nice, even sunny in some spots, but when you looked down, the entire area was thick with cloud banks.

Thoughts of crew-resource management (CRM) came to mind. The crew kept talking about the crash, and our pax on headset chimed right in. Can you guess who broke this chain of negative thinking and poor choice of conversation? Credit goes to our trusty, and very experienced, copilot. Having spent many a dark night wearing NVGs and hovering over a sinking vessel in the worst of weather, good ol' Todd reminded us that keeping our heads in the game and concentrating on the important stuff—like landing—was what we needed to do. Freaking ourselves out over a crash that had happened weeks before was going to get us nowhere. This friendly slap in the face was just what the crew needed, as we focused on the approach.

Four, yes four, ILS attempts later found us frustrated. We would get to mins, not see anything, start the go-around, and every time one of the front three then would exclaim, "There's the runway!" Because we had started the go-around, I wasn't about to yank power and push a landing in those conditions. After attempt No. 4, we noted a clear area to the north of the island—a "sucker hole" if I ever saw one. But, there's a sucker born every minute, and the two suckers at the wheel said, "Let's cancel IFR and take a look in that clear area; maybe we can see the north

end of the runway, and actually land with the wind in our face." We were squawking 1200 and on own navigation as we stuck our big nose down into the jaws of death.

Remember I said the wind was strong from the south? If the wind is strong from the south and pushing the fog northward, why would we think we'd see the runway from the north side? But, this concept seemed logical at the time.

We could see what we thought was the outline of the little building to the north end of the runway, and we were painting the shoreline with our radar. I think the words, "Let's go for it," almost escaped my lips when the next link of the mishap chain was broken by an astute, and very assertive flight engineer, who said, "Why are we doing this?"

"Anchorage center, Coast Guard 1700 two miles north of St. Paul VFR. Request IFR pick-up direct Kodiak," I said, and we headed home.

"Eng gets a case of beer for that one," I said.

Pushing a landing to a remote place in bad weather to deliver an inspection team? What the heck was wrong with me? Again, thank the stars for CRM.

The story ain't over yet, campers.

Just about the time we got our clearance and radar identified, the radio operator's voice meekly came through my headset again, "Uh, sir, they (*by now district didn't even get the dignity of being called by name*) want us to divert to St. George to pick up a medevac patient and take him to Anchorage."

St. George is St. Paul's sister island about 40 miles south of where we were. We coordinated with center and headed south. The weather was reported to be no better in St. George, and it had the added fun of having only a 5,000-foot, gravel runway. I called district and informed them of the situation and the weather. They responded that the fellow in question had a bleeding ulcer and could die if we didn't get in there and deliver him to the docs in Anchorage. "Aye, aye," said I, and we pressed on.

We had had no intention of going to St George that day, so of course, we didn't have NOTAMs. But, the Herc is chock-full of radios, and we got on the horn to FSS and got the information. Nothing big, except "runway construction, and the last 75 feet of runway 11 was unusable." Focus on that word "last."

No big deal, I thought. The runway already is short, and I've landed many times on 4,500 footers, so I'll just put it down past the unusable part—piece of cake. Keep in mind, we are on about flight hour No. 4, have diverted once, shot four missed approaches, and almost had done something stupid while VFR.

ABOUT 10 MILES NORTH OF THE ISLAND, we saw a beautiful sight: no clouds. A gigantic clear area had blown in from the south, and the entire island was visible and beautiful. Heck, we even could see the lights of the ambulance sitting at the airport, waiting for us to arrive. A large sigh of relief was heard on the flight deck, and we completed the landing checklists.

"Just to be sure there's no junk on the runway, let's do low pass and visually inspect it before we land," I said.

Everyone happily agreed, and we descended for a look. As we flew over the runway, we noted construction equipment well to the side, a newly paved runway (a bonus), a temporary centerline, and a big X at the approach end of runway 11. Just like FSS told us, right? Wrong!

I wasn't convinced we'd seen everything, so I made a lap in the pattern and took one more look. Remember, we had five people on the flight deck of our Coast Guard C-130: two pilots, a flight engineer, a navigator, and a radio operator. We also had two load-drop masters in the back, with big scanner windows to peer down at the world below. No less than six sets of eyes looked at that runway—twice. We decided we were good to land. We even talked to the foreman of the construction crew, and he said everything was just ducky.

We again completed the before-landing checklist, just to be sure, and I pointed the nose at terra firma, with the intention of landing. Aimpoint, airspeed, centerline, aimpoint, airspeed, and centerline. We were right where we wanted to be and had everything under control.

I crossed the threshold, pulled back on the yoke, moved the throttles toward flight idle, and was in the groove when the most terrifying words I've ever heard loudly pounded my eardrums. The engineer screamed, "Holy $#!+, those are sandbags, go around!"

The "temporary centerline" certainly was temporary. Actually it was no centerline at all. It was temporary edge lighting, and it consisted of 20-pound sandbags, holding down white edge lights that stuck up a good two feet. For those of you not familiar with the performance capabilities of the C-130, I have one word for you: torque. Torque is a major factor in the Herc, and it's something that has to be closely managed, especially in cold weather. The brilliant minds at Rolls Royce, who designed the T-56 engine, did a great job. The dash-15 motors that power the Herc and the P-3 Orion produce around 4,300 horsepower each and generate monstrous amounts of torque. With this info in mind, you can imagine what a rapid, rather almost instantaneous, full-throttle application of power to the Herc's engines will do. Let me assure you that at an aircraft weight of 110,000 pounds, 100-percent flaps, plus 10 degrees Celsius, and 23,500-plus, inch-pounds of torque (the limit is 19,600 pounds), will make the C-130 climb like an express elevator attached to a shuttle-booster rocket.

We discovered the "last" 75 feet of runway actually meant the south 75 feet of runway, so the usable runway only was 75 feet wide. Also, the NOTAM didn't mention anything about temporary lighting. Also consider that no one had thought to ask about the load-bearing strength of the new pavement. Again, we flew over this runway two times before we came in to land. At least six sets of trained eyes looked at it and said, "Good to go."

Crew-resource management saved and failed us that day. I can't say for certain what the outcome of landing on top of those bags would have been, but it couldn't have been anything less than ugly. I easily can imagine departing the runway.

We talked to the ambulance crew on deck. They said the guy wasn't nearly as bad as district had said, and he'd had this problem for about a week. I then made the executive decision to pack up this circus and head home. We were one blink away from doing something stupid, or deadly. We had become more of a problem than a solution. I barely remember the two-and-a-half-hour transit home.

I do recall feeling anxious about shooting another approach to mins back in Kodiak. But, as we got closer and got a weather update, we found, to our relief, that the ceilings were way up, and the wind was down. We made a noneventful approach and landing. I headed to the quicky-mart, with credit card in hand, to purchase the copious amounts of Ben Franklin's favorite beverage I owed for the overtorques and outstanding engineer call. What a day!

