THE NAVY & MARINE CORPS AVIATION SAFETY MAGAZINE

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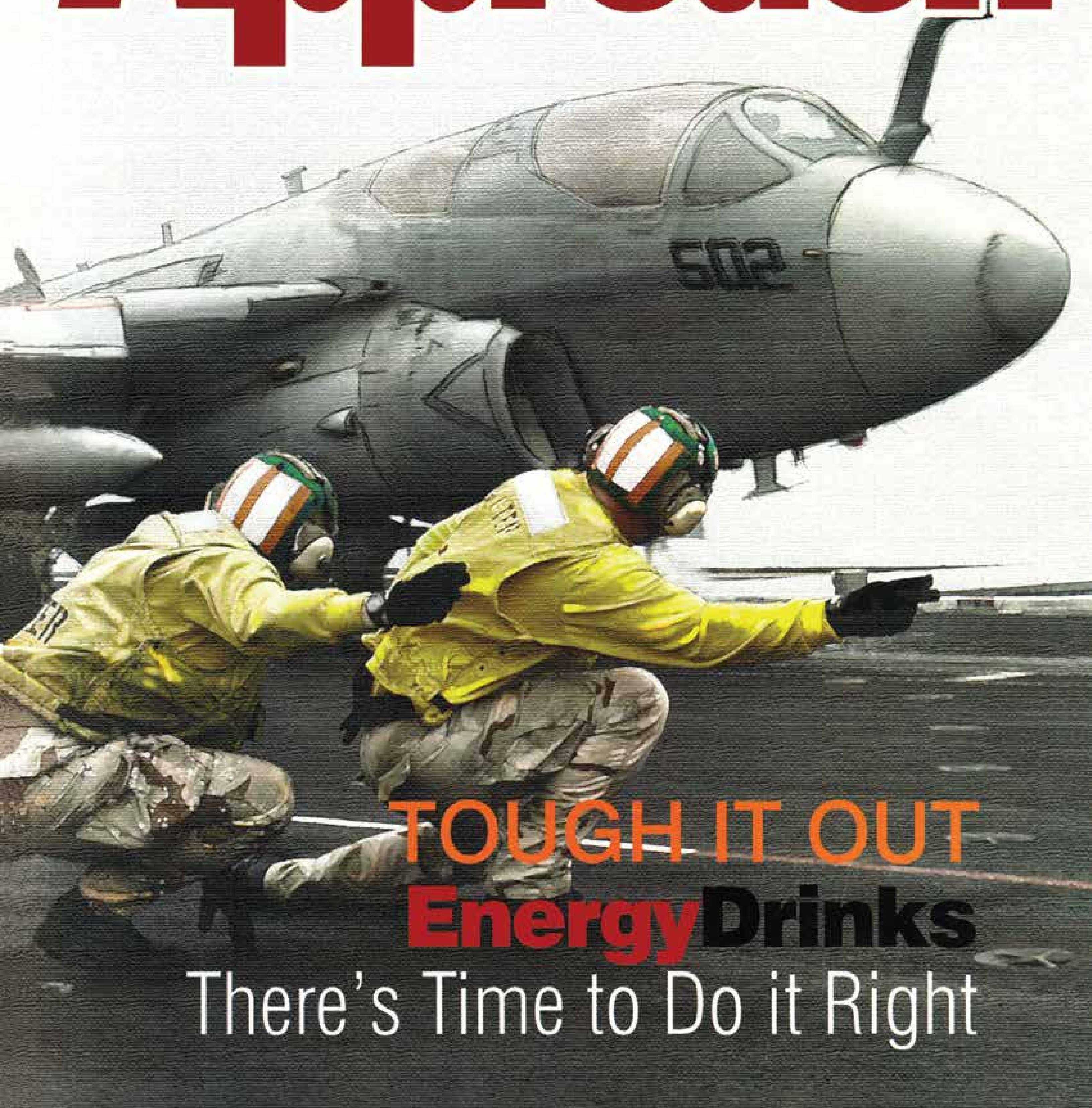
# Approach




## TOUGH IT OUT

## Energy Drinks

## There's Time to Do it Right

# The Navy & Marine Corps Aviation Safety Magazine

January-February 2013 Volume 58, No.1

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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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# CON

## Features



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Editor's note: The photo of the aircraft on page 26 in the November-December 2012 *Approach* was provided by Andy Thomas.

## January-February Thanks


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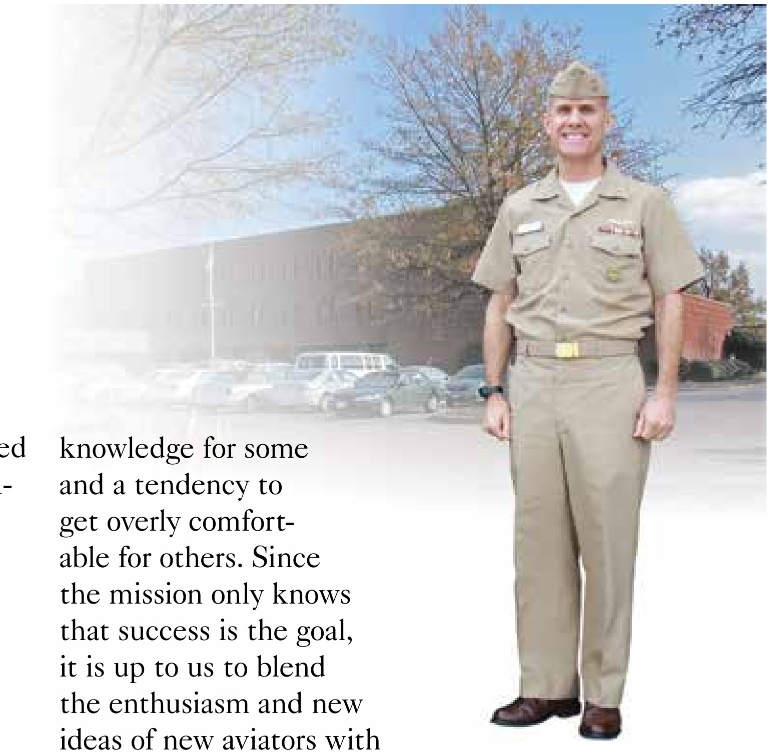

# Moving On, Moving Forward

Not all tours of duty are the same. When I started my career in 1979, making it through the training command flying the T-28 seemed like a huge hurdle, but with hard work and great instructors I made it. Getting qualified in the P-3C as a junior officer, followed by several sea and shore rotations, also presented many challenges. One common thread throughout my career was the challenge to complete each event, mission and on- or off-duty activity safely. We didn't always say it, but we all knew that making safety integral to our up-front planning and decision process was the right way to do business. Introduction of ORM helped a great deal by providing an easily understood framework to guide our deliberate and time critical risk management actions.

This tour at the Naval Safety Center has been an eye-opener, and I mean that in the best way. A look at our mishap rates, in all categories, shows significant improvement over the years. The fleet is not just saying safety is a priority, but also living it. My view of safety is now clearer, and my passion for it has never been higher. And as that same look at the rates show, we must continue to improve.

Risk management is tightly woven into the fabric of *Approach* and all our other media products. The urge to get the latest copy of *Approach* is proof that effective safety and risk management thinking, planning and action are "in our professional DNA." Most important to the enduring success of *Approach* is the diversity of thoughts and ideas on the concept of dealing with risk. It is ever-present in what you share with us through your stories and contributions. I believe we will keep improving as risk management continues to flourish as part of our culture — in everything we do.

Our professional mandate is that every flight requires us to perform at our best, with no room for a lack of NATOPS/systems knowledge or complacency. Our junior pilots and our most senior pilots will always have a particular challenge: a lack of experience and knowledge for some and a tendency to get overly comfortable for others. Since the mission only knows that success is the goal, it is up to us to blend the enthusiasm and new ideas of new aviators with the seasoned judgment of those who have made a lot of tough calls for optimum results.

We are at a point in Naval Aviation's maturity where Human Factors dominate mishap causal factors. To take the mishap rate down to the "next level" we must discipline ourselves to identify the right modifications or additions to existing controls that will ensure human factors are identified in sufficient time to proactively mitigate them. It is hard work to be sure. But the rising cost of new aircraft will drive up our total mishap costs if we fail to make progress in what could well be our enduring primary reason for mishaps.

I encourage you to seek out safety jobs as you progress through your careers. There is great satisfaction in looking after the safety of our people, as success always follows. Being the Safety/NATOPS officer as a department head made me a much more successful Operations Officer and Commanding Officer, with dividends that have served me well in every other tour I have had since then.

Seeing all that Naval Aviation has accomplished throughout my career, I remain completely confident in the professionals who make up our Navy and Marine Corps team. Keep raising the bar for professional execution and better results will follow!

RADM Brian C. Prindle

The Initial Approach Fix

# Naval Safety Center Resources for Mishap Prevention

**Naval Safety Center Aviation Safety Programs**
http://www.public.navy.mil/navsafecen/Pages/aviation/Aviation.aspx
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http://www.public.navy.mil/navsafecen/Pages/aviation/culture/AviationCultureWorkshop.aspx
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**Crew Resource Management (CRM)**
Lt. Tony Anglero, Antonio.anglero@navy.mil
(757) 444-3520 Ext. 7231 (DSN 564)

**Web Enabled Safety System (WESS)**
http://www.public.navy.mil/navsafecen/Pages/wess/WESS.aspx
Helpdesk (757) 444-3520 Ext. 7048 (DSN 564)
NRFK_SAFE_WESShelp@navy.mil

**Operational Risk Management (ORM)**
http://www.public.navy.mil/navsafecen/Pages/orm/ORM.aspx
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**Aviation Maintenance**
http://www.public.navy.mil/navsafecen/Pages/aviation/maintenance/aviation_maintenance.aspx
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(757)444-3520 Ext. 7265 (DSN 564)

**Aircraft Mishap Investigations**
http://www.public.navy.mil/navsafecen/Pages/aviation/investigations/investigations.aspx
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(757) 444-3520 Ext. 7236 (DSN 564)

**Airfield Operations/Bird Animal Strike Hazard (BASH)**
http://www.public.navy.mil/navsafecen/Pages/aviation/AirfieldOperations.aspx
Lt Vern Jensen, vern.a.jensen@navy.mil
(757) 444-3520 Ext. 7281 (DSN 564)

**Aeromedical**
http://www.public.navy.mil/navsafecen/Pages/aviation/aeromedical/Aeromedical.aspx
Capt. Lee Mandel, Lee.mandel@navy.mil
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**Aviation Safety Surveys**
http://www.public.navy.mil/navsafecen/Pages/aviation/maintenance/aviationmaintenancesurvey.aspx
Maj. Dave King, USMC, david.a.king1@navy.mil
(757) 444-3520 X7223

**Aviation Data**
http://www.public.navy.mil/navsafecen/Pages/statistics/aviation/av_stats_main.aspx
Customer support
(757) 444-3520 Ext. 7860 (DSN 564)

**Statistics**
http://www.public.navy.mil/navsafecen/Pages/statistics/statistics.aspx
Customer support
(757) 444-3520 Ext. 7860 (DSN 564)

## Additional Resources

**School of Aviation Safety**
https://www.netc.navy.mil/nascweb/sas/index.htm
newsletter: https://www.netc.navy.mil/nascweb/sas/newsletters.htm

**Command Safety Assessments**
www.safetyclimatesurveys.org
Dr. Bob Figlock, (831) 641-9700/(888) 603-3170
surveys@advancedsurveydesign.com

**Naval Aviation Safety Programs (OPNAVINST 3750.6R)**
http://www.public.navy.mil/navsafecen/Pages/aviation/3750_Guidance.aspx

# We Broke the Airfield

BY CAPT. BYRON DRADER, USMC


**AFTER COMPLETING** the last section approach of a section-lead-under-training flight, my crew's day took a turn for the worse. As we approached the break, tower advised that our interval was a Citation on downwind. We located the Citation, gained our interval and initiated a three-second-break for runway 23R. We extended downwind two miles for the Citation.