The day ended with seven hours of flight time, five approaches, four overtorques, one landing, a pile of inspections, beers bought, humble pie swallowed, and 13 people walking off an airplane mumbling

We took a few lessons from this flight. Keep your head in the game. Don't let external nonsense, like talking about a crash, cloud your mind when you're making a challenging approach.

The minute the mission changes in flight is the minute you need to sit back and carefully evaluate everything that's going on.

Crew-resource management needs to be taken seriously at all stages of the game. CRM saved us twice, but lack thereof also almost got us into serious problems.

Everyone has a voice. A guy not at the controls made a great call and saved the aircraft from damage and possible destruction.

Make sure you understand what is being said in the NOTAM and how it affects your ability to operate.

The day ended with seven hours of flight time, five approaches, four overtorques, one landing, a pile of inspections, beers bought, humble pie swallowed, and 13 people walking off an airplane mumbling, "I'll never again step foot on a plane in Alaska."

I don't think anyone on that crew ever will look at a NOTAM the same way, and I think the term "sandbag" will run icy claws down my back for the remainder of my days. We had one heck of an adventure on a lazy Sunday in Alaska, especially with the second-in-command of my service's STAN team listening to the whole thing.

Lt. Fulcher flew with Air Station Kodiak, Alaska.

Prowler, Go Long

By Cdr. Bruce W. Hay

Photo courtesy of VAQ-133 public affairs.

November 2002 was month four of eventually what became a 10-month deployment onboard USS *Abraham Lincoln* (CVN-72). After a couple weeks flying Operation Enduring Freedom missions over Afghanistan, the battle group had transited the Straits of Hormuz to support Operation Southern Watch. The rhetoric machine was turned up to 11, and the missions that had been exceedingly boring in past deployments had turned to almost daily prosecution of Iraqi air-defense targets below the 32nd parallel.

Meanwhile, back in Afghanistan, combat operations against Al Qaeda leadership continued. Momentum was building for the two theaters, and it quickly became apparent we didn't have enough EA-6Bs to go around. Prowler support was requested for a series of missions to support high-level, joint-counterinsurgency operations in the far northeast corner of Afghanistan. If you look on a chart, the Northern Arabian Gulf is a long way from that part of Afghanistan. Our strike-group commander argued we were needed to support the rest of the strike group and the operations in Iraq. After a game of rock, paper and rank with CentCom, it was decided one Prowler could be sent to support the Afghan missions.

Such short notice left no time to arrange diplomatic clearance, which limited the options for ending the airborne portion of the mission. The distance and time involved meant we couldn't return to the boat. That left landing at Bagram Air Base, located 4,900 feet above sea level, as the plan. However, we'd be landing at night, and the only way to land would be on night-vision devices (NVDs). As the first West Coast Prowler squadron to get NVDs, we were fully qualified to use them. However, the subject of aided landings never had been part of our training, or even addressed.

My crew was selected, and the preparations began in earnest. We collected charts and anything we could get our hands on. We found an instrument approach that was a cross between a TACAN and a precision-approach-radar (PAR) approach.

We spent most of our time figuring out how to shoot an NVD approach and landing. How would we configure the lights? Do both aircrew in the front seat wear NVDs? What about the back-seater? This situation was one of the first times I remember doing deliberate, operational-risk management (ORM) for a flight. We decided our configuration would be midnight for the external lights, both front-seaters on NVDs, and the backs-seaters unaided (not on NVDs).

The flight was uneventful, and we had a dedicated tanker. The mission was familiar because we had operated there just a few months earlier. After six hours en route, it was time to land. We started the checklists and commenced the approach with the Bagram controllers. It became progressively obvious the controllers were not used to providing radar services, and we got ever further behind a salvageable approach. We soon found ourselves too high and too fast to land in the dark on the 9,852-foot, sectional-concrete runway, built by the former Soviet Union nearly 20 years earlier. So, despite the threat of manpads (man-portable air-defense systems), small-arms fire, and the surrounding terrain, we waved off the approach.

As I mentioned, we had an approach plate. Had anyone bothered to look at it, we might have landed on our first try. The approach plate clearly delineated speed and altitude gates, just like plates published stateside. In all of our planning efforts, we focused on the new and unusual aspects of the flight but neglected to spend much, if any, time on the approach itself. How many times were we taught in flight school to aviate, navigate, and communicate? We had blown it and ended up trolling for manpads in shame. The next attempt was successful, and we didn't draw fire.

By far, the most important thing relearned was that you easily can kill yourself in any phase of flight, inside or outside of a hostile area. We focused, rightly, on the new and unknown aspects of the mission, but we neglected to spend the appropriate time on the last and most critical part of the mission.

Cdr. Hay is the commanding officer of VAQ-139.

No Squawking, No Talking

By Lt. Chad Norris

I had flown E-6s in my previous tour and was used to dealing with poor cockpit visibility. So, when I discussed "VFR scan and lookout doctrine" during briefs, I often shared a story about when I almost ran over a lineman who was underneath the nose of our mammoth Boeing 707 when I started to taxi. Now that I'm a T-6A flight instructor, I was confident I could draw on my "scan and lookout" experience to handle any distractions from a student.

It was a bad-weather day, and a number of new instructor pilots (IPs) and I were hanging out in the ready room. We were discussing the issue of reduced visibility and blind spots caused by the students' white helmets in the front seat. As the squadron's T-6 standardization officer and a seasoned instructor, I was asked what situations I thought were unsafe. When it came to this issue, I usually defaulted to senior reserve IPs. Many of the old-timers, who also instructed in the T-34, thought it was a non-issue because of the improved visibility of the T-6 versus the T-34. I never had had any problems with restricted visibility, so I tended to agree with them. My opinion would change a few weeks later on a VFR day over southern Alabama.

The day was so beautiful I couldn't believe I got paid to be a flight instructor. After completing a nearly flawless MOA profile, my student and I made our way to Monroeville County Airport, a small and uncontrolled airport, to work on landing patterns. We just had completed our third touch-and-go, and with the entire airport to ourselves, my German lieutenant student got better with every pass. Sunset was nearing, and the visibility was lowering, so I told my student to make the next pattern a full stop.

On short final, the student completed the before-landing checklist and called the runway clear. As he touched, I heard a loud voice announce, "Sir, there's an airplane on the side of the runway!"

As I took the controls to execute a go-around, I saw a Cessna 172 fill the screen of my canopy and run down the left side of the airplane. We were within 50 feet of each other—the closest I ever had come to cheating death. On our climb-out, I tried to maintain my composure. My attempts to contact the pilot came up empty. While on downwind, I watched the Cessna pull back onto the runway from about midfield and taxi in the opposite direction to a hangar at the end of the runway. The pilot never squawked or talked to anyone.

I learned the Cessna had a student pilot, who had entered the airfield to land in the opposite direction to us. He had the wrong frequency in his radio, no transponder, and no navigation and anti-collision lights. The mind-blowing part was that he did nothing legally wrong, other then not having his lights on. The airport was an uncontrolled field, and the principles of "see and avoid" were all that applied. As far as the FAA was concerned, he did just what he legally was required to do.

No doubt about it, I was complacent that flight and had not vigilantly cleared the runway on our final landing. What saved our lives? The key was crew coordination. I always briefed the students to call the runway clear on short final. My poor visibility and/or the student's lack

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Many of the old-timers, who also instructed in the T-34, thought it was a non-issue because of the improved visibility of the T-6 versus the T-34.

of flight experience were a hazard that easily could have been mitigated by making this "runway clear" call.

I now have a better perspective of my limitations and a healthier respect for the restricted visibility. I make it a priority to emphasize crew coordination and lookout doctrine during every brief I give.

Runway incursion was one of those things I thought only happened to commercial airliners and only was discussed every year during instrument-ground school.

Lt. Norris is a T-6 instructor pilot at VT-4.

An article in the Approach *Nov-Dec 2007 issue, What's a Bug Smasher Doing in My MOA, by LtCol. Ed Linch, USAF, discusses shared airspace in military and civilian aviation, and also the See and Avoid program. View the article at:*

http://safetycenter.navy.mil/media/approach/issues/nov-dec07/pdf/Whats_a_Bug_Smasher_Doing_in_My_MOA.pdf

INSTRUMENTS TELL A STORY

By Lt. Ross Comer, USCG

We enjoyed another beautiful Southern California afternoon in September. Our HH-60J crew was flying down the shoreline on a homeland-security patrol, after an afternoon of waving the flag along the beaches of San Clemente and La Jolla. We were late getting back to San Diego, having made a precautionary landing hours earlier for a false fire light.

When the first engine symptom appeared, we were in a 30-degree, angle-of-bank left turn. The pilot at the controls (PAC) was pulling in power to recover from a high-rate descent, which was required for the Mission Bay approach into the landing pad at sector San Diego. We heard a distinctive boom from the left engine compartment, coupled with a nearly simultaneous uncommanded aircraft yaw. A glance at the pilot-display unit (PDU) revealed the Np on the No. 1 engine was not registering; the No. 2 Np and Nr were rocketing into the yellow and red chicklets.

The PAC quickly leveled the aircraft to diagnose the problem, and then banked right toward NAS North Island. Our emergency procedure (EP) for an engine-power loss begins with managing rotor rpm, bringing on contingency power, and adjusting the airspeed for single-engine flight. With the Nr still inching up, maintaining these items kept the aircraft commander (AC) working hard to maintain the aircraft within limits.

The loud bang out of the left engine compartment, the loss of power to the No. 1 engine, and the yaw indicated that the high-speed shaft in the No. 1 engine had failed. Those symptoms are textbook indications of a failed drive shaft. This initial diagnosis would be the focus of our efforts during our handling of what we thought was a single malfunction.

As we turned toward the airfield and tried to keep Nr under control, the aircraft shook violently. I thought the engine may have thrown shrapnel into the transmission or elsewhere, wreaking havoc on our helicopter. Not knowing the condition of the helicopter or the likelihood of our making the airfield landing, I broadcast maydays on all available frequencies to clear the area.

We navigated to the nearest taxiway and were established in an approach profile. The Nr and No. 2 Np skyrocketed again as we approached the field, and the AC reduced power for landing. Meanwhile, the aircraft shook the teeth out of our heads. At 200 feet AGL, the AC called for both power-control levers (PCLs) to be moved to "OFF." I waited until we reached 100 feet and did just that. After positioning the PCLs, we became the first Coast Guard H-60 crew to enter a self-induced autorotation—a dubious honor.

We landed with plenty of Nr and airspeed—actually, too much airspeed. We burned out the brakes stopping the aircraft before crossing the runway. The

generators kicked off-line well after our landing, which indicated we still had at least 97 percent Nr when we landed. All in all, the AC flew an excellent approach, considering it was his first power-off approach.

The safety investigation revealed our analysis of the events was flawed. There actually had been two nearly simultaneous events that had led to our misdiagnosis. First, an environmental-control-system (ECS) duct in the left side of the aircraft suddenly had come loose, violently causing the initial bang and rumble in the left engine compartment. This problem closely was followed by a severe high-side failure in the No. 2 digital-engine-control unit (DECU), which caused the aircraft yaw and the low indications on the No. 1 engine. We believed this engine was spewing parts and destroying the helo, and functioned normally in response to a malfunctioning No. 2 engine.

The procedures we had followed during the emergency were unorthodox at best. The appropriate procedure for a high-side failure is to bring back the malfunctioning engine PCL and manually set it to a level below the functioning engine. This action results in a nearly normal profile for an approach. Instead of a difficult and unforgiving power-off profile, we might have proceeded with a fairly benign approach.

The AC of our helicopter already had experienced and successfully diagnosed a high-side failure earlier in his career. He was a confident pilot with a lot of time under his belt. I was a fairly new copilot, but it wasn't my first rodeo. The important concern is how both of us had misdiagnosed critical factors in this emergency and led ourselves down the road to a nonstandard and less-than-optimal response.

Our initial responses were correct. Heading to the nearest field and working to reduce Nr and set ourselves up for a single-engine approach into the taxiway were appropriate responses. Clearing the area and notifying home base also were important steps we took quickly.

However, we made several serious errors. Our crew misdiagnosed a serious compound-emergency, and took drastic measures to handle an emergency which, in hindsight, appears significantly less urgent than our estimations.

The first lesson learned is to let the instruments tell a story, especially when you feel your hair stand on end. You have a strong pull toward action and reaction during an emergency. Take the time to perform a full scan of the instrument panel. Only three emergencies require immediate action or "fast hands" in the H-60: dual-engine failure, tail-rotor-drive failure, and engine-compartment fires. If those indications aren't present, you have time to analyze and perform a full instrument scan.

In our case, both pilots were fixated on maintaining Nr and finding the closest place to land. Neither of us took time to look at the instrument panel and engine parameters; we would have noticed the ENG OUT light was not illuminated. Although the Np of the normal functioning engine was not indicating, the torque and TGT still indicated an operational engine. The engine was turning but wasn't producing any power.

We were convinced the engine was destroying itself and spewing metal into the rest of the helicopter. This idea corrupted my response to the emergency, the focus of my scan, and my judgment concerning the movement of the PCLs on short final.