*The aircraft experienced a sharp right wing drop, followed by a hard swerve to the right.*

I had electronic countermeasures officer one (ECMO-1) confirm the current winds once we were on final. Tower called the winds 230 at nine knots, allowing me to take the right side of the runway. This meant I would not have to cross in front of my wingman to turn off onto the taxiway. Following the wind call, I quickly adjusted my approach from runway centerline to the right side of the 200-foot-wide runway.

At 400 feet my radar altimeter went off, and I called to the crew, "Three down, and we are cleared to land."

Simultaneously, another aircraft was cleared for takeoff on 23L. However, because of our internal communications, we missed tower's "190 at 15 gusting 18 knots wind" call for the departing aircraft.

I executed a flared landing at 150 knots and began to roll down the right side of the runway. I quickly noticed that our flaperon popups had not deployed, and I reached down to confirm they were in the armed position. About 1,500 feet after touchdown, I keyed the microphone to tell the crew of the popups failure. The aircraft experienced a sharp right wing drop, followed by a hard swerve to the right.

I immediately applied full left rudder and told the crew, "I think we blew the right main."

As we continued down the runway, our full left rudder had no effect, so I tried differential breaking by applying full left brake. This action had no effect, and the aircraft continued to veer right. By this time the right edge of the runway was fast approaching.

I called over our TAC frequency, "Dash 2, waveoff!"

I then engaged nosewheel steering (NWS), even though we were at about 120 knots — 40 knots above our normal 80-knot, NWS engagement speed. This combination of corrections finally stopped the hard swerve to the right. As the aircraft came back under control, our right wing returned to a level attitude. We taxied off the runway, determined that we had not blown the right tire. We stopped in the holdshort to wait for our wingman. They gave our jet a thorough look-over and reported no visible damage. We then taxied to the refueling pits before heading back to the line for a hot switch. Maintenance later confirmed that there was no damage to the aircraft.

After talking with maintenance, we agreed there were no mechanical issues with the aircraft that could have caused the right swerve. The right main had not blown, and the right strut had the proper pressure. The only explanation was that a wind gust had caused our left wing to rise, resulting in our left weight-on-wheels (WOW) switch not activating. Without that switch, the popups will not activate. Had we known about the possibility of gusting crosswinds, we would not have made a flared landing. The fact that we missed that portion of tower's radio call reemphasized the need for sterile cockpit communications.

On most days, without a wingman, we would have landed on centerline, and the sharp swerve would have been only a good debriefing point. Light landing weight, delayed popup deployment or gusting winds are low risk. Put these elements together and you've turned an uneventful day into an interesting one.

Consideration should be given to having both aircraft land on centerline. Once each aircraft is under control, the pilots take alternating sides of the runway. This would require taking increased separation on final, but it would mitigate issues that could occur during landing roll out.

While aircrews are cognizant of some hazards just off the runway, such as arresting gear engines, other potential hazards are not so well-known. For instance, at Cherry Point, runway-distance-remaining markers are located 75 feet outside the runway, and the runway-edge lights are located just three feet from the runway.

The following morning we got a call from base ops asking if we were aware we had struck two runway-edge lights. We were unaware that the runway-edge lights were located within three feet of the runway. We were also unaware that these lights are not recessed into the runway — they are on posts standing six inches high. We had not felt our aircraft strike the lights. There was no damage to the aircraft, so we had no reason to believe we had hit the lights. The incident report was delayed until that day. The cost of our damage to the airfield was $400.

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CAPT. DRADER FLIES WITH VMAQ-1.

# The Dangers of **Energy Drinks** and Supplements

BY LCDR. T.E. SATHER MSC, CASP


Many people assume that natural products are safe and do not have side effects. This is far from the truth. Natural products can be as toxic as synthetic ones.

Aviators know that NATOPS prohibits the use of over-the-counter medications, and that you must get approval from your flight surgeon to use nutritional supplements. There is a very good reason for this: You just don't know what is in these drinks. Nutritional supplements and their derivatives (like energy drinks) are not regulated by the Food and Drug Administration (FDA) — unlike medications, soft drinks, and even tap water, which are tightly regulated to ensure safety and purity.

America has become a culture of instant gratification. We expect results almost immediately and nothing is fast enough. We are turning to stimulants, painkillers and anti-anxiety meds to help launch ourselves through the endless daily to-do lists. In today's culture, better living through chemistry is now the norm.

What happens when we get tired, as many of us do, on a daily basis? We turn to some type of energy booster — a cup of coffee, tea or even a high-tech energy drink.

Energy drinks promise to give you wings, to boost you through "that 2:30 p.m. feeling," to be a remedy for a poor diet, and to provide athletic prowess like never before. Energy drinks promise a lot.

This trend toward stimulant drinks seems to be a natural evolution of our love for and, in some cases, dependence on caffeine. But, energy drinks go beyond the effects of simple caffeine. They add additional stimulants derived from vitamins, herbs, and amino acids to create a more intense energy boost or rush.

Teens and young adults, both athletes and non-athletes, consume energy drinks at an alarming rate. Energy drinks, including small "shot" products, are readily available in grocery stores, convenience stores and a variety of other places. They are advertised to enhance energy, increase focus and improve athletic performance with catchy slogans such as, "Bigger, better, faster and stronger." They are scientifically formulated to provide an incredible energy boost. Products now come in gum form and energy chews, claiming to pack as much caffeine as a cup of coffee. There are over 600 brands of energy beverages on the market with a wide variety of ingredients. However, most are just slightly different concoctions of the same stock ingredients.

As advertised, energy drinks will give you a boost of energy. They deliver high concentrations of caffeine and other stimulants to give the drinker a rush of energy. They contain huge quantities of sugar, caffeine, the amino acid taurine and B vitamins. Some of the newer beverages are throwing in powerful herbal compounds such as yohimbine hydrochloride and evodiamine (EVO). Some nutritionists believe these are more powerful (and maybe dangerous) stimulants than caffeine. Some products are so potent that an eight-ounce can contains four times the caffeine per ounce as a traditional energy drink. Some ingredients, at least those that are monitored and regulated by the FDA, can contain 800 times more than the recommended daily allowance (RDA). Energy drinks may also contain a huge variety of natural, exotic ingredients like guarana, green-tea extract, yerba mate, bitter orange (synephrine or octopamine), vinpocetine, 5- hydroxyl tryptophan, methylphenylethylamine (5-HTP) and ginseng.

A large number of supplemental products have dubious value, content and quality. Independent tests have found that some products are contaminated with unwanted, potentially harmful ingredients such as heavy metals, pesticides, bacteria and prescription drugs. The purity, potency and identity of a supplement may also vary by manufacturer and from product to product. The makers of energy drinks are under no legal obligation to disclose the source of any natural supplement. Because their product lines are classified as nutritional supplements, they are not bound by the same level of regulation and oversight as soda or juice companies.

Researchers do not know the exact effects of all the ingredients in energy drinks when used in combination with one another. It is the combination of the ingredients, the concentration, and the speed of ingestion that make energy drinks dangerous. Almost all the studies done on energy drinks have involved relatively small sample sizes of young, healthy individuals and yield little evidence of short-term ill effects. We need studies with larger sample sizes using methods to determine whether long-term use of energy drinks will translate into negative effects.

There are many documented accounts where emergency room physicians describe cases of seizures, delusions, heart problems and kidney or liver damage in people who had downed one or more of these nonalcoholic energy drinks. Caffeine-associated deaths have been documented. Because of this evidence the American Association of Poison Control Center created a new category to track these cases. According to the Poison Control Center, from October 2010 to February 2011, there were more than 1,000 energy-drink overdoses; mostly children and young adults, with the average consumption of between 3 to 8 cans (although one individual consumed 80 cans).

Q. What's the best single method to improve energy levels and increase the ability to concentrate?
A. Get an extra 60 to 90 minutes of sleep each night.

There is a great variety of energy drinks on the market with different "energy blends" touted to enhance your energy level. The primary ingredients are usually caffeine, L-Taurine, glucuronolactone, and B Vitamins. Some of the more common ingredients include guarana, ginseng, L-Carnitine, inositol, choline, creatine, gingko biloba, milk thistle, and an assortment of vitamins.

Many energy drinks include a list of ingredients without quantity as part of a "proprietary blend," by which only the total amount of the blend is listed. Many of the ingredients may be added for marketing purposes. Most ingredients are far below an optimal or even therapeutic dose that would elicit an effect. Some ingredients, like sugar, cause no harm and are treated like a food. Others, like most of the vitamins, are just excreted from the body in the urine. However, this is not true of all ingredients.

The biggest danger of consuming energy drinks has to do with caffeine, which is the most frequently used psychoactive drug in the world. Caffeine and its relatives theophylline (in tea) and theobromine (in chocolate) heighten our alertness. Caffeine can also be "hidden" in herbs such as guarana (1 gram of guarana has about 40 mg of caffeine). Doses over 250 mgs consumed over a short period of time can trigger a condition called "caffeine intoxication." This is a clinical syndrome which is marked by nervousness, anxiety, restlessness, insomnia, gastrointestinal upset, tremors, rapid heartbeat, restlessness and pacing. Some people may also experience euphoria and muscle twitches. Caffeine in extremely large doses can be deadly. Caffeine poisoning or reports of caffeine intoxication are no longer uncommon in the U.S. Caffeine-poisoning cases have increased significantly over the last few years. Fatal overdoses would require drinking 30 to 60 cups of coffee in one morning.

The caffeine content of energy drinks varies. While the FDA limits the caffeine content in soda to 71 milligrams per 12-ounce serving, energy drinks are not bound by these limits. A 12-ounce serving of a popular energy drink has 107 milligrams of caffeine, compared with 34 to 38 milligrams for the same amount of soda. Some energy drinks may contain more than 400 milligrams of caffeine.

The adage "All things in moderation" holds true for most of the ingredients in energy drinks. Unfortunately, the temptation to outdo the competition has led the manufacturers of energy products to disregard the topic of health and safety when creating their formulas, which has resulted in more and more potent and dangerous mixtures.

Because energy drinks contain high levels of caffeine and other stimulant ingredients, athletes should avoid putting their health at risk by consuming such products. When these stimulants are combined into one beverage, they can reveal an undiagnosed cardiac abnormality or instigate a serious cardiovascular response. Athletes, parents, coaches, teachers and trainers should be informed of the potential harm of these products.

What about energy drinks and aviators?

Research is limited on the effects of energy drinks on a pilot. A study done at Oklahoma State University looked at reaction times. OSU researchers divided a group of 30 student pilots into two groups and asked each to complete a series of flight exercises on two separate days. Thirty minutes before takeoff, one group drank a 16 ounce energy drink and the other group drank a placebo. The groups switched drinks on the second day of exercises. The results were startling, especially if you're a flight instructor.

Student pilots (civilian) who consumed energy drinks before flying had a harder time maintaining straight and level flight. They also were about 10 seconds slower to return their aircraft to the proper position after executing a complex turn, and were five seconds slower to complete an emergency checklist (and less accurate at completing the EPs) than those drinking the placebo. Eighty-seven percent of the students who consumed energy drinks had a larger number of flight errors than they did after consuming the placebo.

Why did this happen? It is theorized that the caffeine, taurine, sugar, and various other stimulants make it difficult for the pilot to perform multiple tasks simultaneously. The study also showed an almost cavalier attitude to the use of these drinks, even though 67 percent of the participating flight students agree that energy drinks have a negative effect on collegiate flight students' ability to fly an aircraft. The study showed that 57 percent of student pilots surveyed routinely consumed these drinks between one to three times a week and 60 percent of them reported that they consumed energy drinks the same day they piloted an aircraft. The same percentage of respondents also had observed other student pilots consuming energy drinks the same day they piloted an aircraft.

While the idea of slamming down an energy drink before a flight may help a pilot or aircrew stay awake or to energize them during a long flight, research says this may not be in everyone's best interest. What's the best single method to improve energy levels, increase the ability to concentrate, sharpen memory, strengthen the immune system, and decreases people's risk of being killed in accidents? The answer may surprise you. Researchers have discovered that getting an extra 60 to 90 minutes of sleep each night will do just that.

While many people argue that they get by just fine on very little sleep, they also find themselves reaching for a little boost as that "2:30 tired feeling" takes hold once again.

The bottom line is, while in a flight status, energy drinks are a no go!

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# A Simple Decision

BY CAPT. GREGG SAFINSKI, USMC

After nearly eight weeks in country, the steep learning curve had finally begun to level off, and the comfort level of the crew had grown exponentially.

I was Dash-2 to an AH-1W Super Cobra, and we were tasked with a night-into-day escort of two MV-22s with 40 Marines onboard into a hasty landing zone (LZ). The Marines were part of a raid package searching a cluster of compounds well away from any friendly forward-operating base (FOB), combat outpost (COP) or patrol base (PB). This mission was different because we were tasked with taking four Marines from the ground-combat element (GCE) to serve as an aerial-reaction force (ARF). If personnel or vehicles, commonly known as "squirters," were spotted fleeing the objective area, the Huey would land and drop off the ARF to interdict.

I had a junior copilot in the right seat, an extremely experienced crew chief manning the left side with the GAU-21 (.50 caliber machine gun), and a junior crew chief manning the right side with the GAU-17/A (7.62mm mini-gun). We arrived on-station, completed a sensor scan of the compounds, and the MV-22s conducted the insert without a problem. Our section remained in the overhead after the insert to provide over-watch of the GCE as they entered the compounds and established security. With the ground situation under control and no evident squirters, the GCE asked us to drop off the four Marines next to one of the compounds, so they could rejoin the raid force.

As a utility helicopter, the UH-1Y Huey is routinely tasked with a variety of missions. We felt we had seen them all and were well-prepared for operating in Helmand Province, Afghanistan.

Landing an aircraft near its maximum gross weight in a potential brownout zone, under low-light-level conditions and with a junior copilot is not ideal. However, enough time had elapsed that the sun was now peeking above the horizon, and the aircraft was 300-pounds lighter on fuel. I felt more at ease with the task at hand. The joint-terminal-attack controller (JTAC) requested we insert the ARF adjacent to a compound the GCE had secured, not the insert LZ.

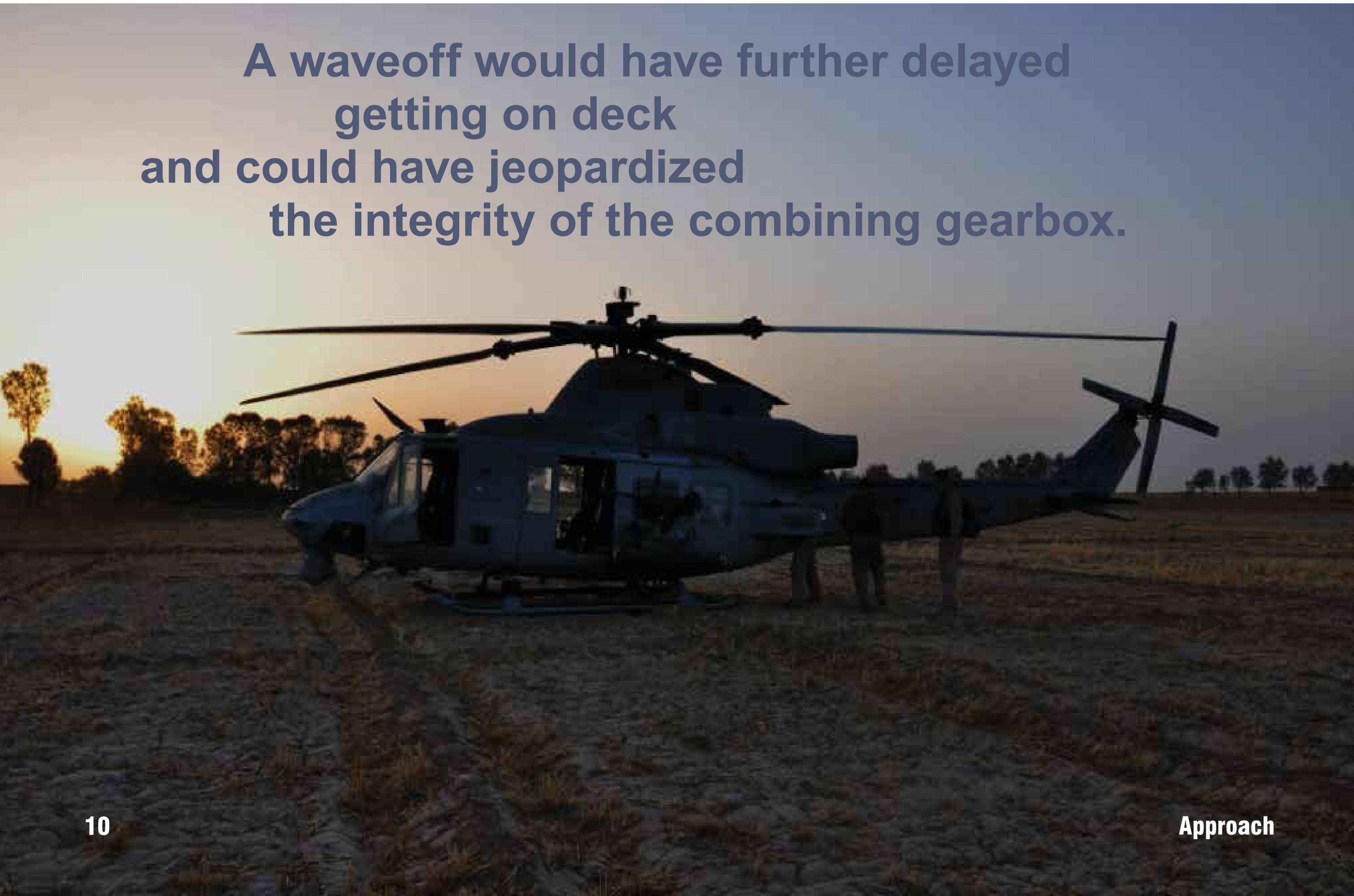
The first zone selected was a mix of decaying poppy plants and sparsely planted wheat adjacent to the compound. I briefed the crew that we would land on the wheat to help reduce some of the brownout. We spiraled down from our holding altitude and made a low-level, straight-in approach to the zone. As the aircraft decelerated below 40 knots, I engaged the hover-aid graphic. At 25 feet, the crew chief stated, “Signature at the tail” — meaning a dust was cloud building.

**THE ROTOR WASH KICKED UP ROOTS** and debris from the decaying poppy plants, obscuring the ground. As I called, “Waving off,” I could hear the clumps of roots bounce off the windscreen and fuselage. I instantly pulled the collective to 100-percent torque, aligned the “pipper” on the horizon, and ensured the “lollipop” on the hover-aid graphic was at the 12 o’clock position. The copilot did exactly what he was supposed to do, calling out “Two positive rates of climb,” “Airspeed off the peg,” and “Pipper on the horizon.” After a couple tense seconds, the aircraft climbed out of the dust. The crew collectively breathed a sigh of relief.

For the second zone, I briefed the crew that we’d make an attempt at a portion of the field that had more vegetation but was farther away from the compound and friendlies. Despite the denser vegetation, the brownout conditions were the same. After waving off for the second time, I decided to insert the four Marines into the LZ used by the MV-22s. The downside to this zone was the distance away from the main body of the GCE. The four Marines would have to cover 150 meters of open terrain to rejoin the friendly elements established in the compounds.

We set-up for another low-level, straight-in approach to the zone. The brownout was bad but manageable. After touching down, the inside of the cabin was covered in wheat chaff. I thought nothing of it at the time and conducted a reduced visibility takeoff out of the zone. As I called, “Visual” with the lead aircraft, I heard the distinct tone of the warning, caution and alert (WCA) system. My first instinct was an overtorque due to the high power required to depart the zone. To my surprise, the WCA was for CBOX TEMP HI. I quickly pulled up the systems 1 page on the multi-function display (MFD) to

**A waveoff would have further delayed getting on deck and could have jeopardized the integrity of the combining gearbox.**



diagnose the problem. In the UH-1Y, the oil cooler is driven by a hydraulically-driven fan powered by either the hyd 1 or hyd 2 systems. Without the oil-cooler, the combining gearbox and transmission-oil temperatures will rapidly rise, and the aircraft will become unflyable within two-and-a-half minutes. If the primary system failed, the aircraft would have displayed the PRI OIL COOLER FAIL WCA. After looking at the systems 1 and 2 pages, it appeared that the oil cooler was functioning, but the combining-gearbox-oil temperatures continued to rise at about one degree per second.

The senior crew chief said debris from the landing probably clogged the oil cooler, preventing airflow. I quickly decided to land at the LZ we just left, and asked the lead aircraft to coordinate with the JTAC to provide security. As I turned toward final, the thought of waving off was not an option. In the 10 seconds since the WCA illuminated, the oil temperature had climbed well above the NATOPS limit and continued to rise.

A waveoff would have further delayed getting on deck and could have jeopardized the integrity of the combining gearbox. We landed in the zone without a problem and immediately shut down the aircraft. The crew chiefs opened the oil-cooler panel and saw a two-inch pillow of wheat chaff clogging the oil cooler. They immediately began to clear the obstruction.

The four Marines we dropped off had posted security to isolate the compounds to the southwest. So far no one was hurt. We had identified the problem and expected a quick fix. However, the issue complicating our situation was that lead aircraft had only 10 minutes until they hit bingo-fuel state.

If the lead aircraft had to return to base (RTB) for fuel, it would be at least an hour before they'd be back on-station. We had just landed an aircraft in an open field, 40 miles from the nearest friendly position, and were sure that some unwanted attention was on the way. The crew chiefs quickly cleared the obstruction, and all systems looked good. By this time the oil temperature had cooled to its normal operating range. We departed the zone as lead called bingo, and we headed for the airfield.

As we climbed to join with lead, I noticed the combining-gearbox-oil temperatures start to rise again, but at a much slower pace than before. I notified lead of the problem and circled over the landing zone. Could we make the 20-minute flight to the nearest friendly FOB, COP, or PB with an LZ? Compounding the problem was our near-bingo fuel state. I had a choice between risking the 20-minute flight or landing at an LZ where we had 44 Marines that could provide security. The downside to landing in the LZ would be the massive maintenance recovery effort required, and the unwanted attention it would draw from the insurgents. The last choice I wanted was to get halfway and have to conduct another precautionary-emergency landing (PEL) away from any support, leaving the four of us to fend for ourselves.

After about 30 seconds of monitoring the oil temperature, I decided to head to the airfield. I pulled 65-percent torque en route, yielding 110 knots. A higher power setting would have given a maximum cruise airspeed of 125 knots but would have exacerbated the rise in oil temperatures. I wanted to hold the lower power setting and accept the lower airspeed.

All four of us watched the gauge during the flight home, calling out every degree rise in temperature. Lead was miles ahead of us but still in radio contact. I asked him to coordinate with the airfield and declare an emergency for us. In what seemed like the longest 20 minutes of my life, I wondered if I had made the right call. We crossed the threshold of the airfield as temperatures again reached the NATOPS limits. Our postflight found more wheat chaff inside the compartment. It had slowly made its way on top of the oil cooler, obstructing air flow.

We were now behind friendly lines. We cleaned the oil-cooler compartment, completed a functional ground turn, and continued supporting our assigned missions for the day.

Looking back, I had made the right decision and a maintenance-recovery effort had been avoided. However, during the 20-minute flight, I wasn't so sure. The lesson learned is that a relatively simple decision in CONUS becomes complex in a combat environment. NATOPS does not spell out how to handle every possible aircraft emergency. Aircraft commanders must rely on experience, and more importantly, sound judgment when making a decision.

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# A Series of Assumptions

**BY LT. KRISTEN ERPENBACH**

As I came around the 90 in the landing pattern, the hair on the back of my neck stood up — something was wrong. My night, field-carrier-landing-practice (FCLP) hop near Pensacola wasn't going as planned.