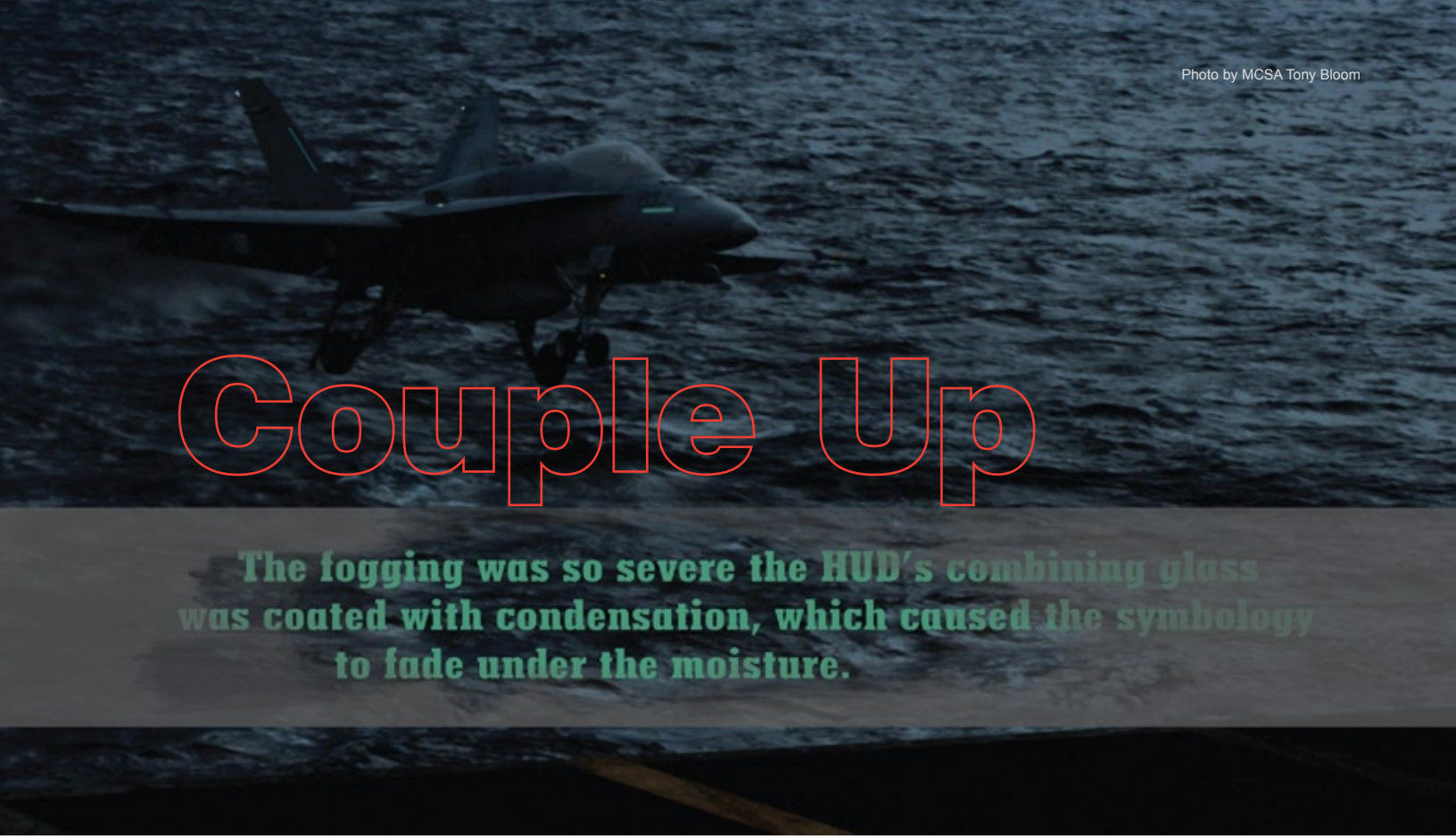
IT'S HARD TO EXPLAIN WHY TWO PILOTS missed the engine indications. Human-factors experts call it the "strength of an idea, or confirmation bias." The combination of the sound of the ECS duct and the immediate response in the helicopter established the idea in our minds.

I also learned the physical effects of an emergency, especially a compound malfunction, will create false indications. The simulator is an important tool, but it cannot recreate the physical realities of a serious malfunction.

The physical indications of the emergency confirmed our diagnosis. The flight manual never mentioned dental fillings coming loose during a high-side failure. What I thought was the rotor system chewing itself to pieces actually was the combined effects of the ECS duct flogging itself to death and the effects of very high Nr on the balance of the rotor system. The helicopter is balanced for flight at 100 percent Nr. When the rotor system is flying with power at 115 percent Nr, the balance is off, and intense vibrations are the result. Helicopters are dynamic machines with hundreds of fast moving, delicately balanced parts. If any piece is out of balance or malfunctioning, the result can be dramatic. Also, vibrations, leaks and other physical indications can have many different sources, and the crew unlikely will pinpoint a source without checking the instrumentation inside.

The AC and I were focused on bringing our aircraft into the airfield, as we should have been. However, we failed to use our flight mechanic. The flight mechanic can serve as a quality control for the pilots and could have brought a fresh pair of eyes to the situation while we fixated on the incorrect diagnosis. Don't forget the value of crew-resource management (CRM).

Lt. Comer currently flies with USCG Air Station, Clearwater, Fla.



Couple Up

The fogging was so severe the HUD's combining glass was coated with condensation, which caused the symbology to fade under the moisture.

By LCdr. Chad A. Gerber

The Hornet often is described as so advanced the only limiting factor is the pilot at the controls. The aircraft has all the bells and whistles expected of a modern fighter, with the operational simplicity suitable for a single-seat aviator. On a late-night recovery onboard USS *Ronald Reagan* (CVN-76), a system rarely exercised to the fullest extent of its capability saved not only the aircraft, but quite possibly the pilot.

The ship had wrapped exercises near Hawaii a week earlier and just had moved into the Guam operating area to conduct large-force-strike training. The ship was about 150 miles from the nearest landing field, operating under a "blue water" mindset. The transition from the cool, dry air of Southern California to the warm, wet air of the tropics finally was about to get the best of me. That night, I would learn what it's like to land aboard the carrier with my eyes closed—not where you want to be.

I was the overall strike lead for the night's air-wing strike of 28 fixed-wing aircraft. The launch and mission execution went exactly as briefed, or so I'd like to think. The flight-deck handler had worked out an excellent recovery plan, which allowed an "open deck." As soon as the launch was complete, the deck would be made ready to recover aircraft. The preflight brief called for all aircraft to recover as soon as their tasking was complete.

The overall success of my mission could be measured in the management of fuel and ultimate recovery of all aircraft. First to recover were the mission tankers and the suppression-of-enemy-air-defenses (SEAD) package, followed by the red air and fighters. As a striker, I would be one of the last aircraft to recover. The carrier-air-traffic-control center (CATCC) did a super job cycling the initial 10 to 15 aircraft down through the marshal stack. However, by the time I was to come aboard, the approaches had degraded to vectors.

"Sting 301, marshal. Vectors for recovery. Turn right to 330 degrees, descend to angels 1.2; you are following a Rhino in the hook at six miles."

Just moments before this call from marshal, the flight had knocked-it-off and fenced out. With my standard penetration checks complete, I was ready to come aboard. From out of 24,000 feet, I went for the assigned 1,200 feet. Without giving the icy-cold-cockpit condi-

tions a second thought, I descended with the throttles at idle, speedbrake deployed, and about 15 degrees nose-down. The aggressive descent profile took just a couple minutes to arrive at angels 1.2. The throttles came up from idle to maintain level flight, and the aircraft's environmental-control system began to work overtime in the warm, thick, moist air near sea level.

With more than 1,000 hours in aircraft type, I honestly can say I've never manipulated the cockpit defog handle from any position other than vertical/straight up. Also, I cannot recall ever preheating the cockpit before penetrating an approach. Most other Hornet pilots today will tell you the same thing. The typical Case 3 recovery consists of a series of level offs (holding overhead, marshal stack, and CV-1 approach), enabling the environmental-control system (ECS) to compensate for changes in outside-air temperature and humidity. The ECS works as advertised 99.9 percent of the time. Unfortunately, this article is based on the other 0.1 percent.

MY HORNET TRAINING HAS TAUGHT ME to complete HAIL checks before penetrating an approach. The first letter in this mnemonic, H, stands for both hook and heat. Remembering to put down your hook is the easy part. Preheating the cockpit and throwing your defog handle forward is less intuitive because of past ECS performance. If you've penetrated 500 times before without having to make an adjustment, why would you start now? I was comfortable acknowledging the "H" check as complete, because my habit patterns never had failed me.

Once I was level at 1,200 feet, the vectors brought me nicely to a 10-mile final. Despite the roar of the airflow through the ECS ducting and visible moisture in the cockpit, the "fog creep" on the canopy was insidious because of the night's black backdrop. At about eight miles, I caught myself leaning forward in the seat to get a better look at the heads-up display (HUD), my primary attitude instrument. The fogging was so severe the HUD's combining glass was coated with condensation, which caused the symbology to fade under the moisture.

The consoles were soaking wet and water was running down the displays. There was so much moisture it practically was raining in the cockpit. Now at six miles and fully aware of the problem, I moved the canopy-defog handle to full forward—a step that was too little too late. The moisture had soaked everything, including me. I continued the approach, and tipped over at three miles from 1,200 feet as expected, hoping for a silhouette of the carrier. With fingers crossed, and after almost five minutes of troubleshooting, I hoped isolated sections of the forward windscreen would be clear. Unfortunately, on what should have been a standard night recovery, the radar altimeter went off as I passed 500 feet, one mile aft of the ship. I still was CLARA ship.

"Approach, 301 is gonna take it around for IFR in the cockpit," I called.

Left to the downwind, I turned to a heading of 270 degrees. My wingman, who now was on deck, broke out the NATOPS pocket checklist to back me up. Nothing seemed to work. The air coming out of the ECS vents was extremely warm and very moist—exactly what I did not want to feel. Selecting "MAN" on the ECS panel seemed to have no effect on the temperature. I even selected "RAM/DUMP" for a nanosecond, in hopes the outside air was drier than what I had in the cockpit. As you might imagine, this action only exacerbated the situation.

I was in a pickle. My fuel state meant I had one pass left before I'd have to tank from the Rhino overhead. Tank? It then dawned on me that if I couldn't see a 1,000-foot-long aircraft carrier lit up like a Christmas tree, I certainly couldn't in-flight refuel. Divert? Not only did I not have the gas to get to an isolated island airfield, but there was no guarantee my perceived ECS problems would subside by then. Carrier recovery? I had tried to land once already. ACLS Mode I? Well, despite my reservations, I was left with no other viable option.

"Approach, 301, request Mode I," I called.

Thus, Sting 301 handed over pitch and roll control to the ship's automatic-carrier-landing system (ACLS). The Mode I, as it is called, is a capability that every Hornet pilot understands but rarely exercises. Many carrier aviators would be happy to go their entire career without ever coupling up to ACLS. My predicament is a shining example of why we, as a community, should practice Mode I approaches.

On this dark night, everything worked 4.0. My fuel state was 3.3, I had no ability to in-flight refuel, and the nearest divert was more than 150 miles away. I made the decision to land in my self-induced IFR aircraft "coupled up for safety." The ride down was smooth as glass, and I grabbed the 2-wire without ever seeing the ship. The sight of "76" off my right shoulder never looked so good.

LCdr. Gerber flies with VFA-113.

Multiple Fail

By Lt. Nick Skirvin

The crew of Bear 601 was two months into deployment and two weeks into Operation Enduring Freedom (OEF) missions. We were preparing for what we thought would be another routine flight. The man-up was a hot-pump, crew switch that started OK, but radio issues necessitated a last-minute swap to the spare plane.

After an expeditious man-up and start of the spare, we taxied to Cat 1. As I watched the airspeed indicator climb past 130 knots, I felt the familiar thump of reaching the end of the cat and the words, "Good shot" over ICS.

During climb-out, we were surprised with an oxygen-system failure. We had an oxygen light on the advisory panel and an associated zero liters on the O2 gauge. As an aircraft without OBOGS, this situation is a no-go. We called for a rep on button 18 and advised them of our status. The rep was sympathetic to our plight but asked if we simply had no indications of oxygen, or if we actually had tried to use oxygen and it didn't work. The crew verified the system was functioning by taking a few breaths from the O2 mask. I broke out the PCL, ran through the checklist, and ended up at "Land as soon as practical." The boat was the closest suitable place to land, so our crew briefly talked about the situation and advised the rep that we would bring it aboard. Still feeling the pressure to accomplish an OEF mission, we were told we would trap, get checked out, and launch with the next cycle.

Fair enough.

As we turned to marshal, the crew noticed the starboard motor made an audible change, accompanied by a decrease in rpm below 50 percent. With the motor winding down, we told the ship we needed an immediate recovery.

As we turned to marshal, the crew noticed the starboard motor made an

We completed the engine-failure emergency procedure, only to find our night getting more interesting. We received indications of stuck rudders at six degrees, when what we really needed was 20 degrees. We started the stuck-rudder EP, and while working our way into the pattern for recovery, our back-end tried to relay this new situation to the rep. At the same time, the

Photo by MCS3 Jonathan Snyder

front-end was talking with marshal, trying to declare an emergency. With all the chatter on marshal while they worked with the rest of the regularly scheduled recovery, no one was clear we were an emergency aircraft. No one, that is, except a Hornet pilot who spoke up as he was called by marshal, "Marshal, 301… 601 is an emergency aircraft!"