NAF Fentress was closed for repairs and NAS Oceana was saturated with aircraft, so Carrier Air Wing Seven had detached to Pensacola. We would rock the Cradle of Naval Aviation while completing FCLPs for our upcoming boat detachment. The two-week detachment required a fair amount of coordination, and was in many ways a trial run for future air wings. Our goal was to set the example and have a successful det.

We arrived on a stormy, late February afternoon. We had three days of weather cancellations before get-

**I began my approach turn but instantly sensed something was wrong.**

ting into solid FCLPs. On my first night flight, I was Dash 2 of a section flying to NOLF Choctaw, which is located 15 miles to the east of Pensacola. While it's easy to get there, it has restrictive course rules around the airfield. NAS Whiting is three miles to the north and the R-2915 area is to the east. You can't spill out to the north because helicopters operate at low altitudes around Milton. The restricted area to the east speaks for itself. We gave a thorough brief of the administrative aspects of this flight because we were unfamiliar with the airspace and course rules. It also was our first night sortie to Choctaw.

When our flight-of-two entered the break for runway 36, paddles said there were two in the pattern and our interval was lifting. As we delayed our break for our interval, I became concerned about spilling out to the north. My lead broke, and I quickly counted to four before following him to downwind. The other two aircraft were in sight before we broke. I rolled out on downwind with my lead in sight and then started my landing checklist. After confirming three-down-and-locked, I looked up and didn't see my interval. The cultural lighting in the distance complicated the search to find his aircraft, and the unfamiliar airfield left me with limited ground reference. As I approached the abeam position, I hadn't heard my lead make an abeam call. I assumed that someone was on the ball, but as I approached the 180, I still had not reacquired my lead.

Earlier in the day, I'd had a conversation with paddles about 180 ground gouge. We had decided that feet-wet would likely put you long-in-the-groove. As I passed the 180, I heard a quick "Hornet ball" call, and assumed it was my lead. I had already been feet-wet for three to four seconds, so I decided that I had better turn because I already expected to be long in the groove.

I began my approach turn but instantly sensed something was wrong. While turning through the 45, I heard the unsettling sound of my flight lead making his ball call. I didn't see him because I was belly up to his airplane. I had just created a simo-run.

**While turning through the 45, I heard the unsettling sound of my flight lead making his ball call. I didn't see him because I was belly up to his airplane.**

Within a second, paddles made an accentuated, "Simo-run, simo-run" call.

My lead called "Up and right," while I leveled off and went left, elevating after I had him in sight. We were now flying abeam each other in the groove. We had narrowly missed a midair collision. Paddles started to talk to us, specifically me. I was instructed to RTB, which I did.

Situational awareness (SA) is paramount when multiple aircraft are operating in the same piece of sky. Maintaining visual on all airplanes in the pattern is ideal, but, keeping sight of your interval is a must. Losing positive visual identification of my interval was the single most important factor that led to the simo-run.

I needed better SA of the original two aircraft while on downwind, either by visual confirmation or by radio calls. I should have realized earlier that the FCLP pattern had become extended. We were operating at an unfamiliar airfield without the typical SA building cues of Fentress or Oceana, so I should have looked for nonstandard flow. The cultural lighting was another contributing factor we hadn't considered. I should have confirmed his position in the pattern with a radio call. The multifunctional information distribution system (MIDS) did not work for me that night. It would have been another way to improve my situational awareness.

Regardless of the challenges, it was my responsibility to maintain sight of my interval and clear the flight path of my aircraft. I should not have initiated my approach turn without knowing where he was in the pattern. I made a series of assumptions based on radio calls, and I did not key the radio to verify his location. The final take-home point is that you should trust the hair on the back of your neck — it's rarely wrong.

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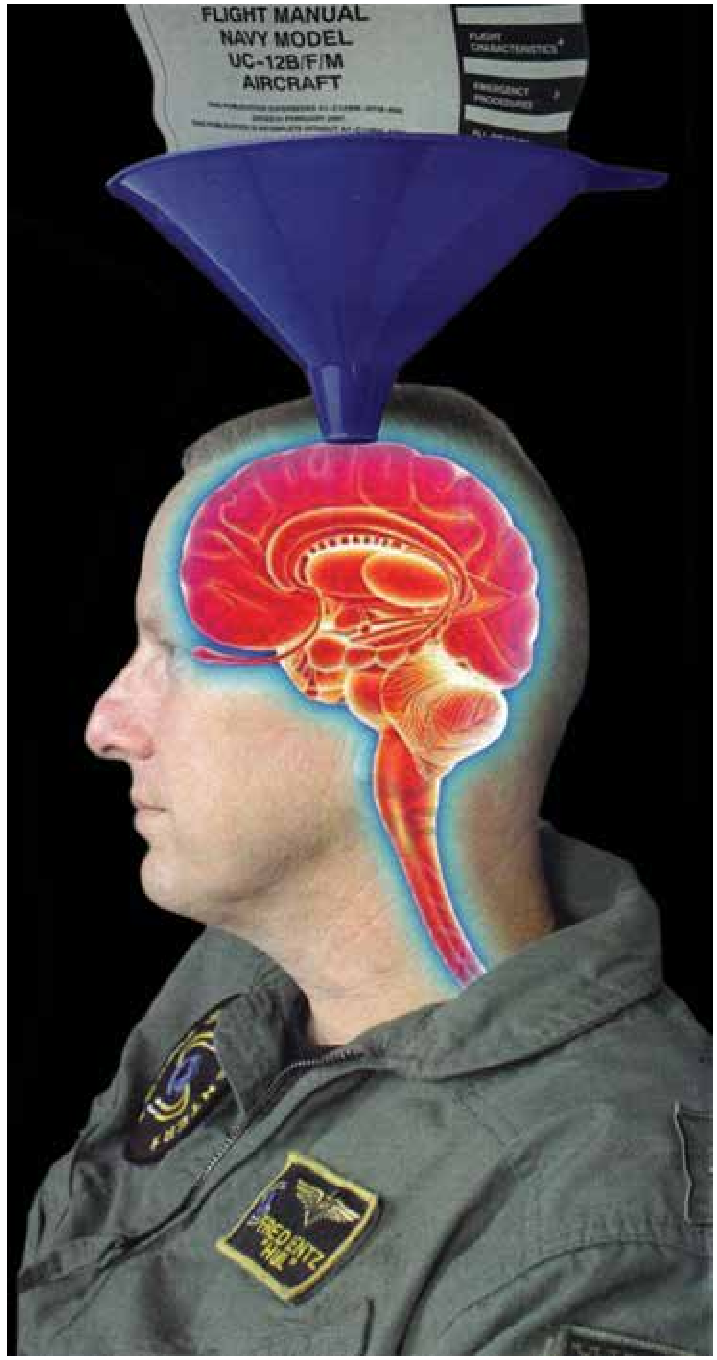
LT. ERPENBACH FLIES WITH VFA-83.

*Simo-run is a term typically used during bombing patterns to indicate two aircraft have commenced a run simultaneously. In this situation, the term was used to notify both aircraft in the pattern that Dash 2 had cut off Dash 1 while rolling into the groove. — Editor*

# The Knowledge Factor

**BY CDR. FRED LENTZ**




We've heard the mantra, "Know your NATOPS," more than a few times in our careers. If you ever suffered an aircraft-systems failure, these words rang true as you correctly analyzed the problem and avoided a mishap. Good outcomes are not always the case.

As an aircraft-mishap investigator at the Naval Safety Center, I've investigated several mishaps where someone's lack of systems knowledge or their inability to execute critical memory items in an emergency-procedure (EP) checklist led directly to a crash. While these factors do not necessarily apply to every mishap, NATOPS knowledge is your first and best weapon in avoiding a mishap.

An illustration of this from a commercial airline was the engine failure in an Airbus A380 in 2010. In that incident, one of the four massive engines suffered an explosive failure. Chunks ripped through the wing and into the fuselage. These chunks not only stopped the engine but also severed more than 600 wires, compromising almost every aircraft system: hydraulics, electronics, brakes, fuel, flight controls and landing gear. The captain, known for his familiarity with the aircraft, had to aviate, navigate and communicate. He had to sort through all the data that was presented to him by the 250,000 onboard sensors to figure out what worked and what didn't. He also had to maximize the effectiveness of his crew to land the aircraft and save the lives of the 469 people.

The potential for catastrophe did not end with touchdown. Unable to dump fuel, the aircraft was very

Unable to figure out the malfunction, the pilots put the aircraft in a stall when they kept feeling like they needed to climb by raising the nose.

heavy and, therefore, fast at touchdown. The leaking fuel near the abnormally hot aircraft brakes prevented anyone from exiting the aircraft until it was deemed safe, an hour after landing. I'm guessing that 469 people facing potential fire and unable to escape were very uncomfortable. Through it all, this captain credited his knowledge of the aircraft with preventing disaster.

Contrast this with the Airbus A330 crash into the Atlantic in 2009. In this mishap, the flight crew misdiagnosed an icing situation that gave errant airspeed data when the pitot tubes were blocked with ice. Unable to figure out the malfunction, the pilots put the aircraft in a stall when they kept feeling like they needed to climb by raising the nose. This action caused a rapid descent at slow airspeed and killed all 228 people onboard. At no time did the flight crew refer to checklists or use any crew coordination to fly the aircraft or diagnose the problem.

As we develop newer aircraft and upgrade our older ones, the systems become more complex and require more in-depth knowledge. An engine failure in a multi-engine aircraft may not be a big deal in itself. However, there are likely second- and third-order effects of that engine failure that will affect your ability to fly and land the aircraft. Knowing how a failure of one system affects your flight controls, hydraulics, landing gear and anti-skid could be the difference between an uneventful landing and a mishap.

We practice emergency procedures in simulators and on NATOPS checks. Is that enough for proficiency? Are you not only comfortable with those checklists, but familiar enough with them to know what can happen as a result of executing the steps within them? Too often in mishap investigations do we see that EPs were executed incorrectly or ignored for a variety of reasons. We see misdiagnosis of malfunctions or failures, lack of crew coordination and communication, and overconfidence in abilities that contributed to causing the mishap.

Our aircraft do break, but if you know that and still head out for preflight with a "kick the tires and light the fires" attitude, you may read about your event in an safety investigation report (SIR). Study