We hadn't completed the stuck-rudder EP when the problem fixed itself, and we simply were an aircraft landing at the boat on a single engine. We made an uneventful 3-wire.

When we thought about what had happened, we actually had a hierarchy of emergencies. The most serious issue was the stuck rudder, a situation that inhibits controllability of the aircraft. Next on the hierarchy was our single-engine capability. The Hawkeye will fly fine on single-engine, and you will retain bolter, wave-off, and climb-out abilities. The third issue we had was the low-oxygen level, which, in this case, was minor.

While oxygen is the most minor of the actual emergencies, I feel it deserves the most attention. As aviators, we know our EPs and can blurt out the boldface items in our sleep. We practice these things throughout the year with NATOPS stan checks, simulator events, and ready-room discussions. One thing we don't focus on, however, is what to do when someone tells you to do one thing, and you're sure you should do another. Any aviator will tell you to do what is right and what falls within your comfort zone. But, what will you really do when a senior aviator is your rep, and he lays a little pressure on you to accomplish the mission? Do you take a couple pulls on the mask, determine the oxygen system is fine, and press with the mission, making a mental note to gripe it when you land? Or, do you break out the checklist for a seemingly minor EP, determine it is most prudent to land, get checked out, and tell rep that you are not going on this combat mission with this plane?

audible change, accompanied by a decrease in rpm below 50 percent.

We made a decision as a crew to bring the plane aboard. The other emergencies that occurred in the ensuing minutes before we trapped merely were incidental.

Lt. Skirvin flies with VAW-124.

BRAVO Zulu

ENS. BRANDON OSWALD AND A VT-2 INSTRUCTOR PILOT (IP) were returning to NAS Whiting Field after a weekend, instrument, cross-country training event. These flights are in the primary phase of T-34C flight training. The crew was completing the last training sortie with a PAR approach to a full stop at South Whiting Field, which would require a long taxi back to North Whiting Field. The south field primarily serves as the advanced training site for rotary-wing training but is used for weekend and night recoveries for Turbo Mentor training missions.

Issues related to operating out of South Whiting Field are lack of well-defined taxi lines and limited airfield lighting. The T-34 also has issues, including limited visibility related to the cockpit and interior-lighting design. The crew also is hampered by the relative condition of the canopies of the aged airframe. These issues have been long identified as hazards to T-34 night operations at the south field and have been mitigated in part by thorough briefings for night recoveries.

Ens. Oswald shot the PAR approach down to about 200 feet AGL, when the IP took the controls and landed. The IP then slowed the aircraft to a safe taxi speed and was directed to contact South Whiting Field ground and taxi clear of the duty runway. The IP relayed the UHF ground frequency to Ens. Oswald (in the front cockpit) and told him to enter the frequency into the UHF radio. Ens. Oswald momentarily looked down into the cockpit to change the frequency. He then shifted his scan outside to make sure the aircraft was clear of any hazards.

As the instructor began to turn from the active runway onto what appeared to be the off-duty runway, Ens. Oswald determined they were about to taxi onto the grass just short of the off-duty runway.

He called, "Stop!" over the ICS, and immediately took the controls and stopped the aircraft, using full braking. The IP then took back the controls, corrected the aircraft's position, and continued to taxi to North Whiting Field. Ens. Oswald's keen situational awareness and quick corrective action prevented an unsafe situation from developing into a possible mishap.

LCDR. ROB SCHNEIDER (AC-NFP), LCDR. JAMES HAAS (PAC), AND AW2 MONIQUE BOZEMAN (TAC), were a UC-12M flight crew on a joint-operational-support-airlift-center (JOSAC) mission. For the second leg of the personnel-logistics flight, the crew picked up four passengers and then taxied at near-normal, max-gross takeoff weight.

On climb-out from Langley Field, they flew into instrument meteorological conditions through 400-feet AGL. As they passed through 2,500 feet, still in IMC, the crew felt a heavy shudder, followed by airframe vibrations. LCdr. Schneider looked out the right side, saw flames and sparks streaming down the cowling from the exhaust stacks, and called it to LCdr. Haas' attention. The aircraft then shuddered twice as the right engine had two rapid compressor stalls. LCdr. Schneider immediately responded with the memory items of the emergency-engine-shutdown checklist, asking for dual concurrence as the condition lever was secured. The

LCdr. Rob Schneider, LCdr. James Haas, and AW2 Monique Bozeman.

propeller lever was moved into the feather position.

LCdr. Haas already had responded by leveling the aircraft and trimming it into a single-engine configuration. LCdr. Schneider contacted approach control, declared an emergency, and requested vectors for a PAR to the active runway at nearby Chambers Field. AW2 Bozeman calmly briefed the passengers as they prepared for an emergency landing.

After receiving the first vector for a downwind to runway 10, LCdr. Schneider broke out the emergency checklist to verify and complete the remaining items on the emergency-engine-shutdown checklist. LCdr. Haas flew the aircraft, on profile, in IMC.

The final controller called an accurate PAR approach. LCdr. Haas descended to 350 feet before breaking out and landing single-engine with a strong crosswind. He then made a single-engine-reversing maneuver to stop the aircraft and taxi free of the duty runway.

The investigation of the engine revealed a large hole in the right exhaust stack, several protruding dimples in the left stack, a bent exhaust-exit tube for the inlet anti-ice, and chipped paint behind the stack on the upper surface of the wing. These findings indicate a rare PT-6A uncontained catastrophic failure of the engine by parts exiting the stack. Once the engine was removed, no indication of FOD damage to the inlet or compressor was noted, so a failure of the burner section or power turbine is suspected.

Maj. Chad Casey and Capt Kevin Hughes.

THREE HARRIERS LAUNCHED from an LHD for training during a bi-lateral exercise in the Gulf. Two aircraft were flown as a section, with the planned mission of strike coordination and reconnaissance (SCAR). Maj. Chad Casey, USMC, flew the lead aircraft, with Capt. Kevin Hughes, USMC, as Dash 2. The third aircraft was flown as a separate element in support of the SCAR section. Capt. Hughes' aircraft was loaded with Mk-76 practice bombs and 25mm target-practice ammunition.

During the mission, he flew three attack runs. As he made the off-target maneuver from the final attack, Maj. Casey saw a stream of vapor coming from Capt. Hughes' aircraft and moved closer for a visual inspection. Maj. Casey soon realized the vapor was fuel streaming from puncture holes on the upper fuselage, just aft of the wing. He also saw damage to the vertical stabilizer.