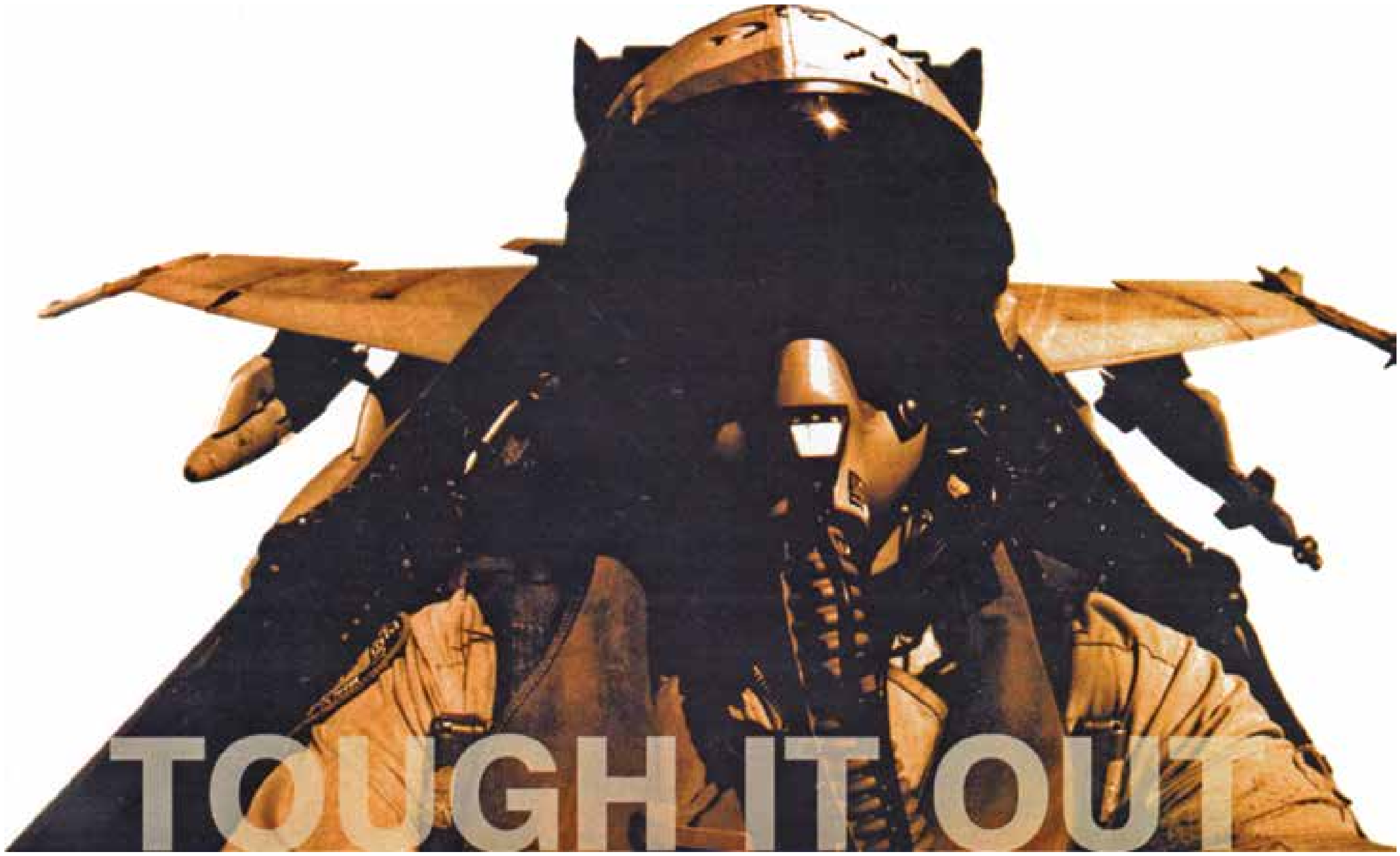

Whatever your task, do it by the book, everytime.

NATOPS, become more familiar with the systems and ask questions when you do not understand something. Figure out how systems interact, conduct meaningful NATOPS and EP training for all aircrew, maximize simulator time, and effectively use every moment of your precious few flight hours to be ready when a failure occurs.

No one wants to be involved in a mishap. Each of us has been in a situation where we didn't correctly analyze a failure, or reacted too quickly when applying an EP. In hindsight, after you stepped away from the situation, you could see that a better understanding of the procedures or systems would have given a better outcome.

One of my former squadrons had a poignant quote on its wardroom wall. Captain Roy "Butch" Voris, the first commanding officer of the Blue Angels, said, "Be the best, or don't get in the damn airplane to start with." Being the best starts with knowing your NATOPS.

CDR. LENTZ IS THE HEAD , AVIATION MISHAP INVESTIGATIONS, NAVAL SAFETY CENTER.




# TOUGH IT OUT

**BY LT. TOM SHELLY**

Certain jobs in our military require physical toughness. For example, I think of wet and sandy SEAL candidates holding Zodiacs over their heads on Coronado Beach during BUD/S training. The cold water, lack of sleep, and the constant special attention from their instructors are unlike anything aviators have to endure during our training. Most Type A naval aviators, however, would like to be considered tough. Unlike BUD/S training, we have few reasons to simply "tough it out" in an aircraft. I would argue that in certain circumstances, trying to tough it out can lead you down the wrong road.

It was a typical midafternoon launch during cyclic ops aboard USS Dwight D. Eisenhower (CVN 69) off the East Coast. Our air wing was finishing up TSTA (tailored ships training availability), and I was in the red-air element for a SFWT (strike-fighter weapons and tactics) Level 3 flight. It was the middle of May, and the weather was CAVU, with the air temperature a comfortable 70 F.

Start-up was uneventful, although I noticed little ECS (environmental-control system) flow on deck. I attributed this to the ground cooling fan not turning on. After the cat shot, I felt a gust of cool air in my face. At first, I was relieved the AC was on full blast; the cockpit had become muggy on deck. However, the intensity of the ECS flow was like nothing I had ever felt. I knew the ECS system can be finicky and surging was quite common. I expected the flow to subside once I pulled back the throttles during my Case 1 departure. That didn't happen.

I met my lead on the tanker overhead at 10,000 feet. The air blasting out of the ECS system became colder and colder as I climbed, but I didn't say a word. I cycled the ECS through manual and turned the temperature knob to full clockwise — to no avail. We completed tanking zip-lip, then headed toward the red cap for our first presentation at 24,000 feet. During the climb, the ECS air became colder and colder. By the time we arrived at the red cap, I estimate the air blowing on my hands was about 20 F.

Until now, I hadn't said a word to lead about my situation. My hands were becoming numb, but I still had movement in them. I wanted to tough it out and not say anything. Within a minute, my HUD and canopy started to frost over. I felt a large chill shoot through my body, along with the helpless feeling of panic. What if I become incapacitated? At this point I decided to stop toughing it out.

I told lead, "I've got extremely cold ECS flow, and I am losing feeling in my hands."

Instead of underestimating the situation, he immediately checked us out of the fight and started descending. His plan was to get us to warmer air. However, the air seemed to get even colder and the strength of the flow seemed to surge even higher. I lost all feeling in both of my hands and was palming the stick and throttle. The time for toughing it out was long gone.

I called over tac frequency, "I think I need to go to Cherry Point, now."

I didn't think I could make it another hour to the recovery time.

I heard, "OK, Cherry Point bears 270 for 60 miles." We continued our descent to 2,000 feet. My HUD was completely frosted over.

As I headed to Cherry Point, lead recommended that I turn my ECS to OFF/RAM and turn the CABIN PRESS switch to RAM/DUMP. I took off my mask and turned off the OBOGS system. Minutes later, I felt the air get warmer, and I started to get feeling back in my hands. I told lead I could make it to the recovery time. We headed back to the ship at 3,000 feet and hung out in the Case 1 holding pattern for about 30 minutes. Though the air did get warmer, I never regained full feeling in my hands, and my HUD was still frosted over. Paddles did a great job of talking me down, and gave me the generous no-count for the subsequent 1-wire.

After 30 minutes of troubleshooting, I shut down. I swung through CVIC and walked straight to maintenance to explain the ECS issue. Because it's not a common problem in the Hornet, it seemed like most people didn't believe it was as bad as I said it was. At one point, I even questioned myself. Was it really that bad? Was I just being a wimp?

The AMEs worked on the jet through the night and thought they figured out what was wrong with the ECS. The jet was in the lineup again the next day, although this time, it wasn't a nugget that was going to fly it, it was the skipper. Sure enough, the same thing happened to him right off the cat. He also tried to tough it out as long as he could, but in the end, he got an emergency pull forward because it was unbearable. We discovered that this situation is not discussed in NATOPS. As a result, we submitted a change request.

I've learned that there are times to be tough and times to not push your limits. If you find yourself in BUD/S training, that's the time to tough it out. If you find yourself flying an aircraft, know your limits. Saving your ego is not worth losing a $50 million aircraft.

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LT. SHELLY FLIES WITH VFA-131.

Photo by LI3 Sharay Bennett.

# FLIGHT FOLLOWING, ANYONE?

**BY "MAJ. MYOPIA" AND "CAPT. SANDBAG"**

We walked off of the flight line at Truckee-Tahoe Airport, a beautiful place on the northern side of Lake Tahoe. We were flying our squadron's T-34C, which we use for low-cost (relative to FA-18 operations), range-safety missions and forward air control (airborne) [FAC(A)]. With its D-day invasion stripes and shark's teeth paint scheme, it drew stares of jealousy from the local general-aviation community. We had just completed the first leg of a proficiency cross-country from Miramar through the Owens River Valley.

We ordered sandwiches from the FBO's diner. As my copilot sat down to eat, I walked upstairs to pay for fuel. We had two legs left on our flight, and I was excited to navigate through airspace I hadn't been before. Our route was partly chosen to avoid all temporary flight restrictions (TFRs) related to the President's departure from Los Angeles that morning.

My heart skipped a beat when I saw the President on live TV in Reno, Nev., not far across the state border from Truckee, Calif. I had assumed the President would return directly from Los Angeles to the District of Columbia. I tried to remain calm as I walked up the stairs to hand over the fuel card, thinking that Reno was far enough away and we were well clear of the President.

As I handed the fuel card to the airport operator, he handed me the phone. He had a concerned look on his face. I knew at that moment what was in store. A friendly voice from Homeland Security asked if I was the pilot of the aircraft that had just landed at Truckee, squawking VFR from the south. I sheepishly replied, "Yes." Then she gently informed me that we had landed five miles inside the 30 mile outer ring of the VIP TFR for the Reno area.

I called NORCAL TRACON and I got some more bad news. If I had established flight following and received a discrete squawk, I would have been in compliance for flight and landing within the TFR's outer ring. After several more calls back to our squadron XO and various ATC agencies, we resigned ourselves to the fact that our cross-country was over.

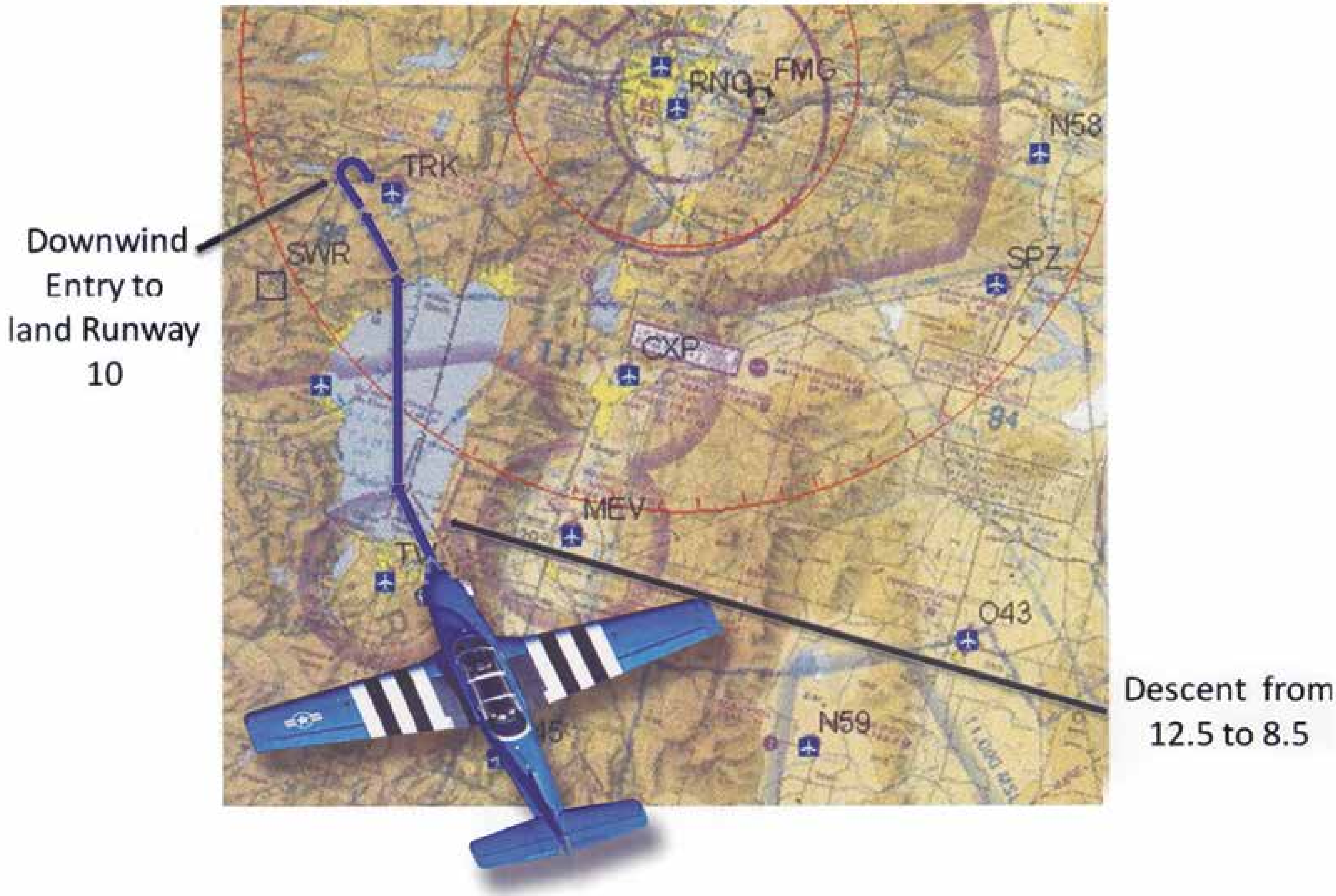
An hour later, we were pointed toward Miramar. My copilot observed that our "turbo-wiener" was flying home with its tail between its legs. I probably would have laughed if I had not been so disgusted with myself, and the perpetual clown music that kept playing in my head – you all know the tune.

So how did we punt it so far into the bleachers?

We had completed a T-34 NATOPS brief in one of the squadron's training shops for the first leg of the flight to Bishop (KBIH). We had also discussed the possibility of extending the flight to Truckee (KTRK); we had planned to land in Bishop for fuel based on doing a low safe mission first. The low safe mission was not scheduled, so we would have enough fuel to reach Truckee. We based this decision on real-time winds and fuel consumption.

We had both flown into Truckee in the past and were familiar with the airfield. By extending our first leg of the flight, we were adding fuel to deal with any contingencies on our last two legs to airfields that I had not seen before. I had completed some collateral tasks and returned to my desk to have one last look at the TFRs, knowing there were some restrictions for the President's departure from Los Angeles. I had also checked NOTAMS for divert airfields from Bishop to Truckee in case I decided that extending the flight was appropriate.

We had departed Miramar at 0930 via the standard VFR departure to the east so we could remain well clear of the TFRs. After passing the eastern limit of San Diego's Class B, we turned north on course to Banning (KBNG), and started a slow climb to 10,500 feet. I turned down the UHF radio volume to a suitable level




for monitoring guard and selected the squadron base frequency on button 20. I was monitoring UNICOM and tower frequencies en route using the VHF radio and then pulled up a SOCAL frequency as we crossed between Banning and March AFB. I distinctly remember hearing SOCAL say that all TFRs had been lifted.

As we crossed into the high desert near Hesperia (L26), I was about to ask SOCAL for flight following when I realized that the controller would simply pass me off to Joshua Approach, so I switched over to monitor Joshua. I then checked Palmdale's automated surface observing system (ASOS) and subsequently monitored Palmdale Tower (KPMD) until turning northwest near General Fox (KWJF). I continued to toggle between ASOS/AWOS, tower, UNICOM frequencies, and Joshua Control as we headed toward Bishop. About 30 miles from the field, I did some fuel-burn calculations and determined that we had more than enough fuel to make Truckee. I decided to continue. We were transiting out of Joshua's airspace, and I was about to pull an Oakland center frequency from the onboard GPS when we saw birds flocking co-altitude abeam Mammoth Airport (KMMH). I climbed to 12,500 feet to avoid further encounters and became obsessed with keeping an eye out for more birds.

**WE CONTINUED TOWARD TRUCKEE** via suitable divert fields including Lee Vining (O24), Bridgeport (O57), and Alpine County (M45). Abeam Alpine County, I began to monitor Lake Tahoe ASOS (KTVL). Terrain between us and the field caused garbled reception of the ASOS, so I deselected squelch and turned up the volume to get the local altimeter. I also pulled a center frequency from the GPS and put it in the VHF backup. After getting the winds and altimeter for Lake Tahoe, I toggled to the center frequency and monitored it while inputting Truckee's AWOS frequency. I quickly toggled to listen to Truckee's AWOS.

I started a descent to 8,500 feet, deselected squelch, and turned up the volume again to clearly hear Truckee's AWOS. Leveling off, I put Truckee UNICOM into the backup and then toggled to it. I immediately heard traffic at Truckee landing runway 10. As we approached the north shore of the lake, I set up for about a seven-mile downwind entry for runway 10. I decelerated, configured and landed from a right base turn, making standard communication calls throughout the landing process. I never suspected that I might have tripped someone's commit criteria.

More than a few lessons learned came out of this trip.

Preflight planning: I allowed my heightened awareness of local TFRs to blind me to the possibility of more of them along the route of flight. The FAA's website has a user-friendly TFR page that includes a map function that I had used in the past. However, this time I fell into the trap of filtering TFRs by state. I filtered for California TFRs only, as I planned to check and brief NOTAMS/TFRs for our next leg after landing back in California. I failed to consider what was obvious in retrospect: Airspaces do not respect state boundaries, so filtering TFRs by state was not a good idea.

I checked NOTAMS for Truckee, but I failed to notice any mention of the TFR. While obscure, it was there staring me in the face when I checked after landing: an airspace NOTAM referencing FDC 2/9708. Also, my incorrect assumption that the President was returning from Los Angeles directly to D.C. created a misconception. I slipped further into it when I heard SOCAL's transmission saying that all TFRs had been lifted. We all have our specialized responsibilities in the chain of command, but as aviators and officers we should be aware of the movements of our Commander in Chief.

Communication: In the T-34, I've always emphasized visual lookout and energy management via altitude and/or airspeed to allow for engine-out glide to a suitable field as the priorities. I always made a point to use a "trust but verify" approach to ATC agencies.

The first leg of our route of flight made an IFR flight plan impracticable because of our meandering route to remain within range of suitable airfields. OPNAV clearly states that IFR flight plans will be used to reduce the risk of midair collisions, and VFR flight-following would have been an effective substitute. I had every intent to use it, but I allowed other habit patterns, centered on the above priorities and an information-pull mindset, to distract me from establishing two-way communications for flight-following. Had I established flight-following and gotten a discrete squawk from ATC, my route of flight, including landing at Truckee, would not have violated the restrictions of the TFR.

It is likely that any UHF guard calls were drowned out in our cockpit by the ASOS on VHF because of the relatively high volume set in our VHF. Neither of us heard any guard calls as we approached Truckee, but we had heard other guard calls en route. We subsequently heard more during our RTB when VHF volume was not turned up as high and the squelch was on.

As an aside, with the ability to wirelessly link GPS to a tablet via a portable antenna, the need to carry and sort through charts in the cockpit is effectively gone. Had I used a tablet system instead of the hard-copy sectionals that cluttered the cockpit, and any one of several subscription programs, I would not only have had my real-time position overlaid on a VFR sectional, but also a graphic representation of the TFR overlaid on the sectional itself. No system substitutes for preflight planning, but the cockpit efficiencies created by such a system are significant.

Crew coordination: I should have made better use of my co-pilot, a highly qualified aviator, whom I treated more like a passenger on that day. Had I delegated a portion of the pre-flight planning he would have been more engaged in the process. Also, I briefed the standard radio procedures, but I should have specifically assigned him the task of listening to UHF guard by keeping his volume high while I was either listening to or talking on VHF. With electrical command in the front cockpit, the volumes are about the only thing the back seat can control.

We are reliving the process over and over, and dealing with the administrative consequences, which are less than pleasant. The gut-wrenching guilt for skylining our command and the sting of shame from having our call signs supplanted by the pseudonyms Major Myopia and Captain Sandbag will stick with us for the rest of our lives.

Respectfully submitted by the VMFAT-101 safety department on behalf of the perps below, pending administrative resolution.

MAJOR MYOPIA AND CAPTAIN SANDBAG FLY FOR VMFAT-101.

# There's Time to Do it Right

**BY LT. MONICA MONDLOCH**

As a new PQM (pilot qualified in model) at my first fleet squadron, I was excited for my first nontraining flight. No grade card today, just a nice tour of Guam for a VIP and a few of our maintainers. The weather was fine, with just the usual pop-up showers. We planned to do a slow lap around the island, circling over important features relating to the future Marine Corps buildup. I was in the right seat with the controls. Our HAC and squadron maintenance officer was narrating the tour and working external comms in the left.

> ... I was stopped by our crew chief, who called, "Hey, we still have the doors open back here."

We toured the east and south coasts before heading to the naval magazine to view the infrastructure and landing zones (LZs).

Suddenly the call came, “Knightrider 06, base. Where are you?”

I rolled out to the north as the HAC answered; I had a good idea what would come next.

“06, base. We need you to buster home for a medevac.”

All right, my first call. I immediately started to pull collective to get altitude and airspeed, but I was stopped by our crew chief, who called, “Hey, we still have the doors open back here.”

“OK, I’ve got 85 knots. I’ll hold that,” I replied.

I concentrated on my airwork as the HAC started to coordinate with Agana International Tower, whose approach paths we would soon cross. I reached over to the operator control panel (OCP) to turn up the volume on base freguency, but inadvertently turned off the receive function on my side.

I was expected to hear the thud of the doors closing, but instead heard our second crewman say, “Hey, the passengers can’t get the door closed. I’m going to have to get in a gunners belt and do it.”

In the max-pax configuration, the only way for our crewmen to shut the door is to stand in the open doorway and reach back. It took some time to do this, because of the gunner’s belt and need to unstrap.

The first time I really thought about what this action entailed was when our crewman said, “Ma’am, I need you to hold it nice and stable right now.”

**MAYBE IT WAS A GOOD THING** that I had turned off base. I could now focus on maintaining a stable platform and avoiding traffic as we neared the approach paths for the international airport. I also had to watch for obstacles as we left the jungle and approached a populated area.

The door issue seemed to be taking forever, but I knew that hurrying the process or asking for updates would only hurt the situation. I didn’t want to step on an important message from base or tower. What was probably a minute seemed like an eternity.

Finally, the call came, “Door’s secured.”

I smoothly pushed the cyclic and pulled collective to max blast to buster home. I was ready for action.

I noticed the HAC was talking, but I couldn’t hear him. So I checked the OCP and realized I was not receiving base. As I was fixing that, I heard our crewman say, “Uh, are we going to be slowing down any time soon?”

Wait. What? What’s going on? I gave the HAC a confused look and he said, “The other bird is going to take the medevac.”

“Oh, OK. I’m slowing down and coming left to head back down the coast.”

False alarm. We continued the tour and the flight ended uneventfully about a half hour later.

Maybe this is the least exciting Approach article you’ve read, but that’s OK — you’re not reading a mishap report about how our crewman fell out of the helicopter trying to close the door in a hurry. Despite all the excitement of getting the call, despite the immediate surge of adrenaline and get-there-now-itis, the guys in the back did it right. They immediately brought up a critical safety issue and worked through it the right way, with no shortcuts. Yes, it took us about a minute to close the door. But a minute at 85 knots is not that much time lost. Even when bustering, there’s time to do it right.

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LT. MONDLOCH FLIES WITH HSC-25.

# Remember That Approach Article You Were Going to Write?


**1998-2001: VP-40, First fleet tour, NAS Whidbey Island, Wash.**
**2012-present: VP-5, Executive Officer, NAS Jacksonville, Fla.**

**BY CDR. MATT POTTENBURGH**

December 1998: It was my first deployment in my first fleet P-3 squadron, and I had just sewn Ltjg. bars on my flight suit. The six-month deployment included detachments to Misawa and Kadena Air Bases in Japan. However, as the United Nations' investigation into Iraq's development of chemical and biological weapons and missiles deteriorated, my crew found itself in the Arabian Gulf. We were augmenting our sister squadron for the kickoff of Operation Desert Fox.

We were flying a routine Strait of Hormuz transit and strike group escort when a storm cell that we were monitoring moved into our flight path. As the crew's new navigator-communicator, my immediate concern was confined maneuverability. As our radar operator provided vectors around the outlying portions of the cell, we felt light turbulence. As geographic standoffs increasingly restricted our ability to deviate, we would have to penetrate an outlying portion of the cell.

Over the PA, the patrol plane commander (PPC) called, "Set condition five." This call mandated that all crew members secure loose gear, return to their station and strap into their seats. Our crew's tactical coordinator (the TACCO is the senior naval flight officer) was at the radar operator's station assisting in the weather avoidance. As the TACCO walked forward to strap into his seat, turbulence from the cell caused the aircraft to drop 200 feet. Already strapped into my seat, I clearly remember looking up and seeing the TACCO pinned to the ceiling. Then, as quickly as he went up, he fell to the floor.