Standard procedure for airborne damage is to conduct a controllability check and then make a rolling landing to the closest suitable airfield (versus a vertical landing aboard ship). However, streaming fuel dictates an immediate landing to the nearest suitable surface to preclude fuel starvation. The ship was located 50 miles closer to the flight than the nearest divert field. The crews found themselves faced with conflicting emergencies and little time to decide on their course of action. Both aircrew instinctively knew they needed to get the damaged aircraft on deck as quickly as possible.

With his wingman's fuel state decreasing rapidly, Maj. Casey directed the flight toward the ship, passing Capt. Hughes the lead so he could focus on flying. To reduce his section's task loading, Maj. Casey passed responsibility for communications with ATC and the ship to the third Harrier pilot. He then backed up Capt. Hughes as he did the procedures for a slow-flight controllability check. At eight miles from the ship, Capt. Hughes only had 600 pounds of usable fuel remaining. With his flight lead in trail for mutual support, Capt. Hughes made a visual straight-in approach to a vertical landing.

Visual inspection revealed the left side leading-edge-root extension (LERX) had come off the aircraft, hitting multiple points along the top of the wing, fuselage and tail. The aircraft only had a few minutes of usable fuel remaining after landing. One of the LERX mounting brackets had failed from a fatigue crack (that had formed over time) during the pilot's off-target maneuver.

Photo by PH2 Daniel R. Mennuto

Controlling CFIT

NAVAIR's CAS Team Working on Collision-Avoidance Systems

"CFIT has been one of the leading causes of mishaps in recent years and continues to be one of the most difficult problems to solve."—Maj. Matt Robinson, USMC, aviation investigator, Naval Safety Center.

The collision-avoidance-systems (CAS) team at Naval Air Systems Command (NAVAIR) has been developing and integrating controlled-flight-into-terrain (CFIT) systems in Navy aircraft since 1991. This team is part of NAVAIR's Air Combat Electronics Program Management Activity (PMA209), stationed at Naval Air Station Patuxent River, Md.

Two systems the team is working on are the ground-proximity-warning system (GPWS) and terrain-awareness-warning system (TAWS). They are government-developed, owned, and patented embedded-software, CFIT-protection systems for tactical aircraft. The CAS team supports fixed and rotary-wing platforms and is responsible for developing, integrating, installing and providing life-cycle support of GPWS and TAWS capability.

These systems have several documented saves, including ones documented in Iraq, and have helped reduce the CFIT rate. One H-53 squadron XO, while talking about GPWS, said, "There are pilots and crew members alive today because of this system." The GPWS team won the Federal Aviation Administration 2006 Excellence in Aviation Research Award for enhancing the safety of military aircraft.

Currently, all AV-8B and FA-18 aircraft have GPWS and TAWS installed. As Navy and Marine Corps aircraft become an all-digital fleet, embedded GPWS and TAWS will be installed on a variety of platforms, including MH-60R, MH-60S, AH-1Z, UH-1Y, CH-53K, MV-22, T-45, and E-2D. The MH-60R and MH-60S are the first rotary-wing platforms to receive embedded GPWS; they are scheduled for deployment in 2011.

Feedback (good and bad) from fleet users of our CFIT products is critical to the development and maintenance of the COTS and embedded software GPWS and TAWS. We are committed to providing the best products and service to the fleet. Contact us at *PMA209GPWS@navy.mil*, or 301-757-6662. Ms. Susan Whitley is the CAS team leader.

Article provided by PMA209.

Editor's note—CFIT was the focus topic in the March-April 2009 Approach. *For more information on CFIT, including preventive measures for aircrew, read the issue's lead article,* Getting Control of CFIT, *by Maj. Matt Robinson, USMC, at: www.safetycenter.navy.mil/media/approach/issues/Mar-Apr09/Mar-Apr09_Approach.pdf*

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

Photo composite image.

The Only Critical Skill

By Lt. Paul Kepner

At the dinner table in the wardroom of USNS *Bridge* (T-AOE 10), a discussion switched from the usual analysis of movies and disappointing sports teams to the topic of child development. "Why is it," my colleagues from the air detachment and I wondered, "that some siblings can turn out so profoundly different from their brothers and sisters, when they grow up in the same household?"

We explored this question for a while, as if we were the first people ever to ponder "nature versus nurture." I told the group I believed that sometimes there are pivotal points in people's lives, and that those moments can influence a person's development far more than their nature.

I had been a proud member of HSC-21 for almost a year and was about to deploy on my nugget cruise on board USNS *Bridge* as part of Det. 1. The detachment had supported USS *Ronald Reagan* (CVN-76) strike group's CompTuEx from the beach earlier in the month, and we almost were finished with JTFEX.

April 18 was the last fly-day of JTFEX for our det and consisted of vertreps between NAS North Island (NASNI) and *Bridge*, and several pax runs from *Reagan*. The day had been long and nonstandard, which was beginning to become the standard. After dropping off the last passengers at the NASNI terminal, the HAC and I launched for the short trip back to *Bridge* to shut down for the day.

With about five miles to go, we checked in with tower with a see-you. Tower came back with a request from the captain to search in

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the vicinity of the ship for a lost jet skier. Apparently, the ship had been asked by the Coast Guard if they had seen anyone on a jet ski, and the captain wanted us to check a two-mile radius around the ship. This task piqued the interest of the crew but did not throw everyone into "rescue mode." After all, we were only asked to search the vicinity of the ship before landing. "Rescue mode" came into full effect about 15 minutes later when we saw a watercraft floating on the horizon, about five miles south of our position.

While our rescue swimmer and crew chief got themselves prepared in the back, the HAC flew us toward our potential survivor. I meanwhile went through the automatic-approach checklist. As we got closer, we could see our mystery watercraft was indeed a Sea-Doo, with the survivor still on board. He looked like Yosemite Sam in a wetsuit, only more sunburned. It immediately was clear why he had taken out his Sea-Doo that day when we saw the attached fish finder, fishing rod, and live-bait tank. What was not clear was exactly how long he had been exposed, and whether he needed rescue or just a steer back to San Diego. To find out, the crew chief had attached the rescue swimmer's radio to the rescue hook and prepared to lower it to the survivor. This gave the HAC and I immediate pause.

My HAC asked, "How is he going to know how to use the radio once he gets it?"

The crew chief answered, "We taped 'push to talk' next to the button, sir."

We still were skeptical but wanted more information before we proceeded with the rescue. We tested the handheld radio on 282.8, and it checked 4.0. The crew chief lowered it down. What we did not know up front was the radio was attached to the bright orange rescue strop. Any debate over whether or not to use the radio quickly became moot when our jet skier dove after the strop, forfeiting the purchase of his beautiful personal watercraft in the process. At this point, our problems compounded because the survivor was attempting to put himself into the strop while flailing in the rotor wash.