The noise outside the aircraft was deafening. I can only describe it as what it must sound like to be inside an old muscle car that is being sandblasted prior to a restoration. As quickly as the hailstorm came, it departed. We had no idea as to the extent of the damage from the hail, but the look on the lineman's face as we taxied said it all. Our TACCO needed numerous stitches in his scalp, and the brief hailstorm shredded the nose radome.


February 2012: Fourteen years later, I was in Pensacola, Fla., attending the Aviation Safety Command Course as part of my perspective executive officer (PXO) training track. Each PXO was provided a selection of the previous two years' worth of hazard reports (hazreps) specific to our type/model/series to review. This gave us the opportunity to analyze trends and to review hazreps that were missed since our department-head tours. What jumped off the page to me was the number of hazreps regarding weather-induced damage to aircraft and injuries. Our community had published eight such hazreps over the previous two years. All of them resulted in hail damage to one or more of the following: nose radome, wingtips, rudder cap, propellers, leading edge, taxi lights, strobe lights and various antennas. Damage to the nose radome was specified in seven of the eight hazreps. Two events resulted in personnel injury from the turbulence in, near or around a thunderstorm cell.

May 2012: During my first week as XO, the first thing I chopped was a hazrep where an aircrew experienced turbulence near a thunderstorm while transiting to NAS Jacksonville. While the in-flight technician (IFT) and the acoustic operator were setting condition five, the aircraft suddenly dropped 500 feet. The IFT's head hit the main-cabin-door ladder, which required stitches. This scenario was all too familiar to me.

I have now been XO for four months, and we are on deployment in Japan during typhoon season. Bad weather arrives on-station rapidly and unannounced on almost every mission. We just had an event where one of our aircrews had completed their tasking and was heading back to Kadena when a thunderstorm developed along their route. While avoiding the cell, the crew encountered a hailstorm. On postflight, they saw that the nose radome was damaged and could not be repaired on-station. A P-3C nose radome costs $38,703. If you damage a nose radome, you are guaranteed a hazrep. Add the cost of this damaged radome to the seven discussed above and we are nearing $310,000 in nose-radome repairs alone. If you add in other damage to the aircraft, you are most certainly guaranteed a Class C mishap.

It is important to note that our NATOPS states "the effects of thunderstorms, such as hail and turbulence, can extend as far as 20 miles from the cell." Adding credence to this statement, in a recent Federal Aviation Administration report that described their analysis of 1,740 weather-related accidents, personal injuries (ranging from fatal to minor) occurred in 1,715 of them. Turbulence was one of the largest contributing factors of personal injury. This was due to flight personnel and passengers not being strapped into their seats when the aircraft encountered turbulence. In short, turbulence equals injuries. For P-3 crews, setting condition five early could be the difference between a safe return home and landing with injured aircrew. Just because the PPC has not called for condition five to be set does not mean you shouldn't secure your lap belt.

When circumnavigating weather, strap in early and steer well clear of the developing cell. Your flight surgeon and material control officer will thank you.

I've contemplated writing an *Approach* article about my 1998 flight for several years, and it is long overdue. Mother Nature whispered to me during my PXO track, "Remember that Approach article you were going to write?" She has now spoken to me loud and clear given our recent hail and turbulence encounters.

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CDR. POTTENBURGH FLIES WITH VP-5.

# Pumping the Brakes

*We were a couple of hours into our KC-130J logistics run when we heard, "Whoop, whoop."*

**BY CAPT. REX BROOKS, USMC**

We looked down to see the flashing red annunciators that make your heart jump no matter how many times you've seen them before. The advisory, caution, and warning system (ACAWS) on head-down display (HDD) No. 2 displayed a "PROP 1 LO PITCH STOP FAIL" in bold red letters. Our KC-130J NATOPS says this implies a circuit failure that would allow the propeller to enter the ground or reverse range should primary propeller governing fail. Crew action directed by NATOPS in this situation is straightforward:

Pull engine FIRE handle.

Place ENGINE START switch to STOP.

Do not attempt a restart.

However, rather than prepare for an engine shutdown, my copilot casually pressed the annunciator switch light to silence the warning, as the crew chief nonchalantly noted that the ACAWS was erroneous. I nodded in agreement. Why were we so sure? For as long as anyone in our crew could remember, there has been a "read and initial" referring to an interim flight clearance addressing this very situation. The R&I states that if the crew performed a successful overspeed governor check on the propeller in question, and the power lever for that engine has remained in flight idle since the successful check (which it had in our case), then it is mechanically impossible for the low pitch stop to be in a failed state. In this situation you can disregard the ACAWS, and the NATOPS-directed crew action is unnecessary.

At this point, my crew had completed our in-range and approach checklists, and we were on radar vectors for the visual. Our mission was to drop off the 20 passengers, then make the three-hour flight back to home plate.

"Whoop, whoop," the same ACAWS sounded again. It was met with the same casual suppression. Again, the crew consensus was an erroneous indication. The ACAWS sounded again shortly thereafter, then again and again. The seeds of doubt began to grow and eventually blossomed.

The propeller is fine as long as the engine remains in flight idle, but what happens once we bring it into the ground range for landing? Will the aircraft be down for the count until a part gets flown or shipped out to us? My crew and I had more questions than answers, and in a text-book, normalization-of-deviance situation,


# The seeds of doubt began to grow and eventually blossomed.

we made a judgment-call that put our aircraft, ourselves, and most importantly our passengers, in jeopardy.

Here's some background.

Aircraft commander (AC): 814 hours in type, model, series (TMS), less than 30 hours as an aircraft commander.

Copilot: 852 hours in TMS, recently had progression to aircraft commander suspended for performance-related issues.

Crew chief: 786 hours in TMS, recently upgraded to CC2.

Loadmaster: 368 hours in TMS, extremely confident in his fellow crew members.

Two days before the event in question, the same AC, copilot, and crew chief were stranded 15 minutes from home base with a recurring propeller-overspeed, governor-test failure, which required a limp from the active runway to troubleshoot. NATOPS tells us that these tests are only required on the first flight of each day. However, as a community, we always make sure of a good test before each takeoff. We do this because pitch-control-unit (PCU) sensor faults are a common issue that routinely result in a "LO PITCH STOP FAIL" ACAWS. If we always ensure a good overspeed test before each takeoff, then we never have to shut down an engine for this ACAWS according to the interim flight clearance.

After calling maintenance control, we were told to try completely shutting down the aircraft, then attempting a fresh test — a reboot if you will. Rather than clobber the runway yet again for what may likely be another test failure, our crew decided to perform the test on the apron. While an overspeed-governor test requires the throttles to be in the flight range, doing engine runs near ramp space are not uncommon. The crew agreed that our prop wash would not pose a hazard to anyone or anything nearby. If the test failed, we would simply shut down in place. If it passed, we would leave the symmetrical power levers in flight idle and use reverse on the opposite engines, braking as necessary to control taxi speed.

We executed the plan, passed the test, and taxied from parking for takeoff. This procedure is patently nonstandard, yet, at the time, we felt it was a reasonable solution that allowed us to RTB without additional inconvenience to the airfield and ATC controllers. In hindsight, we were fortunate that an aborted takeoff was not required, considering the amount of brake energy required to control our taxi speed.

*We seek to squeeze efficiencies everywhere we can ... we squeezed too hard by rationalizing that a non-standard procedure which worked previously would work again, despite a different phase of flight.*

Now, back to our incident. The same AC, copilot, and crew chief were on final descent with a repetitive "PROP 1 LO PITCH STOP FAIL" warning. We didn't know if the aircraft would be hard down after we pulled the power lever into the ground range, but, we did know that having previously passed an overspeed governor test, it was good to go so long as it stayed in the flight range. We then made an extremely poor decision. Rather than follow standard NATOPS procedures, we decided that leaving the No. 1 and No. 4 engines in flight idle for the landing, taxi, passenger offload, and subsequent takeoff was a valid solution to our perceived problem. Just as before, we executed our plan.

The braking required during the landing rollout in conjunction with the braking during taxi to control taxi speed with two power levers in the flight range exceeded the braking capability of the aircraft. As we pulled to a stop, the loadmaster noted smoke from the brakes, which was confirmed by the lineman. After stopping the aircraft a brake fire was confirmed, and the crew did an emergency evacuation of the aircraft. No one was harmed, but all four brakes were destroyed.

Rather than accept that we didn't have all of the answers we needed in the few minutes before touchdown, we had charged forward with a decision that we believed would enable us to complete the mission and return home without having to inconvenience anyone. Well, it turns out that four seized brakes on a KC-130 three hours from home is quite inconvenient.

**AFTER READING THIS SCENARIO**, you might say this has get-home-itis written all over it. While that may have been a factor for some of my crew members, I felt differently. It was the drive to say "yes" when I should have said "no."

Marines are part of an organizational culture that pushes to do more with less. As our budgets and personnel are cut, our workload remains or grows. We search for a way to make things happen when others would assume impossibility. At its worst, the recurring theme is that requesting relief is a sign of weakness, incompetence or incapability. These conditions can result in exceeding the capability of the personnel and the aircraft. We seek to squeeze efficiencies everywhere we can. In this case, we squeezed too hard by rationalizing that a non-standard procedure which worked previously would work again, despite a different phase of flight. Our intention to be efficient resulted in damage and was ultimately inefficient.

Although the costs were below the mishap threshold, we walked away with lessons learned. I learned that we as leaders must have the will to say "no" even when those around us are happy to charge forward. I also learned that in the future I'll choose to pump the brakes when it's called for, but only if the throttles are in the ground range.

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CAPT. BROOKS FLIES WITH VMGR-252.

# Talk About It Later

BY LT. JARED WEDEL

As a nugget pilot, I had been in my first fleet squadron for a little more than two months. I had a total of about 150 hours in the E-2C with the CNS/ATM "glass" cockpit, but only about 40 hours with the squadron. Of those 40 hours, less than half had been flown at homefield because I had joined the squadron a few days before they left on a month-long detachment to NAS Fallon for Strike Fighter Advanced Readiness Program (SFARP). After returning to Point Mugu, we were conducting night field-carrier-landing practice (FCLP) to prepare for carrier qualifications. I was waiting at the LSO shack to hot switch into the aircraft that had just completed a set of practice landings.

After the hot switch, we taxied to the approach end of runway 21 and received takeoff clearance; direct entry into the downwind for runway 27 to enter the FCLP landing pattern. Upon rotation I noticed my rudder ball was slightly displaced to the right. I put in the correction to recenter the rudder ball, but had overcorrected. This started a slight pilot-induced oscillation with the rudders. Passing through 300 feet and approaching the shoreline, I began a climbing left turn to intercept downwind for runway 27, the only runway used for FCLP.

As is common in Southern California throughout the year, a marine layer had formed along the shoreline. It extended inland with a ceiling of 1,000 feet overhead the airfield, decreasing as you went further out to sea. Even if the ceiling that night was right at VMC, we were still covered under special VFR with minimums of 500 feet and one mile visibility per the OPNAVINST 3710.7U. Our tower will not release aircraft into the FCLP pattern unless weather is 700/2. We had the weather, even if only marginal, to conduct night FCLP.

In the turn I looked outside to determine my rollout on downwind, using the shoreline as ground gouge. I began to hit a few low-lying clouds as I climbed through 500 feet. I then passed through my level-off altitude of 600 feet. Leveling off at 700 feet, I continued to go in and out of the bottom of the cloud layer. I tried to maintain an outside scan versus going back to a strict instrument scan. I ended up using glimpses of the shoreline as an artificial horizon, as I descended to get below the cloud layer.

I made a comment to the carrier aircraft plane commander (CAPC), sitting in the right seat, that I was not feeling right and a little disoriented. What I saw outside, or thought I saw, was not matching up with my cockpit scan. Looking at the cockpit instruments, it looked like we were in a descending left hand turn, with the rudder-ball displacement completely to the right. The vertical-speed indicator (VSI) was showing 700-to-800-feet-per-minute down. The CAPC told me to try and stay with it, and fight through what we both recognized right away as spatial disorientation.