"He put himself into the strop… it looks like he did it right," said the crew chief. "Let's hoist him up."

"Negative, negative!" the HAC and I said in unison.

The only safe option was to deploy the swimmer from a "15 feet and 0," so he could disentangle the survivor and properly hoist him. I was in the right seat, so I took controls and brought us down for the hover. We then came up and engaged the coupler at 60 feet. The rest of the hoisting went without incident. The survivor came on board, and we departed the hover for the ship. We landed on *Bridge*, took fuel, and swapped out our second crewman, while the ship's medical officer assessed our survivor.

Our crew chief found out during the transit to the ship and the medevac flight to Scripps La Jolla Hospital that our survivor had set out at 0700 that morning, which put his exposure time at slightly more than nine hours. That amount of time in hot sun and 65-degree water had left him extremely dehydrated and moderately hypothermic. The radio he kept in his watercraft had been good just long enough to establish contact with the Coast Guard but not long enough to relay a position. He had run out of fuel on the windward side of the uninhabited Los Coronados Islands, five miles south of the Mexican border, leaving little likelihood he would have been seen by any other vessels before nightfall.

I had not been to Scripps on a hospital fam in about 13 months, and that had been on NVDs. The HAC hadn't been there since before his last deployment. With a little searching and a few red herrings, we found the pad, and the HAC made the landing. We delivered the patient, the crew chief gave a passdown of his vitals, and we headed back to *Bridge* just before sunset.

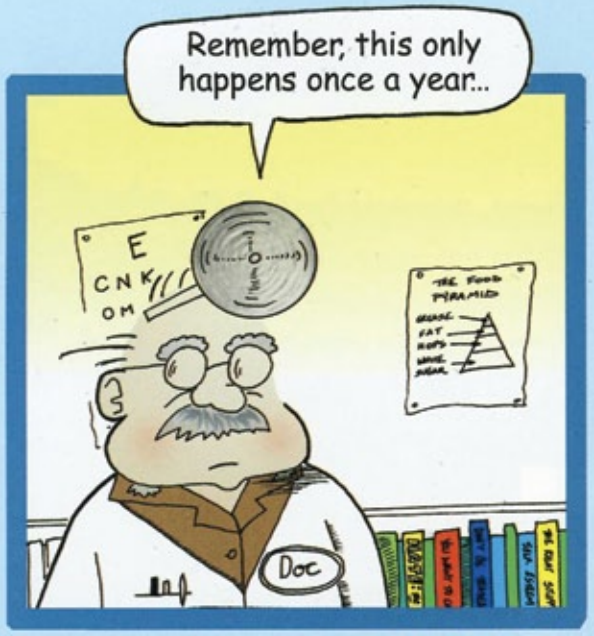
EVERY TIME A NAVAL AVIATOR FLIES, he takes his natural skill set with him, but he also refines and adds to that skill set as the events in the flight teach him. Some flights exert far more influence in a pilot's development than his given nature or his gradually acquired skills. That flight in April influenced me in that way. We all banter about the answer to the question, "What is the most important CRM skill?" To me, there is only one CRM skill, and all others help describe it: leadership. Without an effective leader on that flight, an excited crew, and a crew chief who thought he was error-immune might have snatched defeat from the jaws of victory. Our HAC kept us all from acting impulsively, but he did it without marginalizing anyone's efforts toward the goal.

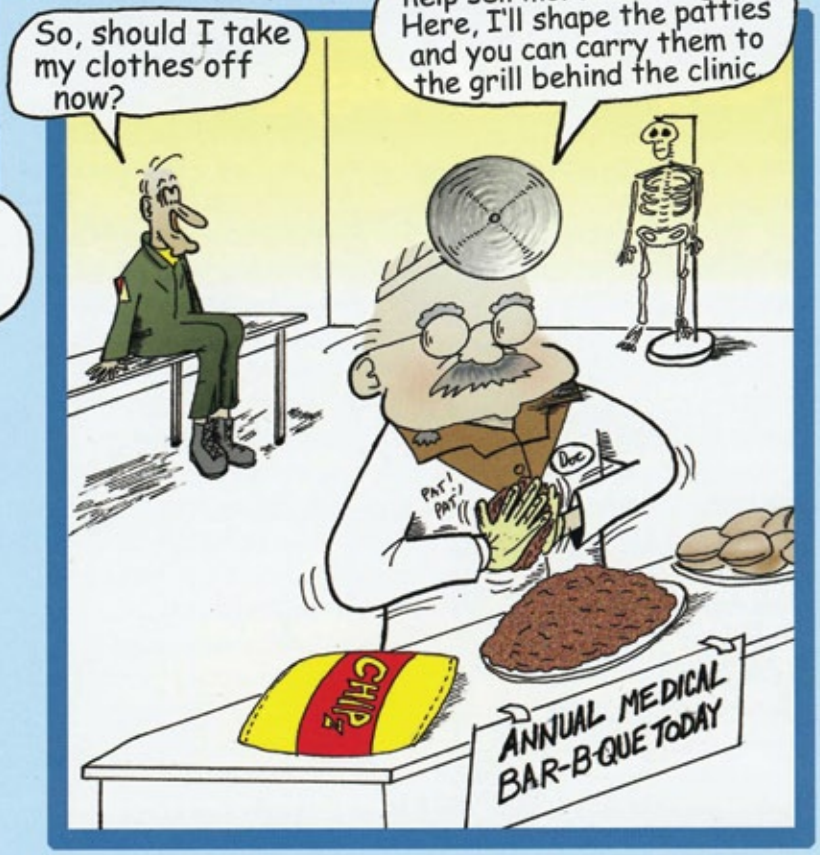
I call that flight a pivotal point in my flying career, because those lessons learned regularly aid me, even six months later, as I try to develop into an aircraft commander. I ask myself if I'm acting as a leader on the flight, or just sitting the farthest forward. Am I making choices, or are things simply happening to me? These questions matter. Flight school, the FRS, and almost a year in a fleet squadron somehow had not managed to get that message through to me. It took an afternoon in April and a lost jet-ski fisherman off Mexico to do that.

Lt. Kepner flies with HSC-21.

BROWNSHOES IN ACTION COMIX

"The kind real aviators like"
by Cdr. Ward Carroll





FATIGUE

is an expected and ubiquitous aspect of life.

For the average individual, fatigue presents a minor inconvenience, resolved with a nap or by stopping whatever activity that brought it on. Typically, there are no significant consequences. However, if that person is involved in safety-related activities such as operating a motor vehicle, piloting an aircraft, performing surgery, or running a nuclear reactor, the consequences of fatigue can be disastrous.

—FAA