The radar altimeter (radalt), which was set at 450 feet for the approach turn, went off. This alerted us that we had descended more than 150 feet from the standard pattern altitude. We received a call from the LSO telling us to climb. We also got a call from the combat-information-center officer (CICO) in the back. The CAPC immediately took the controls as we reached 350 feet AGL in the descent. He turned the plane out to sea and climbed to 3,000 feet. At 3,000 feet, and well above the marine layer, I tried to get back my orientation. After a few minutes, I told CAPC that I felt back to normal, and he passed me the controls. We picked up vectors for an ILS approach and hopped back into the FCLP pattern for three more passes for the night.

Looking back at this flight, here are several points to emphasize. Maintain a solid instrument scan even when you are supposed to be in VFR conditions. This is especially critical at night with a low cloud layer and an absence of a true horizon. Taking off on runway 21 at Point Mugu has you heading right into the land-sea interface, where you go from a multitude of lights on shore to pitch black out to sea. Add in a low cloud layer and it is very easy for the brain to create an artificial horizon, in this case the shoreline.

Maintain good radalt discipline. It is common in the FCLP pattern to set 450 feet for the "90" position in the approach turn. The audible radalt tone was a new modification to our squadron aircraft, and as we descended through 450 feet, it served as an important safety tool.

Vertigo and spatial disorientation are two of the emergencies we brief before every flight. I usually brief that if I am the one flying that I will announce the vertigo/spatial-d situation and try to fight through it. If I can't fight through it, I will pass the controls to the copilot. Also, if we are below 5,000 feet AGL a one-challenge rule applies; if I am challenged on my actions once and I do not fix it, then the copilot will automatically take the controls. We can talk about it afterward.

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LT. WEDEL FLIES WITH VAW-117.

# Semper Paratus


**BY LCDR. JASON GELFAND, USCG**

Here's a professional tip: If you ever pass the controls to your flight-school student, and when the flight is over you walk over to the grass off the taxiway to sob uncontrollably, you were not ready to fly.

More than a decade ago, a friend called early in the morning and told me that a pilot I used to fly with in the Marines had been killed the night before in an aircraft mishap. Instead of accurately assessing my personal readiness and canceling my helicopter flights that day at NAS Whiting, I flew my instructional sorties. I was distracted by his death during the flights, and I didn't pay attention to my student, to my duties, or to anything related to flying. All I could think of was the pilot, his crew and his widow.

My copilot for this day's sorties was more of a "nopilot," as he had not yet earned his wings. His inexperience and my emotions were not a good combination. As I taxied in to park the aircraft, I realized that I had failed to complete the required items on the syllabus card. I knew it was because I was thinking about the mishap. That's when the horror of his death really hit me. We parked and I climbed out. I walked to the grass, sat down and sobbed.

As you become a leader and progressively more senior flyer, you have to consider two things. First, not only are you responsible for accurately assessing whether someone is ready to fly, but you have to be aware that some of the safety issues you're trying to detect in your student/aircrew can degrade your ability to self-assess when they're affecting you. Second, you must maintain an open and communicative safety atmosphere, otherwise their valuable input gets precluded because of your seniority and unit culture. Sometimes we need others to point out what we should see in ourselves, especially when we are not thinking clearly due to emotional distress or fatigue.

A couple of years ago at Camp Pendleton, during a flight brief for a section of Hueys, one of the senior instructor pilots was doing the desktop version of "touch-and-goes": he was nodding off. He had been burning the candle at both ends. With his department-head responsibilities, graduate school, and family life, he did not have enough time to take care of his needs. Foolishly, I went flying in this section. How irresponsible was that? He was an obvious hazard not only to his crew but to the crew of the other aircraft.

I should have taken him aside and respectfully explained that he was in no condition to go flying, especially in a section. Even a cursory examination of fatigue and human-performance research makes it clear: Flying tired is about as smart as driving drunk, and the more tired you are, the less able you are to accurately assess your own performance.

Back at NAS Whiting, I had a student who showed up to the brief looking like a zombie. I remember

him clearly, because he was my only student with the distinctive SEAL device on his nametag. As a former Huey guy, I had worked with SEALs in the fleet doing parachute drops, sniper shoots, fast-roping and rappelling. Therefore, I had at least some idea of what SEALs were trained to do, and I was certain that no matter how exhausted he was, this student would not cancel our training flight. In the SEAL community, that would be seen as quitting.

I asked him how much sleep he had the night before. He confessed that he had not really gotten any sleep because of his new baby. I told him that while I had the utmost respect for what he accomplished as a SEAL, flight school was not Basic Underwater Demolition/SEAL training, and he needed more sleep. I canceled our flight and sent him home for well-needed rest. He looked pleased, not only to be getting the sleep he needed but also for my professional respect for his prior service.

We often think of supervisors and aircraft commanders as the ones assessing readiness. But sometimes, if you set the right climate, the junior ranks in your crew might be the ones looking out for you and keeping you from making a mistake.

One day as I headed to the Huey for a preflight inspection, one of my crew chiefs noticed me walking with a painful limp. He immediately called me on it with a tone that said, "You're not seriously going to fly, are you?" In retrospect, I considered my crew chief's comment as a sort of "permission" to take care of myself, see the flight surgeon and come off the flight schedule. He had the situational awareness and assertiveness, coupled with the communications and leadership skills, to identify and resolve a hazard involving his aircraft commander.

More recently, I was scheduled for a standardization check flight the day after a Coast Guard aircraft crash. I had known the aircraft commander through four years at Aviation Training Center, Mobile. For three of those years, I had worked with him on a daily basis, so the news of the crash hit me painfully. I was in no shape to fly, but I didn't say anything to the operations officer or my instructor. I was in shock and not thinking clearly. Our commanding officer called a meeting in his office the first thing in the morning to discuss our unit's response to the news. Fortunately, the Ops O looked at me and said, "You're canceled." Maybe he could tell that I had been crying in my office a few minutes earlier — the puffy eyes are always a giveaway. I was relieved that someone had the awareness to know that I was not ready to fly.

I am somewhere in the middle of the pack in terms of how long it takes me to process the death of a friend. It took me a little less than a week to get back from this recent incident. Several things helped me speed the recovery process. My wife and her endless reserves of patience and compassion. A couple of friends at work who went out of their way to be supportive. Thoughtful consideration about how my departed friend would want his fellow helo flyers to carry on. I know others who are able to fly immediately after hearing bad news, that's just not me.

On the other end of the spectrum, one of my former teammates never fully recovered after the death of his close friend and mentor. Shortly after my first Marine Corps WestPac deployment, the senior crew chief from our Huey detachment was killed in an aircraft mishap. A year and a half later, I found myself again in predeployment work-ups with another crew chief from my first cruise. He had been a top performer, a skilled flyer who had saved my life once. However, his performance in the aircraft had fallen off dramatically since our first deployment. He was frequently jumpy, irritable, and obviously uncomfortable in the aircraft. After a post-maintenance, functional check flight during which he was far too concerned about relatively benign weather, I took him aside for a private conversation.

I asked him what the problem was. He replied that he was simply concerned about the weather. Sensing that there was a lot more to this story than the Southern California weather, I told him that in my opinion he had not yet fully come to terms with the death of his close friend. I could tell immediately by his nonverbal reaction that I was precisely on target. I had met a Navy flight psychologist only a few weeks before. I told the Sergeant that I could put him in touch with the psychologist if he wanted help. He got the help he needed, and although he didn't return to flying, he was a key leader on my second deployment. That postflight conversation with him remains one of my best moments in the Marine Corps. By being attentive and looking beyond performance symptoms, I helped another Marine cope with his grief. Together, we were able to resolve a human-factors problem.

I use the Federal Aviation Administration's illness-medication-stress-alcohol-fatigue-eating (IMSAFE) checklist during crew briefs, with good results. I ask how much sleep each crew member had that night. If it is a night flight, I usually ask how long each crew member has been awake. I recently had a copilot tell me that he only had about five hours of sleep, and that by the end of our second sortie, a night flight, he would have been awake for more than 16 hours. Because there was an opportunity for him to take a nap and mitigate the fatigue hazard before our night flight, I didn't need to have someone else to take his duty shift.

During another crew brief, a flight mechanic mentioned that he was coming off the midnight shift to the day shift, had only had three hours of sleep that night, and had not hoisted in more than 90 days. The combination of sleep deprivation, circadian-rhythm disruption, and lack of mission currency forced me to dismiss him from the flight and find a replacement. He seemed to understand my reasons and did not complain about it when I asked him what he thought. I was glad that one of our copilots witnessed the conversation and maybe learned something about being an aircraft commander. As the aircraft commander, I am the final quality-assurance check for all safety-of-flight issues. All the operational-risk-management (ORM) checklists and processes in the world will not save your crew if you fail to follow through.

Despite all of the mental conditioning and desensitizing that occurs throughout your military training, the loss of a friend in aviation will hit you hard. Your goal is semper paratus, but there will be times when you should not be flying. You may be quick to recover and get back in the aircraft, while someone who flies with you may need far more time.

You have to somehow reconcile the paradox of serving in the Armed Forces, where you are not supposed to be emotional, with the reality that sometimes, for good reason, you are. You must strive for enough self-awareness to know when you should not be flying, which is far easier said than done.

LCDR. JASON GELFAND FLIES WITH THE USCG GROUP/AIR STATION NORTH BEND, ORE.

# Bravo Zulu

## HT-18


Lieutenant Cory Fenton and Ens. Christopher Olander were on an early stage, contact-familiarization flight with HT-18 from NAS Whiting Field, Fla.

En route to Navy Outlying Field Pace, Lt. Fenton brought the twist grip of the TH-57B to flight idle to initiate a simulated engine failure at altitude for his student. Upon recognizing the simulated engine failure, Ens. Olander followed the NATOPS procedures, getting the aircraft in an autorotative profile to land at a suitable field.

At 400 feet AGL, Lt. Fenton assumed control of the aircraft in accordance with SOP for a power-off waveoff and return to a normal flight regime. As he brought the twist grip back to full open, he noticed the engine failed to respond and provide useful power. Lieutenant Fenton brought the twist grip to flight idle, then returned it to the full open position without any corresponding engine response.

Understanding the severity of the situation, Lt. Fenton focused on flying a full autorotation to an unprepared field. His quick assessment of the situation and adherence to squadron procedures enabled him to land with no injury to the aircrew or damage to the aircraft.

Lt. Cory Fenton and ENS. Christopher Olander.

## VR-1


A C-37B from VR-1 departed NSF Diego Garcia for NAF Atsugi, Japan. The aircraft was crewed by LCdrs Dave Ryno and Eric Brown, AWF1 Nichole Kirkpatrick and CS2 Jeremy Boortz. The passengers included a VIP and the accompanying staff.

During preflight, the aircrew obtained two weather briefs. Neither predicted convective activity. Even though we didn't see thunderstorms or spot any on radar, the aircraft was struck by lightning about 50 miles south of the airfield. A bright flash momentarily blinded the aircrew. They then heard the crack of thunder. The aircrew quickly regained sensory perception, and the only evident damage was the loss of the enhanced-vision system (EVS). They returned to base.

On the postflight inspection, the aircrew spotted a large hole on the starboard side of the nose cone. Squadron and contract maintenance, with support from VR-48, installed a new nose cone. The aircraft was returned to flight status. The passengers were able to continue to their destination.

Left to right: CS2 Jeremy Boortz, AWF1 Nichole Kirkpatrick, and LCdr. Eric Brown. LCdr. Dave Ryno is not pictured.


## TWO HORNETS SUSTAINED HAIL DAMAGE

on a cross-country event. The flight's mission commander gives the following assessment:

A synonym for "safety" is "combat readiness," and the squadron's combat readiness was degraded that day through time, money and effort. Furthermore, those hours and effort spent in completing the investigation and repairing damaged jets should be better utilized executing air to air tactics as our squadron presses through the intense strike fighter advanced readiness syllabus. –LCdr. Tory Hegrenes, VFA-213.